JETFIGHTER IV

PILOT HANDBOOK


JETFIGHTER IV
FORTRESS AMERICA

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TECHNICAL SUPPORT

Every effort has been made to make our products as compatible with current hardware as possible. However if you are experiencing problems with running of one of our titles you may contact our Technical Support staff in one of several ways:

Before contacting Technical Support, please be prepared. In order to assist you as efficiently as possible, we will need to know as much information about your computer and the problem as possible. If you can not provide the information in the check list below, then please contact your computer manufacturers technical support department before contacting Take 2 Interactive, otherwise we will be unable to solve your problem.

The information that we will require is as follows :

Contact Details
Your name, e-mail address, daytime telephone number or postal address.
If you are from outside the UK, please specify which country you are contacting us from and the language version of the game you are playing.

System Details
PC Brand Name and model
Processor speed and manufacturer
CD-ROM Drive speed and manufacturer
Total amount of system RAM
The make and model of your Video Card / 3D Accelerator together with amount of Video RAM
The make and model of your Sound Card
Mouse and driver information.

Please describe the circumstances, including any error messages, of your problem as clearly as possible.

NOTE : PLEASE DO NOT CONTACT TAKE 2'S TECHNICAL SUPPORT STAFF IN SEARCH OF GAME HINTS. They are neither permitted nor qualified to supply such information.

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INSTALLATION

Below is a list of computer equipment required to run *JetFighter IV*: Fortress America.

MINIMUM SYSTEM REQUIREMENTS:

Windows 95 / 98 operating system(s)

333MHz Processor

48 MB RAM

Direct X Compatible 4 MB 3D Accelerator

CD-ROM drive

500 MB Available Hard Drive Space

RECOMMENDED SYSTEM REQUIREMENTS:

400MHz Processor or better

64 MB RAM

Direct X Compatible 16 MB 3D Accelerator

RECOMMENDED FOR HIGH RESOLUTION TEXTURES:

128 MB RAM

1.2 Gig Available Hard Drive Space

The following peripherals are also supported by *JetFighter IV*:

Joysticks

Rudder pedals

Throttle controls

INSTALLATION

Before you install *JetFighter IV*, please be sure you have met all the computer system requirements listed above. If you are not sure that you have the correct equipment, you may want to ask your computer dealer.

Your *JetFighter IV* game should contain this Pilot Handbook and 2 game CD's.

INSTALLING THE GAME

1. Launch Microsoft Windows 95 / 98.

2. Open your CD-ROM drive. Place the *JetFighter IV*: Fortress America Disc 1 in the CD-ROM drive, then close the CD-ROM drive.

3. *JetFighter IV* is an "AutoPlay" CD which means that once you insert the CD into drive, the AutoPlay menu appears allowing you to Install the program. Select Install from the AutoPlay menu that appears then proceed to step 4.

- If AutoPlay is disabled on your computer, you will need to run the Install program manually.
- Double-click the "My Computer" icon on your desktop.
- Double-click your CD-ROM drive (usually the "D" drive)
- In the file list, find and double-click Autoplay.exe. Then click Install from the AutoPlay menu. The installation process will begin.

4. In order to proceed through the install, you must first agree with the License Agreement. Click YES to agree with the License Agreement and to continue the Install process.

5. Follow the on-screen instructions to install *JetFighter IV* to your hard drive.

6. *JetFighter IV* includes an optional CD-ROM of high-resolution scenery. If you have enough hard disk space, you can install this CD for improved visuals. You will be given the option of installing this disc after the installation of Disc 1 is complete. If you choose not to install the high-resolution scenery now, you can install it anytime later by simply inserting the CD.

Note: Be sure you meet the System Requirements before installing the high-resolution scenery files.

RUNNING JETFIGHTER IV

UNINSTALLING THE GAME

To uninstall *JetFighter IV* at any time, follow these simple instructions.

1. Click the Windows Start button.
2. Select Programs, *JetFighter IV*.
3. Select and click Uninstall *JetFighter IV*.
4. Follow the on screen instructions to uninstall the game.

You may also uninstall *JetFighter IV* by clicking UNINSTALL on the *JetFighter IV* AutoPlay Menu.

Note that the uninstall program will not delete files that you created, such as saved pilots or custom generated missions. You must delete the root** JetFighter IV **folder manually to remove these files from your hard drive..

RUNNING JETFIGHTER IV

After you have successfully installed the game, you will probably be eager to give it a try. Below is all you need to do in order to run the game. These examples are for people who installed *JetFighter IV* to the default drive and directory C:\Program Files\Mission*JetFighter IV*.

1. Launch MicroSoft Windows 95 / 98.
2. Place the *JetFighter IV* Disc 1 into your CD-ROM drive.
3. If AutoPlay is enabled, Windows will automatically detect the CD and the *JetFighter IV* AutoPlay menu will appear.
4. Click on the Play button in the AutoPlay menu.
5. If AutoPlay is disabled, click the Start Button. Then select Programs, *JetFighter IV*, then select and click *JetFighter IV*.

"METASTREAM"

JetFighter IV includes the Meta Stream plug in for enhanced viewing of the JetFighter IV website.

To install the plug in click the Start Menu then select Programs / JetFighter IV/Install MetaStream. Then visit the www.jetifghterIV.com to view the 3D Gallery

MAIN MENU

MAIN MENU / INSTANT ACTION

The first screen you will see is the *JetFighter IV*: Fortress America Main Menu. Several categories are available from this menu. Click on a category to proceed to more specific menus under that category.

INSTANT ACTION	Random Mission, Single Mission, Mission Generator and Free Flight
CAMPAIGN	Single Player Campaign and Training missions
MULTIPLAYER	Host or Join a Multiplayer game
DATABASE	View 3D models, Credits, Scenery, Intro and Latest Information
OPTIONS	Customize game play and tweak performance
EXIT	Quit *JetFighter IV* and exit to Windows

Note: In any menu, press the [Esc] key to go back to the previous screen. You can keep pressing the [Esc] key to return to the Main Menu.

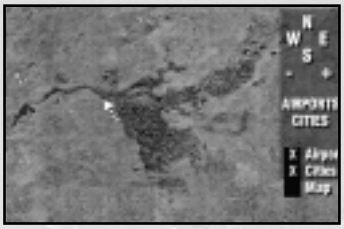
INSTANT ACTION

Instant Action is perfect for playing a favorite mission from the San Francisco Campaign, practicing maneuvers in Free Flight or generating a mission for some quick action before dinner. And, if you want a surprise select Random Mission to generate a unique mission on the fly.

MAP WINDOW

For nearly all game types, the Map Window is available on the Mission Select and Mission Briefing screens. The Map Window is useful for scanning the terrain before flying a mission.

The Map Window centers on the location where a mission begins. This could be a runway, the aircraft carrier, or a location above the terrain. You will notice that the Map changes as you cycle through different missions. This is because you are stationed at various locations throughout the campaigns.



MAP WINDOW CONTROLS

To easily scroll around the Map, simply left click and hold within the map view window. Drag the mouse to scroll the view.

You may also use the compass headings located on the right side of the Map Window to scroll around the map. Simply click on N, S, W or E to scroll the map in the desired direction. Use the + and - buttons to Zoom In and Zoom Out on the map, respectively. If your mouse has a wheel, you can use it to zoom in and out as well.

RANDOM MISSION

As the name implies, clicking Random Mission generates a random mission for you to fly. Simply click RANDOM MISSION and you are instantly transported into a newly generated mission. Note that you do not determine the parameters for the mission as in the Mission Generator. Random Missions begin in the air, so there is no need to take off or land.

SINGLE MISSION

SINGLE MISSION

The Single Mission option allows you to select any mission from the San Francisco Campaign and Training Missions, as well as missions created using the Mission Generator. Additionally, there is a group of Sightseeing Scenarios. These scenarios are just like Free Flight, but we've done the work of finding some nice "sightseeing" areas for you. Playing the Single Missions does not count toward or against your Campaign Game. Click SINGLE MISSION to proceed to the Mission Select screen.

Click the Left and Right Arrows at the top right of the screen to select the Campaign from which you wish to draw the missions. Campaigns include the San Francisco Campaign, Training Missions and Mission Generator missions.

Click on PREV MSN or NEXT MSN to cycle through the available missions in a campaign.

Click ABORT or press [Esc] to return to the Instant Action menu.

Click ACCEPT to proceed to the Mission Briefing screen after you've decided on a mission.

The Mission Briefing shows Intelligence information, the Commander's briefing and specific goals, in addition to showing a larger section of the map that the mission covers. To view INTEL, ORDERS, or GOALS, simply click on the appropriate word. Each time you click on the word, the text scroll will start over as well as the audio for each, if available - useful in case you miss something.

LOADOUT

Depending upon the type of mission you are about to fly, you will want to select the appropriate aircraft and arm it accordingly (bear in mind, different aircraft have different Loadout options). Clicking LOADOUT opens the Loadout Selection screen.

When in the Loadout screen, click on AIRCRAFT SELECT to choose the aircraft you wish to use for the mission. Click on WEAPONS SELECT to cycle through a selection of preset Loadout configurations. Click DONE to return to the Mission Select screen.

Click ABORT or press [Esc] to return to the Mission Select screen.

Click FLY to enter the mission.

DEBRIEFING SCREEN

When you've completed or exited out of the mission, you will see the Debriefing Screen. The Debriefing screen is full of mission statistics charting your performance. Use this screen to see where you are most effective and where you can improve. Click DONE to return to the Mission Select screen.

MISSION GENERATOR

MISSION GENERATOR

The Mission Generator allows you to quickly create and fly an action-oriented mission. Missions created with the Mission Generator are randomized, but you are in control of some basic settings that govern the overall make-up of the scenario. For example, you may choose to have an intense dogfight against overwhelming enemy forces, or attack a heavily defended ground target. The Mission Generator randomizes the scenario within the settings you choose. So, even if you leave the settings exactly the same, each time you press CREATE, the mission will be a little different. Click Mission Generator to enter the Mission Generation screen.

Use the Map Window to determine your starting point (latitude and longitude) on the map. Generated missions begin in the air, so there is no need to take off or land.

PARAMETERS

Left click to cycle forward through option. Right click to cycle back through option

MISSION TYPE: This determines the overall type of mission you will fly: Dogfights, Ground Target Attack, Ground Target Defense, etc. Depending upon the type of mission chosen, other options may become available. The Mission Type has the greatest overall impact on the mission that will be created. You should always choose the mission type first.

NUMBER OF WINGMEN: Select the number of wingmen that will follow you into battle. Adding more wingmen usually makes the mission easier to win. Remember, you can command the actions of your wingmen.

ENEMY AIR OPPOSITION: Choose a light, moderate, or heavy amount of enemy air opposition. Heavier air opposition increases the number of enemy aircraft you will encounter and makes the mission more difficult.

FRIENDLY AIR SUPPORT: Choose a light, moderate, or heavy amount of friendly air support. Adding more friendly air support increases the number of non-wingmen aircraft that will support you in your mission. You can't control their actions directly, but they will act on their own to help achieve the mission goal.

ENEMY SAM/AAA ACTIVITY LEVEL: This parameter determines how heavy enemy SAM and AAA is. The more activity, the more you need to pay attention to ground fire and the more friendly aircraft are likely to be shot down.

FRIENDLY SAM/AAA ACTIVITY LEVEL: This parameter determines how heavy friendly SAM and AAA is. The more activity, the more chance your friendly anti-air assets will destroy enemy aircraft.

OVERALL DIFFICULTY: This parameter allows you to choose the overall difficulty of the generated mission. It has a subtle impact on many factors that make up the mission, including how early the enemy can detect you, how many planes he will have and the number and types of weapons that enemy aircraft will carry.

CHOOSE AIRCRAFT: Choose from the F - 22 Raptor, F/A - 18 Hornet, or the F-14 Tomcat.

CHOOSE TIME OF DAY: Fly your mission in the morning, noon, or evening.

OTHER OPTIONS

ALLOW NETWORK FRIENDLIES: Check this box to allow other users to join your team.

ALLOW NETWORK ENEMIES: Check this box to allow other users to join your enemy and fight against you.

UNIFORM FORMATION: Checking this box will force all the aircraft in a formation to be of the same type.

CONCEAL MISSION GRAPHICS: If you'd prefer to have the mission be a total surprise, you can check this box to conceal the mission map window.

STARTING ALTITUDE: Click along the meter to determine your starting altitude. Generated missions begin in the air.

Click CREATE to generate your mission. You will see graphics appear in the Map Window, showing the locations of your mission goals. Each time you click CREATE, a new mission is generated from your parameters. If you don't like the layout of the mission, you can simply click CREATE again to generate a new scenario.

Note: You must click CREATE before you can click FLY.

CAMPAIGN

Click FLY to Take Off into your generated mission.

Click SAVE then type a name for your generated mission, then press [Enter], to save a generated mission.

This option is also available on the Mission Generator Debriefing screen.

Click EXIT or press [Esc] to returns to the Instant Action Menu.

DEBRIEFING SCREEN

The debriefing screen is essentially the same as the one for Single Missions, however, you have the added option of saving the mission if you found it particularly thrilling.

FREE FLIGHT

Free Flight allows you to pick any point in the terrain and fly around just for fun, without worrying about bandits or mission goals. Use the Free Flight option to practice maneuvers and enjoy the awesome scenery. Click Free Flight to enter the Free Flight Screen.

Use the Map Window to determine a starting point (latitude and longitude) on the map. Free Flight begins in the air, so there is no need to take off or land.

Determine your Altitude, Speed and Heading by clicking along the corresponding meter. You may also click and hold on the corresponding meter, then move your mouse left or right to decrease or increase your Altitude, Speed and Heading accordingly.

Click the FLY button to proceed into the Free Flight mission.

Click the EXIT button or press [Esc] to return to the Instant Action menu.

CAMPAIGN

This is the Single Player adventure where you must defend the United States against a vicious invasion from the Sino-Russian Coalition. The campaigns include Flight Training missions and the San Francisco Campaign missions. Click CAMPAIGN to begin the adventure.

You need to select a pilot in order to play through the campaign. The very first time you select CAMPAIGN, you are taken to the Create New Pilot screen.

Click in the name, callsign and taunt boxes, then type in your pilot and taunt information. Click out of the box to leave the information as typed.

Select a pilot portrait on the left side of the Create New Pilot screen. Click CHANGE PORTRAIT to cycle through all available pilot portraits until you find the one you like best.

Click DONE to enter the Campaign screen.

Select your pilot on the Campaign Screen. Click the NEXT and PREV buttons in the Pilot Window to cycle through available pilots. The information windows along the right side of the screen show what campaign and mission the pilot is currently flying.

Click NEW to go to the Create New Pilot screen and create another pilot. You can create multiple pilots, whose statistics and progression through the campaign are saved independently.

Click EDIT if you wish to change the selected pilot's information, such as name, callsign and taunts. Once inside the Edit Screen you also have the option of deleting a pilot by clicking DELETE PILOT. A confirmation prompt appears so you do not mistakenly delete a favorite pilot. Click DONE to return to the Campaign Screen.

MULTIPLAYER

Click CHANGE CAMPAIGN on the bottom left to switch between Flight Training missions and the San Francisco campaign missions. When in the Change Campaign screen, click on either mission group in the list on the right, then click ACCEPT. Click ABORT or press [Esc] to return to the Campaign Screen.

When you've decided on a pilot and a mission to fly, click FLY MISSION to proceed to the Mission Briefing screen. The Mission Briefing shows Intelligence information, the Commander's briefing and specific goals, in addition to showing a larger section of the map that the mission covers. To view INTEL, ORDERS, or GOALS, simply click on the appropriate word. Each time you click on the word, the text scroll will start over as well as the audio for each.

If you wish, use the Map Window to scan the area before taking off.

LOADOUT

Depending upon the type of mission you are about to fly, you will want to select the appropriate aircraft and arm it accordingly (bear in mind, different aircraft have different Loadout options and sometimes you will not be able to select your aircraft or weapons). Clicking LOADOUT opens the Loadout Selection screen.

When in the Loadout screen, click on AIRCRAFT SELECT to choose the aircraft you wish to use for the mission. Click on WEAPONS SELECT to cycle through a selection of preset Loadout configurations. Click DONE to return to the Mission Select screen.

Click ABORT or press [Esc] to return to the Mission Select screen.

Click FLY to enter the mission.

DEBRIEFING SCREEN

When you've completed or exited out of the mission, you will see the De-Briefing Screen. The De-Briefing screen is full of missions statistics charting your performance. Use this screen to see where you are most effective and where you can improve. Click DONE proceed to the next mission in the Campaign.

MULTIPLAYER

While the AI produces formidable opponents in *JetFighter IV*, you will find a greater challenge playing against other human opponents. For those who wish to test their skills against other desktop Aces, click Multiplayer on the Main Menu to venture into Human versus Human conflict.

CREATE A NETWORK GAME

To host a multiplayer game click CREATE A NETWORK GAME. This takes you to the Create Network Game screen. Here you can set up the Server Name and your player name by clicking in the appropriate box and typing the desired names.

To determine the Maximum Number of Players, click along the corresponding meter.

If you wish to make your game password protected (to avoid any unwanted Aces) simply click the check box next to PASSWORD REQUIRED. When toggled ON, you can then enter a Password in the password box. Simply click in this box and type the desired password.

Toggle ON the LOG GAME WITH MASTER SERVER option to make your game available to others on the Internet. By logging your game with the master server, you allow any other *JetFighter IV* user to see your server in his server list. If you only want people on your local area network to be able to join your game, then be sure this box is not checked.

When you are all set, click CREATE GAME.

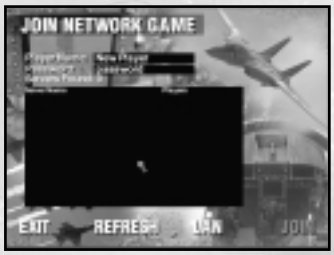
JOIN A NETWORK GAME

To join an existing multiplayer game click JOIN A NETWORK GAME. *JetFighter IV* will automatically begin searching the Internet for existing *JetFighter IV* games. If you prefer to look for games only on your local network, click the LAN button. To start a new search for Internet games, click REFRESH.

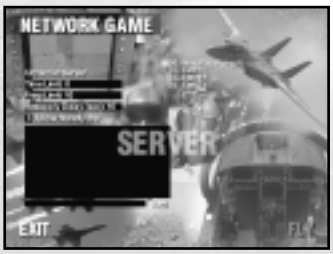
Scroll through the list of existing games and highlight the game you would like to join. Click JOIN GAME to join the server you have selected.

DATABASE

Once you have started or joined a game you will be taken to the "Lobby". The Lobby is where Hosts and Clients (those that join the games) meet up before taking off. Here, only the Host can change options such as Time Limit, Frag Limit and Resupply Delay, but all can voice their opinions in the chat window.



By clicking along the appropriate meter, the Host determines the Time Limit, Frag Limit and the Resupply Delay of the game.



Resupply Delay: For more intense Deathmatches, pressing [Shift-M] allows you to rearm your plane. The Resupply Delay sets the amount of time that must pass until players can use this function again.

Once all choices have been made, click FLY to enter the multiplayer mission.

DATABASE

The DATABASE contains many features to choose from, little extras to pass the time when taking a break in between missions. Clicking DATABASE takes you to the Database Screen.

OBJECT DATABASE

The OBJECT DATABASE allows you to view every model within the game. There are several controls available to see the 3D models used in *JetFighter IV* from every angle.

MODEL WINDOW: The MODEL WINDOW is the large box in the center of the screen where you see a model and its file name. Click and hold the mouse pointer over the model to move the model manually within the Object Viewer.

PREV and NEXT: Cycles back and forth between available 3D models.

ZOOM + / ZOOM - : Zoom in on the model to see the little details. Zoom out to view some of the larger models.

UP / DOWN: Moves the model up and down on the X axis.

LEFT / RIGHT: Moves the model left and right on the Y axis.

ROTATE: When clicked, the object slowing spins clockwise.

DONE: Returns you to the Database Information screen.

CREDITS

See who's behind all the action by clicking CREDITS. Press RESET to restart the credit scroll. Click DONE to return to the Database Screen.

LATEST INFORMATION

This option takes you to the *JetFighter IV* website, which reveals last minute information that did not make it into this Pilot Handbook. You may want to check this option every so often in case there are updates or new information.

REPLAY INTRO

To see the Intro, click REPLAY INTRO. Click anywhere in the window during the Intro scroll to return to the Main Menu.

OPTIONS

OPTIONS

JetFighter IV includes a wealth of options for customizing and "tweaking" your game in both personal preference and performance. These include options such as Sound/Music Volumes and Graphic Resolutions. You can also apply Cheats to the game, making it as easy or as challenging as you wish.

Clicking OPTIONS from the Main Menu takes you to the Options screen, where you can change almost anything in the game. For most options, simply click on the check box next to the option to toggle it ON or OFF. A check in the box means the option is enabled. An empty box means the option is disabled.

GRAPHICS

The Graphics Options are available for you to set the resolution of your game in addition to toggling ON and OFF certain graphic effects. Many players find it helpful to turn some graphic options OFF in order to increase the frame rates of their games.

- Clouds: This option turns clouds ON and OFF. When clouds are toggled OFF, your frame rate will improve.
- Sun Glare: When you look directly into the sun, the overwhelming amount of light affects your ability to see your surroundings. For enhanced realism, *JetFighter IV* includes this option. Toggling this option OFF is more of a minor adjustment and does not significantly increase frame rate.
- Redouts and Blackouts: Pulling maneuvers at great speeds causes blood to rush forcefully towards or away from the pilot's head. The "harder" the maneuver, the more likely a pilot is to have Redouts (blood rushing to the head) and Blackouts (blood rushing away from the head). Toggling these option OFF means you can pull off the most gut-wrenching maneuvers without the accompanying loss of consciousness.
- Look into Turns: Just as your head turns slightly when you turn in an automobile, your head turns as you bank in an aircraft. To have a steady view forward when banking, toggle this option OFF.
- Head G Effects: Given the speed at which your jet is moving, there is a significant amount of gravitational (or G) force applied to your body. Toggling Head G Effects ON causes your "virtual head" to move as you fly and pull maneuvers. Head G Effects are greater or lesser depending upon how fast you are moving and how hard you turn and pitch.
- On Screen Radar: Most players will want to play with the On Screen Radar toggled ON. This option shows a circular radar in the bottom left corner of the HUD and alerts you to enemy presence. Several radar ranges are available within the game to more accurately judge the enemy's distance.
- Autorange: Toggling Autorange ON will cause the On Screen Radar to automatically select a range that keeps the currently selected bandit in your radar.
- Sim Resolution: The Sim Resolution has the most direct effect on the performance of *JetFighter IV*. The lower the resolution setting is, the faster the frame rate will be. The higher the resolution setting is, the lower the frame rate will be. Of course, this also depends on what your system specifications are. Most newer computers with recent 3D graphic cards can run *JetFighter IV* in any resolution, without negative effects on performance. If you have lower-end hardware, you may want to keep the Sim Resolution low to have a quality and consistent frame rate.
- Model Textures Resolution: A few levels of Model Texture Resolution are available. Players who experience frame rate hits may want to select a lower resolution to speed up their game somewhat. Besides, even the lower resolution model textures are very clear and realistic. Users with less than 64 Megabytes of RAM may want to reduce the Model Textures Resolution.
- Hi-Res Terrain Textures: This option is for players with very high end computers. Even though the terrain textures are truly magnificent, there is an even higher terrain texture resolution available for players who wish to get the most out of their PCs. Click in the box to toggle the option ON and OFF. Of course, to see the Hi-Res Terrain Textures, you must have installed them from Disc 2.

SOUND

Click SOUND if you wish to alter the volume of Menu and in game sound effects, voices, and music. Additionally you can turn OFF in game sound effects all together.

To toggle Menu and In-game sound On and Off, check the appropriate box.

CHEATS

To change the volume of Menu and In-game sound effects, voices, and music simply click on the corresponding meter. You may also left click on a meter and hold while simultaneously moving the mouse left or right to decrease or increase volume.

JOYSTICK

The Joystick Screen allows you to map joystick buttons to various in game functions. Click JOYSTICK if you wish to customize your joystick controls.

NETWORK

In rare circumstances, some users may need to change the default port assignments for network games. Typically, this is not necessary. However, your network administrator may request that you change the default port to a new number.

CHEATS

A "Cheat" is a way of defying the "normal" rules in a game. Cheats are handy for the player whose skills in some areas are not yet developed, but they would still like to play without getting "wiped out." First time users benefit most from cheats, however, even the daredevil pilot practicing low altitude maneuvers has been known to use Cheats. For the most challenging game, we suggest you play *JetFighter IV* with all Cheats toggled OFF. However, Cheat options are available in order to make certain areas of the simulation easier to play.

- **INVULNERABLE:** Invulnerability is probably the most popular of all Cheats. With the INVULNERABLE cheat toggled ON, your plane can not be damaged by enemy air or ground weapons. We recommend this cheat only be used in extreme situations, e.g. you just can't seem to complete the mission on your own, and the other Cheats are not helping enough.
- **UNLIMITED AMMO:** UNLIMITED AMMO is another popular cheat and allows you to fire limitless amounts of missiles, bombs and cannon fire. With this cheat enabled, press [Shift-M] at any time during a mission to restock your ordnance. There is no limit to the number of times [SHIFT-M] can be used. If you find yourself in a no-win situation, we recommend you toggle UNLIMITED AMMO On, before turning Invulnerable ON. This cheat gives you an advantage without making you omnipotent.
- **UNLIMITED FUEL:** By default, your plane can only hold a certain amount of fuel and thus fly for a certain amount of time (as in real life). With UNLIMITED FUEL enabled ON, you will be able to re-fuel at any time by pressing [SHIFT-F] during a mission.

NOTE: Ordinarily, you would land at an airport or the carrier to re-arm or re-fuel.

- **EASY GUN HITS:** In the real world, using your cannons is not the easiest thing to do. Accuracy suffers due to a combination of high speed, turbulence and maneuvering. However, with the EASY GUN HITS toggled ON, your cannon fire will hit its mark with greater efficiency.
- **EASY LANDINGS:** If you would rather not worry about the more challenging and realistic landings, turn EASY LANDINGS ON to ease some of that worry.
- **NO GROUND CRASHES:** Turning NO GROUND CRASHES ON allows you to harmlessly dive into the earth without a scratch. Instead of exploding on contact, your plane "bounces" off of the ground.
- **NO COLLISIONS:** When bandits litter the skies and dog fights become intense, there is always the rare chance of colliding mid-air with another plane, be it friendly or enemy. Toggling ON NO COLLISIONS allows you to harmlessly fly through other mid-air objects.
- **NO DAMAGE EFFECTS:** When your plane takes damage, be it missile or gun fire, you will notice a decrease in the performance of your high tech jet. Toggling this option ON allows you to fly and take damage without negatively impacting the performance of your plane.
- **NO GROUND TURBULENCE:** When flying extremely low to the ground pilots notice a considerable amount of ground turbulence, making more difficult to control the plane at low altitudes. Toggling this option ON allows you to fly low to the ground without the negative effect on control.

THE STORY SO FAR...

PILOTS LOG

JANUARY 18, 2012: CVN GEORGE WASHINGTON

I heard reports early this morning that the Russians and Chinese signed a treaty. Looks like they are finally making a move to challenge the U.S. as a superpower. The North Koreans signed also. It seems they want to restore more regional power to places the U.S. protects. Some newscaster called it the "Sino-Russian Coalition," and I think that name is sticking. When it's all boiled down, the pact seems to encourage regional powers to be more aggressive. If you ask me, this treaty was made just to bust America's chops. Russia and China are just sick of being number two and want to take our number one slot. I'm not too worried right now. If things were really serious we'd already have our orders to ship out, so obviously the government doesn't want anybody bombed quite yet. Our C.O. says that this whole incident is just Russia and China puffing out their chests. As for Korea, he said North Korea would join with South Korea if it meant getting America out of its hair. He also told us that the Coalition has plans to perform joint naval exercises in the Pacific. Man I'd love to be out there for that, so I could see some of their new jets up close. Word around the GW is that they have some new planes that we haven't seen in combat. They're supposed to be fast and maneuverable. Still, our training will give us the edge. China's supposed to have a new carrier too... ugly bastard from what people say... but big. I was talking with some Seabees about it. They didn't seem impressed. According to them, once you've been on one carrier, you've been on them all; and I suppose they would know. These guys are trained by the Navy to go round fixing things on carriers while they are still out at sea. They get stationed all over the world until their job is done; then they get re-stationed and move on to the next job. At least us pilots get to stay on one boat for our tour. Walking around today, I guessed the reason the Seabees thought everything looked the same was because everywhere you turn there are bombs, torpedoes, and heavy guns. In one way, the whole thing is scary, and in another, it's comforting to know I'm that protected.

JANUARY 25, 2012

The news today was all about how China is interested in bringing Taiwan under its control. It figures. Those guys are always trying to screw something up. This is just their latest way to challenge U.S. defense agreements. The whole situation between America and China reminds me of two kids scrapping it up on the playground. Neither side is going to throw a punch, but both of them like to make faces at each. The rest of the world, however, seems to think that China is going to duke it out with us and that's causing problems. Reports are coming through the radio every day about "movement" in some trouble spots, but they never say what this "movement" is. Still, the C.O. tells us we should be on our toes, so I'm keeping prepared.

FEBRUARY 10, 2012

I've been so busy this week. I've barely had time to rest, much less write down my thoughts. First of all, we got a bunch of new pilots aboard the ship today and these guys are green, right out of flight school. The damn government doesn't think they have enough carriers to maintain world peace right now so they're making up for it with more pilots. And that's just what these carriers need-more pilots. There are already too many. This means that a lot of young guys are getting assigned to the ships too early. I can see it in their faces. They're just not ready.

Way I see it is, all these fresh-cuts on board have something to do with the uprising in Kashmir, where India and Pakistan are clashing again. Just when we thought that place settled down, somebody's got to start trouble. The rookies are fun to have around, though. They give the old GW a youthful flare. As a matter of fact, they don't even call it the GW like the rest of us, or the George Washington for that matter. They call it Old Wooden Teeth because they say the carrier's older than dirt. They joke around that she's probably made of wood and named after her first admiral. Those kids are funny, but I'm worried about how they'll act under pressure.

FEBRUARY 20, 2012

We lost two planes on Old Wooden Teeth this week and it couldn't have come at a worse time. On Monday, a few of the rookies were assigned to perform night launch and landing ops in heavy-loaded Hornets. Even I can't do this easily, much less some fresh face, and I've got a ton of hours logged. The whole crew has to be perfectly coordinated. On a normal land runway there is no problem with the added weight: you just get the plane up to speed and pull up. On a carrier though, it's different. You only have a football field's length to get up to speed, and if the cat pressure is not just right, you end up skimming the water. All it takes is one mistake from the crew and you end up ass-wet, and that's exactly what happened to that rookie on Monday. His butt skimmed the surf and the plane took a nosedive into the water. The poor kid suffered a concussion and a sprained wrist. I think his pride was hurt worse though. Had he not been so green, he would've known to punch out before wetting his wheels. As if that wasn't bad enough, on Wednesday another rookie trapped a landing way too early and much too hard. One of his rear

gears collapsed and smacked his right wing on the deck pretty hard. The pilot's fine, but I hate to see planes go down like that because I know what's going to happen next. These things are public relations nightmares. You can't just call the insurance adjuster to look at your $40 million Hornet! And even though nobody blames these two rookies for what happened, it still doesn't look good for us flyboys…especially since the Sino-Russian Coalition started military exercises today in the Pacific. It was all over the horn about how China was flaunting their new MiG-44's and S-37's. The 44 is Russia's latest design, and word is, they've sold quite a few of them to China. The CVN John C. Stenson was there on site, broadcasting coverage of the exercises to all the other U.S. carriers. Man o man, I've gotta say, those jets looked even better in the air than anything I ever read about them. I hope I get the chance to see one up close some day, just to show those Ruskies what a real pilot can do in the air. While we were all watching the broadcast, the sailor next to me told me that there were two Sino-Russian carriers in the water during the exercises and only one U.S. carrier. That is scary! I would hope that we would have more than one carrier to send over there. I mean we're the U.S. We hold the power. We should be able to flaunt it. Still, I'm worried if we only have one carrier available in the Pacific right now. That says a lot. This Coalition is trying to show that their military is just as strong as ours. That show of power is the kind of thing that could shake up the world. There is still no word about any of the air teams being shipped out, and I couldn't be happier. I've got leave in a couple months and I'm going home to see Mom and Dad. Even though they've sent me e-mail every week, I still miss seeing them. I definitely miss Mom's banana cream pie. If I think hard enough during the day, I swear that I can smell it. Then the fantasy's always ruined by the rancid stench of burning jet fuel or mess hall meals that seem to follow me everywhere I go on this boat.

MARCH 10, 2012

We just got the report an hour ago that ethnic cleansing has started back up in the Balkans. News like that assures me that I'm going to be deployed soon. I just don't know where. As much as I miss my Mom and Dad, I know I'm not going to get my leave to see them. There's just too much chaos around the world right now. I've never felt so trapped as I have this last week. Everywhere I turn there's a sailor or a pilot in my face, taking up my space and getting in my way. I try to escape by reading in my quarters, but my they are about the size of a prison cell and they feel like it too. Sometimes I go on deck to get a breath of fresh air, but there's nothing fresh about carrier air. It's always polluted with the smell of exhaust or the sound of roaring engines--not to mention flooded with activity. Flight coordinators and mechanics buzz around the deck like drones, directing or fixing aircraft, rolling them into position or dragging them to a parking spot on the upper decks. But in an hour I'll finally feel free because I get to fly; and I can't wait. Everyday, just the thought of being up in the air helps get me by. It's funny, up there, surrounded by metal and glass, crammed up against dials and levers, sitting in a cockpit barely the size of my body. It's the only time I don't feel claustrophobic. If it weren't for my time in the air, I couldn't stand the sight of this 1,052 ft metal island any more. At night I stay awake, listening to the damn thing creak and bend like it's going to spring a hole any second and sink. I couldn't bare to watch that happen. Losing that many planes would be awful.

MARCH 20, 2012

Now Indonesia's up at arms again. Early this morning reports came of random bombings in residential areas. It seems that all the hotspots that America settled down over the past twenty years are all exploding in our faces. It's gotta be because of that damned Sino-Russian Treaty. All of these outbursts started the day it was signed. Now I hear that the Sino-Ruskies are blocking the U.N. from stopping the violence in Indonesia and Yugoslavia. Basically, they're not allowing us to go in and bomb the hell out of them! I know it's not politically-correct, but I'm almost itching for some combat ops now. Not only do I think it may be our last resort for peace, but I could sure use some more time out of these cramped quarters and into a cramped cockpit! Maybe it's due to the tension that surrounds me or maybe it's the fact that the world is on fire. But every day I am becoming more irritable. Before, I used to love going up to CIS to watch the planes taking off and landing and now I just want to be in them, flying around. I flipped out on some rookie today because I saw him walking backwards on the runway. I screamed, "That's a good way to get your ass sucked in!" And he thanked me. He actually freaking thanked me. I guess he thought I was yelling over the noise and not at him. God, I felt like punching him, and I know I'm above physical fighting…especially with other pilots. Leave the bar fights to drunken sailors. I'll just go to my quarters to take a nap.

APRIL 29, 2012

Yesterday was a big day for the world. Iraq decided to lob a few mobile missiles over at Israel on Saddam Hussein's birthday. It was something they've done since the jerk died five years ago, so Israel was ready for it. Instead of blocking most of the missiles

and taking the rest on the chin like they usually do, last night Israel shot back, and it was ugly. They launched an intense, coordinated air strike that lasted for about 5 hours. And seeing as those are some of the best trained pilots in the world, they didn't miss much. I tell you, Israel lit up our infra-red cameras in Iraq like a funhouse strobe light. Now today-- all day--the leaders of the two countries have been making speeches on the radio and television, trying to rally their people to arms. Every time I listen to the international broadcasts, one of them is screaming at a crowd or making threats. All of it kind of makes me hope I get deployed to the Middle East because it looks like that's where the real action is.

What concerns me though, is that Israel hasn't consulted the U.S. once, before or after the retaliation. I think they've just given up hope in America helping them. There's talk around Old Wooden Teeth that the only reason the Israelis fired back is because they think we're losing our grip on the world. Well, so what if we are? We can get it back. We always have before. Still, there's nothing I can do about it. OWT is still stationed outside of the Virginia Capes and there's no action here. Man, I would kill to see some real action right now, just to get back in the air for something longer than a simple launch and landing drill. Those are getting really boring in my book. If all I wanted was to take off and land, I could have become a commercial pilot and made a hell of a lot more money! I even walked up to the CIS today to look at the main radar. There were only a few contacts on it. That's it. Two of the blips were our fighters and one was a commercial jet passing above the clouds. I tried to imagine what the radar would look like when it was swarming with action-bleeps and blips lighting up all over the screen until it was almost impossible to distinguish between enemy MiGs and our Tomcats. Then I imagined being up in a situation like that, fighting those new MiGs and S-37s and I started to drool. I actually started to drool for the opportunity to get into a dogfight or go on a bombing raid.

Speaking of bombing raids, we're expecting to get a powerful upgrade to our LANTIRN targeting system. I haven't seen the stats on it yet, but chances are that if I get deployed, I'll probably have to train on this new LANTIRN first. That's going to kick ass! This thing is supposed to be the best. Clearer, sharper and more accurate. This new system might be the only good thing that I've heard about since this damn Coalition was formed. If it's as good as everybody says it is, then it'll let us settle down these hotspots in Iraq and wherever else pretty quickly…

MAY 2, 2012

After Israel launched missiles at Iraq last week, Syria, Egypt, and Saudi Arabia pulled their ambassadors out of Israel and called for a U.N. resolution condemning Israel's actions. I think it's all crazy. Iraq can shoot missiles at Israel on the same date every year and nothing happens, but the second Israel shoots back, everybody makes a big stink about it. The real issue here is about faith. Israel doesn't have faith in American forces anymore. Neither does Iraq for that matter. We spent a decade bombing them every time they switched on a radar, and now they don't even seem to fear the U.S. or else none of this crap would be happening. Iraq wouldn't be violating U.N. resolutions and Israel wouldn't be firing missiles without consulting us first. It's like they're all challenging us and we haven't met the challenge yet. Do we even have any "friends" anymore? Really, the only thing the U.S. has done is refused to carry out an U.N. order condemning Israel for bombing Iraq. And I don't see why Israel should be condemned. They were just fed up and fighting back. Self defense. Now the entire Arab world thinks that the U.S. is supporting Israel because we refused the U.N. With all honesty, I don't even know if we are or aren't supporting them. I'm just a pilot. Somebody tells me who to bomb and when, and that's what I do. But so far no orders have come through yet. Our C.O. is constantly reminding us to prepare for the worst, and that means twice as many hours in the air, starting today. And today really sucks. The air outside is shrouded in such a dense fog that you can barely make out the lights on the deck. Not mention, the seas are up to six foot swells (not that you can feel it that much on a carrier). In weather like this, you have to fly by instruments. You live on a computer screen of crosshairs and lines, obeying your instincts, hoping they won't land you in the curl of one of those six foot waves. Our C.O. says that a day like this is perfect to brush up our skills on the old LANTIRN system. The new system, he says, will blow our current one out of the water. On a day like this, the new LANTIRN will illuminate the targets like they were in broad daylight. That's all fine and good, but I'm more worried about keeping my plane in the air than seeing what's on the ground. Well, I'm ordered to report on deck for a flight exercise. Keeping my fingers crossed, hoping that everything will go okay. In this kind of weather, anything can happen.

JUNE 6, 2012

"U.S. Intends to Defend Without U.N." The headline appeared so boldly on the front cover of the newspaper I could almost hear it. We're finally fighting back. The news said that America declared today that it will "defend its global interests and maintain peace without the U.N.'s approval, if necessary." But let's face it, America has never been a country to just sit back and watch.

We're the country that gets in the game and kicks ass. I think we're starting to prove that now.

On the post board today was a communiqué written by the Arabs and some other Third World countries. They threatened that America must get all of our forces out of the Middle East. I say screw them. How's that for gratitude. All these years, we've been busting our humps to secure that part of the world so they don't blow each other up and they have the audacity to tell us that we don't belong there! Man I hope I get a shot at some of them. I could really go for lighting up an Iraqi military base or outpost right about now. It's a sure bet now that I won't be getting any leave so I might as well take out my frustrations on the other side. It's a shame too, I was looking forward to seeing my family. I'm banking on one thing. I will definitely see some action, very soon.

JUNE 30, 2012

Well the pieces are moving into their respective places. Skipper ordered a satellite-radar printout that tells us where all the U.S. carrier are in the world. Then, after seeing the printout, he bitched the whole day that we only had seven carriers in the water and two headed for the boatyard. "We need twelve in the water to win this thing," he kept telling us. "Seven, or even eight, just isn't enough." When the printout was posted, I caught a glimpse of it just out of curiosity, and it looked to me like we had carriers all over the world. We've got two in the Arabian Sea, the Reagan and the Vinson, the Truman in the Mediterranean, the Stennis in the Western Pacific, and the Lincoln in the Indian Ocean. Old Wooden Teeth and the Roosevelt are up on the Atlantic side of North America and the Eisenhower is in the shipyard, undergoing a refuel and modernization. The only real problem I see is that our carriers are spread out all over the world, but that's what happens when you're the world's babysitter. You have to be everywhere at once. Before, at the end of the Cold War, nobody cared that we only had seven carriers. Now it's the topic of every conversation in the mess hall.

JULY 1, 2012

I knew it. One month before I was supposed to get my leave, I got assigned my orders. I'm to report to Fallon for training on the new LANTIRN system. I hope my family can wait. I'm just psyched to start training. I've wanted to use this new LANTIRN for some time now and I'll finally have the opportunity. I'm going to run down to the docs office right now to see if any of the new LANTIRN system manuals are available yet. Another positive for the day… I received a letter from Mom and Dad. They've seen all the trouble on the news and are afraid that I'll be shipped out. I wish I could tell them not to worry, but I can't. It just wouldn't sound right. "Hi Mom and Dad. I'm fine. There's nothing to worry about. Oh, and by the way, I'm getting shipped out tomorrow." I think I'll just tell them I love them instead.

AUGUST 2, 2012: FALLON

I haven't been able to write in a while because of all the activity. For the past couple months I've been preparing for my assignment, wherever that may be. I'm actually so good now that I no longer worry about taking off and landing on the carrier. As a matter of fact, when I landed at Fallon today, I thought it was too easy. I didn't have to snag an arrestor cable or stop in 200 feet. Honestly, I think I prefer flying off of a carrier now. It actually takes a bit of skill. I saw the new LANTIRN system on one of the jets in the field today. Just the look of it was so much more bad ass than the ones I've been working with. If these things play half as cool as they look, I'm going to be in for a real treat. Once I got acquainted with Fallon, news came that the Coalition now has four carrier groups throughout the Pacific. And all we have is the Stennis. These four carriers are constantly doing military exercises, and it looks like they're getting ready to do something big. If we don't get some more troops out to the Pacific soon, we could really be in for a world of hurt. Pretty soon it might be too late. And as much as I want to try out this new LANTIRN, I'm not really sure I want to be shipped out to the Western Pacific. The odds are overwhelming. They have roughly four planes to every one of ours. Even on my best day, I could only hope to beat two in the air, but I guess that's why I'm at Fallon for advanced training. They'll make sure we can handle anything.

AUGUST 5, 2012

It seems the focus of the world has shifted from China back to Iraq. The Arab country just blew the hell out of some Israeli cities and invaded Kuwait. Then, as expected, Israel fired back and declared war against Iraq. War! That word hasn't been uttered in twenty years. Now it's spreading like a virus, and the world is split on how to react. Some think that the Arabs should solve their own problems, and others think the U.N. should step in. Even the U.S. seems to be floundering. In the past month, the entire Middle East has disregarded the U.N. altogether. Even the U.S. has opposed it. Which begs the question, "What the hell is the U.N. there for anyway?" All of their decrees are being ignored, and nobody's afraid of their threats. Maybe because there's no one to carry them out.

The United States is still taking action, though. The President ordered the CVN Lincoln to move to the Arabian Sea to fix up the Middle East before things get out of hand. We seem to be running into all of this pretty blindly. The U.N. hasn't given its approval either. (Not like they've approved of anything we've done anyhow.) Anyway you look at it, this war in the Middle East is becoming daily headline news. A lot more than the war back in '91. The world is really starting to get stirred up. All morning, pilots and soldiers have been glued to the television, watching everything that happens at a snail's pace. Looking back, I'm sure it's all going to look like it happened over night.

The only good thing about all of this is that the Coalition hasn't responded to any of this crap in the Middle East yet. A lot of the guys think the Chinese are waiting to see how we respond before they make their move. I'm pretty eager to see that myself. It would beat sitting around here all day, wondering where I'm going to get shipped to next. Word has it that some of the countries think we're siding with Israel, but not even that's for sure. Everything here is on a need-to-know basis and not even the C.O.'s seem to know anything.

Orders blare over the loud speaker for us to fall out to the briefing room. Right now! Seems like everyday they tell us to concentrate on our training and to ignore the outside world. "You'll be out there soon enough," they constantly say. Dammit! I like to know the odds before I beat them.

AUGUST 8, 2012

For two weeks I've been here at Fallon and I still haven't gotten a chance to use the new targeting systems yet. All we've been doing is taking notes, listening to debriefings, and playing in the Sims. The simulators do, however, have the new LANTIRN plugged into them, and if they are as accurate as the Sim makes them out to be… God! I just wish I could be up there using it already. These things are so clear and accurate, I swear I could shoot out the tooth of a rat from a 40,000 feet. At night!

I heard another pilot talking in the hall today, and he said that we're going to get a chance in the air with the new LANTIRN this week. Needless to say, I'm ecstatic. Maybe it's the fact that I grew up on video game systems, or the fact that I've always wanted to fly, but I love being able to see my target below me, unaware of the danger lurking above him. I also love seeing the destruction my missiles and bombs leave behind when I'm through with a target.

There's a saying? Something like, things take time to create but can be destroyed in an instant. Whatever. Destruction is more fun. This truly is my darker side, I realize that. But with this new LANTIRN, all that will be possible

AUGUST 9, 2012

War! War! And more War! Today, Syria, Egypt, and Libya all declared war on Israel and formed the "New Arab League." This League was dumb enough to fly a plane past one of our carrier groups in the Mediterranean. Man, those ships turned that plane into scrap metal before the pilot knew what hit him. Now the U.N. is denouncing the U.S.' actions, but who are they to condemn us? From what I see, they haven't done anything at all to help us. If anyone, the U.N. seems to be helping the Sino-Russian Coalition. Everything they say, the U.N. supports. Now the Commies are telling us that regional powers must settle regional disputes. Then they ordered all of the American forces out of the Middle East immediately. What kind of horse crap is that? Even though they haven't said what they'll do if we don't move, it definitely won't be pretty. Seeing the world this screwed up makes me wonder if anybody has control of it anymore.

Tomorrow is the day I've been waiting for. I've finally received clearance to fly a bird with that new LANTIRN. After all these months, I'll get my chance to operate the most advanced night time, laser tracking and targeting device. With the way these tracking systems are advancing, pretty soon, I won't even have to pull the trigger or fly for that matter. But until then, I'm ready to get in the air and blow me up some bad guys.

Now it's my turn to take this crooked world and straighten it out!

COMMON PROCEDURES

One of the best ways to learn to fly *JetFighter IV* is to jump right in and give it a try. After all, it's a simulator, and there is fairly little chance of you getting hurt. This section of the manual lists some of the most common procedures that a JetFighter pilot must know in order to takeoff, fly, fight and land.

If you are already familiar with other flight simulators, this section will get you up and running in *JetFighter IV* very quickly.

If you are new to flight simulators, you can still use this section to experiment, but you may want to read more to understand some of the aviation concepts that are used here. Additionally, there are many more controls and options than you see listed in this section. Please refer to the Simulator Reference section of the manual for more detailed information

PLAYING SINGLE MISSIONS

PLAYING SINGLE MISSIONS

In *JetFighter IV*, you can embark on a campaign, or you can choose to fly a single, individual mission at a time. To choose a single mission, select Instant Action from the Main Menu. Then choose Single Mission from the Instant Action menu. Use the controls on the Single Mission screen to select the mission you want to fly.

CHOOSE THE CAMPAIGN

Missions are grouped into "campaigns". For example, the campaign called Training Missions contains 10 missions that will help you learn to play *JetFighter IV*. The campaign called Free Flight contains missions that can be used for casual sight-seeing. You can change the campaign by clicking the buttons next to the campaign name.

CHOOSE THE MISSION

Once you have selected a group of missions, use the Prev and Next buttons to cycle through the available missions. A short description of each mission will appear, along with a map of where the mission takes place.

RUN THE SIMULATOR

Once you have decided on a mission, you can select Fly to start the simulation, or Loadout to change your aircraft and weapons.

EXIT THE SIMULATOR

When you're done flying, you can press [Esc] and use the simulators menu to return to the Single Mission screen.

PLAYING A CAMPAIGN

In *JetFighter IV*, you can choose to fly a series of connected missions that form a story - or campaign. *JetFighter IV* includes two campaigns, the Training Missions, and Fortress America. If you're new to *JetFighter IV*, we strongly suggest you play through the training campaign first.

When playing a campaign, you will also need to create a pilot character. You can create many different pilots, and each one will separately maintain his progress through the campaigns.

CHOOSE YOUR PILOT

To start or continue a campaign, select Campaign from the Main Menu. At the Campaign screen, you will see the last pilot you were using. If this is your first time playing a campaign, you will be taken immediately to the New Pilot menu. Simply fill out the information and press Done to return to the Campaign screen.

You can change the current pilot by using the buttons next to the pilot portrait. The campaign in which the current pilot is flying will be displayed, along with the next mission to be flown.

GET YOUR ORDERS

When you're ready to continue, press [[ ]] to accept the mission. You will then be taken to the Briefing Screen where you will receive instructions. Pay attention... they may help save your life.

ARM YOUR AIRCRAFT

After receiving your orders, you may want to choose a different aircraft to fly, or customize the weapon loadout. You can do this by pressing the Loadout button.

FLY THE MISSION

Simply press Fly to run the simulator. Good luck, and watch your six!

ENDING A MISSION

A mission can end several ways...

- You can successfully complete the goal, and return for a landing. Your campaign statistics will be updated with your performance on this mission.
- You can complete the goal, but skip the landing by using the "Auto Land" menu option from the in-flight menu. We added this feature because many people don't want to have to fly all the way back to base after completing the mission. Your campaign statistics will be updated just as if you had landed yourself. Note that you may miss some action by skipping your flight home!
- You can abort the mission without finishing it by selecting "Abort Mission" or "Exit Program". The mission will NOT be counted toward your campaign score.
- You may also crash, blow up, get shot down or otherwise come to an early demise! You will be given the option of resurrecting your character, but the mission may not look so good on your record!

TAKEOFFS

GROUND TAKEOFF

Taking off from the ground is quite easy. This short procedure will help get you up in the air quickly.

WEAPONS TO SAFE

Be sure that no weapon selected. This will prevent misfires and the accidental injuring of personnel on the ground. If necessary press [N] to disarm your weapons and enter NAV mode.

TAXIING

If you need to drive to the end of the runway, press [+] 5 times to bring your engines to 5% military thrust. Use the rudder keys [Z] and [X], to steer your aircraft. You can press [B] to engage the wheel brakes if you need to slow down. Pressing [B] again will release the wheel brakes. Drive to the end of the runway and align the aircraft pointing down the airstrip. If you need to turn around sharply, use the [-] key to slow to 1% military thrust and you will be able to turn in a tight circle.

POWER TO 90%

Bring the engines up to 90% thrust by pressing [9]. The aircraft will begin to roll down the runway. If you're not moving, you may have the wheel brakes engaged. Press [B] to release them. Use the rudder ([Z] and [X]) to stay in the middle of the runway.

TAKEOFF!

Watch the airspeed display on the left of the HUD. When it approaches 18 (180 knots) begin your takeoff "rotation". Gently pull back on the joystick or hold down the [Numpad 2] key. In just a moment you should be airborne! After you are a couple hundred feet in the air press [G] to raise your landing gear

CATAPULT LAUNCH

You don't "take-off" from an aircraft carrier, you LAUNCH! A catapult launch is even easier than a ground takeoff, and considerably more exciting. The following steps will lead you through a catapult assisted carrier launch.

WEAPONS TO SAFE

If necessary, press [N] to disarm weapons and enter NAV mode. Note that "NAV" appears in the lower left of the HUD.

FULL POWER!

After you receive the "ready for takeoff" message, press [0] to spool your engines up to 100% military thrust. Newer jet engines are so powerful that afterburners are not required for carrier launches.

HOLD ON!

Once your engines reach full power, press [B] to release your wheel brakes. This also signals the catapult to launch you forward. You should pull back on the stick (or press [Numpad 2]) to be sure to clear the deck once you are free of the catapult. The ride down the catapult may be a little bumpy!

FOLLOWING WAYPOINTS

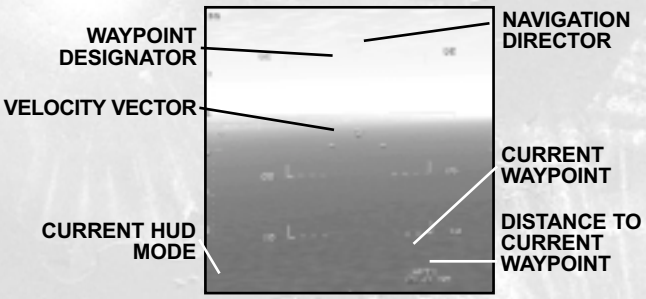
"CLEAN UP" THE AIRCRAFT

After clearing the deck, quickly raise your gear by pressing [G]. You can also decrease the throttle after gaining a little altitude. Of course, launching is the easy part. Eventually, you will have to go back and land on the carrier!

FOLLOWING WAYPOINTS

A waypoint is simply a position is space that a pilot may want to fly to. A waypoint could be a target, or it may represent a point at which you are supposed to rendezvous with another aircraft. Usually, however, a waypoint is a location at which you are supposed to turn to the next waypoint. These types of waypoints are called Navigation Turn Points or NTPs.

Waypoints are grouped together to create a flight-plan or course for your mission. They are usually designed to keep you out of danger until you reach the target area. By flying from one waypoint to the next, you can easily navigate your way through a mission.



Learning to follow waypoints is very important to flying the missions in *JetFighter IV*. Luckily, it is also VERY easy to do. This short procedure will walk you through flying from waypoint to waypoint. If you need a mission to experiment with, use the Single Mission menu and choose Mission #2: Waypoints from the Training Mission campaign.

SET UP NAVIGATION MODE

Before using waypoints, you need to put the HUD into Navigation mode so you can easily read the waypoint displays. Press [N] to disarm your weapons and enter NAV mode. You should see the letters NAV appear in the lower left of the HUD. In the lower right of the HUD you will see information about the current waypoint. Once in NAV mode, the [N] key is used to cycle through waypoints.

EXAMINE YOUR WAYPOINT LIST

Press [F7] to look at the right MFD. If necessary, press [F7] again until the waypoint list screen appears. This screen lists all the waypoints programmed into your aircraft for this mission. You can press [N] for the next and [Shift-N] for the previous waypoints. Each waypoint has a name, relative heading (bearing), and distance. After looking at the waypoints, press [Shift-N] until you are back at the first waypoint in the list.

DETERMINE THE DIRECTION TO THE WAYPOINT

Press [F1] to return to the normal forward view. At the top of the HUD is the heading display or "tape". Above the heading tape is a solid green triangle. This is the Navigation Director. It always indicates the direction to the currently selected waypoint. If the Navigation Director is left of center, you need to turn left. If it is right of center, you need to turn right. When the Navigation Director is centered, you are flying toward the next waypoint.

TURN TO THE CORRECT HEADING

Bank your aircraft left or right and continue to turn until the Navigation Director is centered in the top of the HUD. Level your wings. If the pointer drifts off center, you can use the rudder ([X] and [Z]) to yaw your aircraft and re-center it. You are now flying toward the waypoint.

FLY TO THE WAYPOINT DESIGNATOR

After you successfully turn towards the waypoint, you will see a green outlined triangle in the HUD. This is the Waypoint Designator; it shows you where the waypoint actually is in. You can now fly up or down to the correct altitude for the waypoint. Check the lower right area of the HUD to see your distance to the waypoint. This information is also in the navigation MFD accessed by pressing [F7].

AIR-TO-AIR COMBAT

INDEX TO THE NEXT WAYPOINT

When you get within 1 mile of the current waypoint, press [N] to choose the next waypoint in the list. As before, turn your aircraft to center the Navigation Director and fly to the next waypoint. That's all there is to it!

AUTOPILOT

There is an autopilot feature that will guide you through the waypoints in your NAV screen. The autopilot is very basic, so be sure to keep your eyes open to avoid rapid changes in the terrain!

To engage the autopilot, press [Shift-A]. The aircraft will begin to turn and fly toward the currently selected waypoint. You will see "autopilot" appear in the lower right of the screen. To disengage the autopilot, simply press [Shift-A] again. The autopilot will also automatically disengage if you change the waypoint with [N] or [Shift-N].

When the aircraft reaches the currently selected waypoint, the autopilot will select the next waypoint and fly to it. This process will continue until the autopilot is disengaged.

WARNING: Do not attempt to use the autopilot to land! This system is not designed for precision approaches.

AIR-TO-AIR COMBAT

When entering an air-combat environment, there are several helpful procedures you can follow to configure your aircraft properly and give you a better chance of surviving a dogfight. This list is a good quick reference to the functions you would normally perform to prepare for a dogfight.

"CLEAN-UP" YOUR AIRCRAFT

Before you enter a combat situation you should be sure to raise your gear [G], retract your speedbrake [B] and raise the arrestor hook [A] if, for some reason, any of these are extended. You want your aircraft to be able to achieve the best performance possible. You may even consider jettisoning any unused bombs and Mavericks. This will increase your ability to turn and accelerate rapidly. You can check the systems display by pressing [F8]. It details the conditions of your brake, gear and hook. This information also appears in the upper right of the HUD. If that area is clear, your aircraft is "clean".

EXAMINE THE SITUATION

WEAPON NAME	HUD ID	WHEN TO USE
M61A1	Cannon M61	target is 1 mile or closer
Aim-9	Sidewinder SW	target is 1-5 miles away
Aim-120	AMRAAM AM	target is

There are three ways to check the current "combat environment": The Radar [F6], the Map [M], and the on-screen radar [Alt-R]. Determine which targets are most threatening and which you can deal with later. The On-Screen radar [Alt-R] is particularly convenient because it is superimposed on the screen and you don't have to change 'views'. Symbols on the radar are color coded:

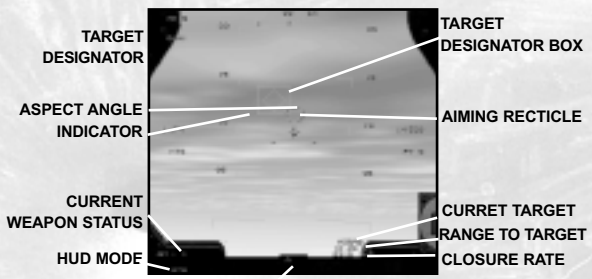
- GREEN - friendly
- RED - hostile
- WHITE - missile!
- BOLD - above your altitude
- BROWN - surface ship
- GREY - "spoofed" missile

SET IFF DISCRIMINATOR

Press [;] to cycle your IFF DISCRIMINATOR between All, Friendly and Hostile. This setting determines what types of objects are allowed to be targeted. Note the letter in the bottom center of the HUD. It will cycle between A, H and NH. You will probably want to set this to Hostile for most missions.

SELECT A WEAPON

Select an Air-to-Air weapon by pressing [Enter] to cycle forward and [Shift-Enter] to cycle backward through your weapons. Here is a simplified list of which weapon to try:



AIR-TO-GROUND: MAVERICKS

SELECT YOUR TARGET

Use one of the targeting controls to select a target. Press [T] to cycle through targets, or [U] to target the object directly ahead of you. [Y] will select the target closest to you. Remember, the IFF Discriminator determines which objects can be targeted.

CONFIGURE THE RADAR

Once you have selected a target, you can press [Ctrl][R] to put the radar into "autorange" mode. In "autorange" mode, the radar will automatically change range to keep your current target visible on the radar display. If you want to manually change range, press [R] and [Shift][R] to cycle through different ranges. This will automatically disable autoranging.

UNDERSTAND THE HUD

Once the HUD is in air-to-air mode, there are many symbols on the HUD which are vital to successful air combat. Here is a summary:

- The Target Designator box surrounds your target. If there is an X through it your target is a friendly! Don't Shoot!
- The Range Circle "fills up" clockwise as your target gets closer!
- The Target Information area in the lower right of the HUD lists the target type, distance and closure rate.
- The Weapon Information area in the lower left of the HUD lists the currently selected weapon type, the number remaining and the HUD mode.
- The target Aspect Angle Indicator lets you know what direction the enemy is headed. If the dot is on the bottom of circle, he is heading away from you… a great opportunity to fire a missile at him! See the reference section for more information on the Aspect Angle indicator.

AIR COMBAT MANEUVERING

Of course, this is the tricky part! Use the joystick, rudder and throttle to maneuver to get the best shot at your target. This is what it is ALL about! Here are some simple tips on a subject that really deserves volumes:

- In general, get BEHIND your target for the best shot. Use the Aspect Angle indicator to judge this.
- If you're flying too fast, you won't be able to turn rapidly enough. Try 90% military power [9].
- If you're flying too slow, you will loose your target. Worse yet, he may get behind you!
- Loose the sight… loose the fight. Keep your eye on the target!
- Watch for other Bandits behind you that you may have missed. Look at your radar often. Again, we recommend the on-screen radar [Alt-R].
- Watch for SAMs and other ground defenses when over enemy territory!

TACTICAL VIEW

Pressing [F9] will initiate Tactical View. In this mode, the computer will automatically "turn your head" to keep the currently selected target in view. You may find it helpful to keep the instrument panel visible ([P]) while in tactical view to help maintain your orientation. Press [F9] again to turn tactical view off.

LAUNCH WEAPONS!

Press the [Spacebar] to launch the currently selected weapon. You can press ["] to fire the cannon no matter what weapon is armed. You can press [F10] to get a "weapon's eye view" of the missile trying to seek the target. Press [F1] to return to the cockpit.

AIR-TO-GROUND: MAVERICKS

In many missions you will be asked to strike targets on the ground or at sea. There is a variety of weapons that can be used, including guided Maverick missiles. Mavericks will seek their targets automatically once released. You can even fire several missiles at several different targets, one after the other.

This procedure will get you to the target and show you how to attack it. Be sure you understand how to navigate to waypoints before attempting a ground strike.

GET TO THE TARGET

Follow your waypoints up to the target. Usually, your target will actually be listed as a waypoint. Sometimes, you may be attacking an "area", in which case you will need to press [T] to find your target.

SELECT MAVERICK MISSILES

Select an AGM-65 Maverick by pressing [Backspace] until "MAV" appears in the lower left of the HUD.

AIR-TO-GROUND: IRON BOMBS

SELECT THE TARGET

You should already have the target waypoint selected. If there are other pre-designated targets in the area, you may need to press [T] or [Shift-T] to select other targets. Notice the name and distance to target in the lower right of the HUD. You can also use the LANTIRN system to select targets for the Maverick. Read the section on LANTIRN Targeting below.

MAVERICKS AWAY!

The Maverick is the easiest air-to-ground weapon to use. This missile will seek the currently selected target. Just press [Spacebar] and the missile will be launched. Use [F10] for a spectacular missile view.

SPECIAL NOTE

Mavericks are "smart" weapons. They seek out the selected target under their own control. However they do not know about the contour of the terrain below them. A Maverick will NOT know to avoid a hill between you and the target. Be sure you have a clear "line of sight" before firing a Maverick.

AIR-TO-GROUND: IRON BOMBS

The Mk82 and Mk84 iron bombs require more skill than the Maverick missile because they are totally unguided. They simply fall to the ground. The CCIP system is designed to help you lay the bombs right on the target.

CCIP stands for Continuously Computed Impact Point and, just like it sounds, the system constantly calculates where your bomb will hit if you release it at any given moment. The CCIP takes into account your speed and orientation, as well as the contour of the terrain out in front of your aircraft.

The following procedure outlines arming a bomb, activating the CCIP system, and releasing your ordnance.

GET TO THE TARGET

Follow your waypoints up to the target. Once you are there, press [T] to select the desired target.

CHOOSE YOUR WEAPON

Press [Backspace] until Mk82 or Mk84 appears in the lower left of the HUD. You will also see CCIP indicating that the CCIP targeting system is activated.

CHOOSE THE TARGET

If your target is pre-designated, you will see the target designator box appear around the target. Check your range to target in the lower right of the HUD. You may need to press [T] or [Shift-T] to select nearby targets.

AIR-TO-GROUND: LASER GUIDED BOMBS

UNDERSTAND THE CCIP DISPLAY

After selecting the Mk82, the CCIP targeting system will activate. A line will be drawn from the center of the HUD down toward a circle. The point in the center of this circle is where your bombs will impact the ground. This is the "impact point". If the circle is below the HUD, this means the bomb will impact at a point you can't currently see.

MANEUVER FOR RELEASE

To use the CCIP system, you need to maneuver your aircraft until the "impact point" circle is over the target. This can be difficult at first. It is important to remember that when you release a bomb, air friction begins to slow the bomb's forward movement, so the impact point may be below and behind your aircraft. Nose down until the impact point appears in the HUD.

BOMBS AWAY!

When the impact point is over your target, press [Spacebar] to release a bomb. CCIP aiming is quite challenging, so please consult the Reference section if you are having trouble. There is also a training mission devoted to CCIP bombing.

WATCH FOR DEBRIS

If you were bombing from a very low altitude, you should accelerate and pull-up to avoid debris from the explosion. Also, you can be sure that the enemy will now have even more incentive to shoot you down, so watch your six!

AIR-TO-GROUND: LASER GUIDED BOMBS

The GBU-24 laser guided bomb has the ability to sense a laser reflection off a target and perform limited maneuvers in an attempt to score a direct hit. As you can imagine, using this system is much more accurate that using CCIP guided iron bombs.

GET TO THE TARGET

Follow your waypoints up to the target. Once you are there, press [T] to select the desired target.

CHOOSE YOUR WEAPON

Press [Backspace] until GBU-24 appears in the lower left of the HUD.

CHOOSE THE TARGET

If your target is pre-designated, you will see the target designator box appear around the target. Check your range to target in the lower right of the HUD. You may need to press [T] or [Shift][T] to select nearby targets.

UNDERSTAND THE RELEASE CUE DISPLAY

Since the GBU-24 can steer itself to the target, your most important concern is to release the bomb at the appropriate time. This window of opportunity is often called the "basket". As long as you drop your bomb "in the basket" the bomb should be able to glide to the target.

BOMBS AWAY!

When the release bar lines up with the tick mark, release the bomb. You may want to use the LANTIRN camera to zoom in and see the impact.

THE LANTIRN TARGETING SYSTEM

The LANTIRN targeting system uses a powerful camera and a computer controlled system that allows you to zoom-in on the ground and identify targets. It is perfect for use when you know to expect a target in a general area, but can't be assured of its precise location. It also helps you verify that the target you have been asked to attack is, indeed, what was expected by the mission planners. The LANTIRN system also includes a laser that "paints" the target so Mavericks and GBU-24 bombs can guide themselves properly.

Using the LANTIRN system takes a little practice. You're no longer only flying the aircraft, but positioning the LANTIRN camera and searching for targets all at the same time. The following procedure will give you an idea of what to expect.

PLOT YOUR COURSE

Typically the LANTIRN system is used when you know the general location of a target, but not its precise coordinates. For example, you may be ordered to destroy a tank park near Waypoint 4. Using the LANTIRN system, you can search for the targets near Waypoint 4 from a far distance away.

SEARCH FOR TARGETS

When you are about 15-20 miles from the target, you can use the LANTIRN system to start scanning the area. Press [L] to switch to LANTIRN view. Now, press [N] to cycle through waypoints until you have selected the waypoint where the targets are expected to be. Press [>] if you need to zoom in. Using the [[joystick]] you can now pan the LANTIRN camera around the terrain until you find your target. Once you have found your target, press [T] to select it. The LANTIRN system is now "locked on" to the target you chose. Press [L] to return to normal view.

LANDINGS

ARM YOUR WEAPON
Both Mavericks and GBU-24s can guide themselves toward the target selected with the LANTIRN system. Choose the weapon best suited for the target.

CONTINUE ON COURSE
Now, continue to fly toward the target. You may want to occasionally return to LANTIRN view to check your target. Some targets may be difficult to recognize from a far distance, so you may need to confirm your selection. Also, while the LANTIRN system can track moving targets, you need to be aware that your target may have moved behind a hill or other obstacle. Keep in mind, if the LANTIRN camera can't see the target, you can't attack it.

FINAL CHECK AND RELEASE
As you approach the target, make one final LANTIRN check to verify you have a "good" target. For Mavericks, you can fire when the IN RNG symbol appears. For GBU-24s, press the release button when the release marks line up.

TURN AND BURN
After release, you should perform an "egress turn" and get out of the area. The enemy will soon be very aware of your presence! Be sure the LANTIRN camera can keep the target in view, or your weapons may not track the laser properly.

WATCH THE FIREWORKS!
The LANTIRN camera is great for getting a close-up view of the action when your bombs hit!

GROUND LANDINGS
This procedure outlines the basics of landing at an airfield. There are several instruments and devices that can help you, including Waypoints, the Instrument Landing System and VASI lights.

Waypoints will lead you toward the runway and get you "lined up" for an approach. The Initial Approach Fix is a point about 10 miles away from the runway that is used to align your aircraft with the approach pattern.

FOLLOW YOUR WAYPOINTS
If you have waypoints programmed to take you back to a land base, follow them to the Initial Approach Fix (IAF) point. You should be at 6,000 feet when you reach the IAF. The proceed to the Final Approach Fix (FAF). See the procedure on Following Waypoints if you need more help.

FIND THE RUNWAY

APPROACH	FAR	NEAR
Correct	red	white
To High	white	white
Too Low	red	red

If you don't have waypoints programmed for the airport, you will need to make an initial pass to determine which runway you want and to verify there is no air traffic in the way.

FINAL DESCENT
At the FAF, or 3 miles from the runway, press [5] to slow to 50% military thrust. Lower your gear by pressing [G].

By watching the Velocity Vector symbol on the HUD, you can determine where your aircraft is headed. Gently pitch the aircraft up or down until the velocity vector symbol is on the near end of the runway.

ADJUST YOUR DESCENT RATE
On the left edge of most runways are VASI lights. These Visual Approach Slope Indicator lights provide a visual representation of your approach angle. One set of lights is on the near end of the runway, and the other is on the far end. Use these lights to adjust your altitude if necessary according to the following table:

You can remember this by the saying "Red - white... just right. Red - red, you're dead!" Fly down toward the runway keeping the correct approach angle.

TOUCHDOWN FLARE
As you pass over the runway, gently raise the nose of the aircraft by pulling back on the stick or pressing [Numpad 2]. Reduce power to 20% by pressing [2]. Let your aircraft "bleed off" airspeed. As you slow down, your aircraft will touch down on the runway.

COME TO A STOP
Press [1] to slow your engines to 10% thrust. Use the wheel brake [B] to stop your aircraft. You can shut off the engine by pressing [~].

CARRIER LANDINGS
Carrier landings are one of the most difficult jobs any pilot can face. *JetFighter IV*, has the most realistic and exciting carrier landings available for your computer. You will need to place your aircraft on a 400 foot landing strip that is moving, pitching and rolling out in the middle of the ocean.

If that sounds like a bit much, use the Cheat menu in the simulator and set Landings to EASY. We strongly recommend this for beginners.

FOLLOW WAYPOINTS TO INITIAL APPROACH FIX

Use the waypoint system ([N] and [Shift-N]) to fly to the Initial Approach Fix (IAF).. This is a point slightly behind the carrier. It will appear as "IAF" in the lower right of the HUD. Be sure you are at the correct altitude, and keep your power below 90%.

CONFIGURE FOR LANDING

At the Initial Approach Fix, lower your landing gear by pressing [G]. Lower the arrestor hook by pressing [A]. Press [N] to select the next waypoint, FAF or Final Approach Fix.

FLY TO FINAL APPROACH

Press [5] to slow to 50% military power. As you fly to the Final Approach Fix, notice the dotted bars that have appeared in the HUD. This is the ILS system and it will help guide you to a successful landing. Once you reach the Final Approach Fix, you should press [N] to select the final waypoint, CVN.

IN THE GROOVE

Slow to 40% power by pressing [4]. During final approach, you should pay attention to the ILS bars and the velocity vector. Keep the velocity vector on the stern of the carrier. Keep the ILS bars centered in the HUD. At 100 yards from the carrier, the ILS display will disappear to give you a clear view of the deck.

POWER UP!

Just as you pass the stern of the carrier, press [0] to bring your engines up to 100% thrust. Carrier pilots do this as a life saving precaution. If the arrestor hook misses the 4 cables, you will need enough thrust to "bolter", or take off again, in order to come around for another pass.

MULTIPLAYER

If you're ready to pit your abilities against other fighter jocks out in cyberspace, you can start or join a multiplayer game easily in *JetFighter IV*. Built-in features allow you to find active games, and make your game available to for others to play. To start or join a multiplayer game, first choose Multiplayer from the Main Menu.

STARTING A GAME SERVER

To start a game, select Create A Network Game from the Multiplayer Menu. You will need to name your game, choose the number of players you want to allow, and optionally supply a password. You can also choose whether or not to make your game available to the entire Internet, or just your local network. After making your selections, press Create Game to start your game server.

JOINING A GAME SERVER

To join an existing game, select Join Network Game from the Multiplayer Menu. *JetFighter IV* will automatically begin searching the Internet for existing *JetFighter IV* games. If you prefer to look for games only on your local network, you can press the Lan button. To start a new search for Internet games, press Refresh.

You can scroll through the list of existing games and highlight the game you would like to join. Press Join Game to join the server you have selected.

THE LOBBY

Once you have started or joined a game you will be taken to the "lobby". In the lobby, you can chat with other players and decide what settings you would like to choose. Only the player that started the game can actually change the game's settings, by all players can voice their opinions!

Once all choices have been made, press Fly to enter the mission.

TRAINING MISSIONS

INTRODUCTION

Welcome to flight school! *JetFighter IV* includes a set of flight lessons that are a great way to learn to fly the simulator. If you have never flown a flight simulator before, we strongly recommend you start here. The lessons are designed to get you up and flying in no time. In fact, your first lesson begins in the air above the mountains near Yosemite National Park. Your main objectives are to get a feel for the aircraft and enjoy the scenery!

Each lesson is intended for use in conjunction with the step-by-step manual instructions following the Flight Training Introduction. There are a total of eleven lessons in *JetFighter IV*:

1. Basic Flying Skills
2. Runway Takeoff and Waypoint Navigation
3. Follow the Leader
4. Air-to-Air Weapons Training
5. Carrier Catapult Launches and Wingman Commands
6. Runway Landing and ILS Training
7. Daytime Carrier Landings
8. Air-to-Ground Attacks with Mavericks
9. Air-to-Ground Attacks with Unguided Munitions
10. Air Combat Maneuvering
11. Nighttime Carrier Landings

Don't worry, these lessons won't be boring! In fact, it might seem like events occur too quickly to follow the steps in this manual. Tailor the speed at which you progress through the lessons by pausing or restarting them as often as necessary. Press [Ctrl-P] to pause the game if you need to catch up. When you are ready to resume flight, press [Ctrl-P] again. To restart lessons, first press [Alt-X], then select the restart [R] option.

Have fun! You'll be bombing targets and winning dogfights in no time!

You can work through the training missions two different ways, as a Campaign, or individually. A campaign is simply a set of missions that link together. All of the flight lessons are linked together into a campaign called "Flight Training." See the section titled "Common Procedures" for detailed information on how to fly

RUNNING THE TRAINING MISSIONS

missions individually or as a campaign. For now, we will assume you want to fly the entire training campaign. From the main menu, select "Campaign". If you haven't already created a new pilot, you will be prompted to do so. Go ahead and fill out the pilot registration and press "Done" when complete.

New pilots automatically start in the training campaign, so you should be ready to go. On the campaign screen you will see the name of the next mission to be flown, and a short description. Press "Fly Mission" to continue to the briefing. Each mission contains a briefing that outlines the goals for the flight. The Training missions refer you to this manual, so keep it open while you fly. When ready, press "Fly" to start your mission.

After finishing each mission, you will be returned to the Campaign screen and be given to opportunity to continue on. Keep working through the training missions, or press "Abort" to exit back to the main menu.

LESSON #1: BASIC FLYING SKILLS

This lesson will give you a chance to get a "feel" for flying in *JetFighter IV* and enjoy the scenery. In addition to some basic flight maneuvers, the following steps introduce some simple aerodynamics that will help you better understand and fly your aircraft.

Before beginning you should be familiar with two important terms: stall and velocity vector. Once you begin flying you will see the velocity vector near the center of the Head's Up Display (HUD). It appears as a small circle with three small protruding lines. This symbol depicts a "vector' extending along your FLIGHT PATH. The difference between where your aircraft is pointing and your actual flight path is subtle, but important. Looking forward through the HUD simply shows the direction the aircraft's nose is pointed. Your flight path is the direction you are actually traveling. The direction of the aircraft's nose and its flight path are not necessarily the same. For example, at a low airspeed, you may point the aircraft's nose up so you see mostly blue sky and little ground. Although it may "appear" you are climbing, in reality you are descending. The wings inefficiency at low airspeeds explains this illusion. The velocity vector is most useful for navigating to an exact location. Orient the aircraft so the velocity vector is on top of your destination (i.e. a mountain peak or the carrier deck). Keeping the velocity vector on the same point ensures you will eventually reach your destination.

While flying, you may stall the aircraft. An aircraft stalls when the smooth airflow over the wings becomes disrupted and the wings can no longer produce enough lift to maintain flight. Most commonly, stalls result from an excessively low airspeed. A horn and cockpit panel message warns you of an imminent stall. To remedy the situation, pitch down (toward the ground) and/or increase the power to about 80% [8]. Don't pitch down more than 5° below the horizon. Press [Num 8] or push the joystick forward to pitch down.

This lesson is very open ended. When it starts, you will be flying over a mountain range near Yosemite National Park in California. Your throttle will be set at 92% thrust as indicated in the upper left corner of your Heads Up Display (HUD).

LESSON #1 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Esc]	Opens/Closes the In-Flight menu
[®] [] [√] [Ý]	Move within the In-Flight menu
[Alt-A]	Toggle altimeter between MSUAGL modes
[0] - [9]	Adjusts power (in 10% increments)
[Alt-L]	Toggles Pitch Ladder on/off
[Num 4]	Roll left
[Num 6]	Roll right
[Num 8]	Pitch up
[Num 2]	Pitch down
[Z] or [Num 0]	Left Rudder
[X] or [Num Enter]	Right Rudder

Completion Requirements: Fly around for at least six minutes practicing the maneuvers outlined below.

1. Once you are flying turn on the "No Crashes" option in the "Cheats" menu. Press [Esc] to bring up the In-Flight menu. The simulator pauses whenever you use the In-Flight menu. Press [®] several times until the "cheats" heading is highlighted. Press [Ý] to open the cheats menu. Press [Ý] several more times until you get to the "No Ground Crashes" option. Press [Enter] until "YES" appears next to "No Ground Crashes." This allows you to "bounce" off the ground instead of crashing into it!

2. Press [Esc] several times to return to flight mode.

3. Notice the altitude indicator on the HUD's right side. This "tape" displays your Altitude in thousands of feet.

4. Adjust your altimeter to display Mean Sea Level (MSL) instead of Above Ground Level (AGL) altitude by pressing [Alt-A]. (The reference section describes the difference between MSL and AGL altitude.) [Alt-A] toggles between the letters "S" and "G," which refer to MSL and AGL, on your altitude tape. Set the altimeter to "S." The altimeter should read about 21.5 (21,500 feet).

5. Press [0] to bring the engine up to 100% thrust. Watch the indicator in the upper left corner of the HUD increase to 100%.

6. Activate the "pitch ladder" by pressing [L]. Use the pitch ladder to establish consistent pitch and bank angles during climbs and turns. Steady pitch and bank angles yield smooth flight.

RUNNING THE TRAINING MISSIONS

7. Perform a climb by applying some "back pressure" on the joystick (or press [Num 2] until the horizon is in the lower third of your screen. Applying back pressure actuates a primary flight control called the elevator. The elevator is attached to tail of your plane and affects your pitch. Pitch is the rotation about an aircraft's lateral axis--the axis that extends from wing tip to wing tip. As you apply back pressure the horizon to appears to "drop" in your screen. This is called "increasing your pitch" or simply "pitching up." Be sure to keep the horizon in view since it provides important orientation queues. Once you've adjusted your pitch, release the joystick (or release [Num 8].)

8. USE A LIGHT TOUCH ON THE CONTROLS. Take it nice and slow; make small and smooth movements. Resist the urge to jerk the stick around. Save that for combat!

9. Notice your airspeed decrease as you climb. Deceleration occurs for the same reason a car slows down when it goes up a hill.

10. Climb until the altimeter reads 25.0 (25,000 feet). Remember the altimeter is the "tape" on the right side of the HUD.

11. Keep an eye on your pitch and altimeter to avoid excessive climbs. Beginners tend to climb continuously or too steeply.

12. As your climb approaches 25,000 feet, apply some forward pressure on the joystick, or press [Num 8], until you are level again. Again, remember to do this BEFORE you reach 25,000 feet since the plane will continue to climb as you level-off. Pilots refer to this as "leading you altitude."

13. Add some forward pressure on the joystick, or press [Num 8], to initiate a descent. Pitch down until the horizon is in the upper third of your screen. Again, don't over control the aircraft.

14. Move the joystick left, or press [Num 4], to turn the aircraft left. This affects the ailerons--a primary flight control governing roll. Roll is the rotation of the aircraft about its longitudinal axis--the axis extending from the aircraft's nose to its tail.

15. After you roll about 30 degrees from level, release the joystick allowing it to re-center (release the [Num 4] key). You will stay in a nice, easy bank.

16. Look at the strip of numbers along the top of the HUD. This indicator or "tape" shows your heading. The numbers will be sliding to the right and getting smaller. 27 means 270 degrees (west), 18 means 180 degrees (south) and so on.

17. You may notice a slow altitude loss. In rolling, you redirected the wings lift. This renders the wings less effective in opposing gravity; an altitude loss results. To perform a level turn, apply a small amount of back pressure on the joystick (or momentarily press [Num 2] as your roll angle increases.

18. Move the joystick to the right, or press [Num 6], and level your wings. Release the stick slightly BEFORE you return to level, as the aircraft will continue to roll while you center the controls.

19. The rudder is another primary flight control that adjusts your heading. Rudder controls an aircraft's yaw. Yaw is the rotation of the aircraft about its vertical axis. Think of this as a "flat" heading change; the aircraft changes heading without rolling. Pilots usually coordinate the use of rudder and aileron to initiate bank when they want to turn the aircraft. In a coordinated bank turn, roll and yaw (ailerons and rudder) work together to turn the aircraft. The rudder is also useful for "fine tuning" your heading--making small changes without rolling. [Z] and [X] control left and right rudder respectively.

20. Turn to a heading of EXACTLY north (00 on the heading tape). This time, bank the aircraft using right aileron (right joystick or [Num 6] and right rudder [X]). Again, use only a 30° bank angle (30° from level flight). The rudder causes your heading to change more quickly--a useful tactic in dog-fights!

21. As your heading approaches 00, release the rudder and roll your wings level by moving the joystick to the left (or pressing [Num 4]. Remember to lead your heading upon roll-out since your heading will continue to change as you level your wings. Once level, use the rudder to "fine tune" your heading. Do this by pressing [Z] or [X] for left or right rudder.

22. With your wings level, maintain a constant altitude by adding forward or backward pressure on the joystick (or pressing [Num 8] or [Num 6]) until the altimeter stops moving, Reduce power to 40% by pressing [4]. In addition to slowing down, you will begin to loose altitude. Maintain a constant altitude by pitching up slightly. You are now in "slow flight."

23. Conversely, press [9] to increase your power to 90%. If you hold the same pitch, you will begin climbing. Maintaining your altitude while accelerating by slightly decreasing your pitch.

24. Once you are comfortable with shallow banks and climbs, try some steep maneuvers. Be careful though! A steep climb will result in a stall if your airspeed gets too slow.

25. While in a steep bank, pull back on the stick (move the joystick back or press [Num 2]). Watch your heading change much faster. This will come in handy during dog-fights!

26. Great! Now spend some time flying around. Don't worry, if you hit the ground. The "No Ground Crashes" option will bounce you back into the air. The most important point is to spend some time getting the feel for the aircraft.

27. When you are done, access the In-Flight menu by pressing [Esc]. Select the "Game" menu, then select "Auto Land" or "Return to Carrier" and press [Enter].

LESSON #2

LESSON #2: RUNWAY TAKEOFF AND WAYPOINT NAVIGATION

This lesson will teach you to safely take off from a land-based runway and navigate using waypoints. You begin on the runway at Mammoth June Lakes in California.

Waypoints are navigation aides that help you find your way from one location to the next. They play an integral role in each combat mission since they guide you to and from your target. In this lesson you will fly a series of waypoints that will take you on a tour of the area ending back at the airfield.

The HUD is in navigation mode as indicated by the abbreviation "NAV" near the HUD's lower left corner. The HUD's lower right corner shows information about the currently selected waypoint (i.e. WPT1). The solid triangle on the heading tape shows which direction you must turn to intercept the waypoint. This triangle is called the Navigation Director. Also, if the waypoint is roughly ahead of you, a hollow triangle appears in the HUD. This represents the actual waypoint and is called the waypoint designator. Fly toward the designator and you will eventually intercept the waypoint.

LESSON #2 QUICK REFERENCE KEYS.

KEY	FUNCTION
[Num 1]	External View
[<]	Zoom out
[>]	Zoom in
Joystick Button #2	Pan using joystick
[Num 7]	Pan left
[Num 9]	Pan right
[Num 3]	Pan up
[Num Del]	Pan down
[F1]	Forward view. Also toggles virtual cockpit on/off
[+]	Increase power (1% increments)
[-]	Decrease power (1 % increments)
[~]	Cut power (0% thrust)
[B]	Toggles wheel brakes on ground and Speed brake in air: on/off
[G]	Toggles gear: extended/retracted
[Alt-T]	Cycles through Time Compression Ratios: 1:1, 2:1, 3:1
[Ctrl-F]	Toggles Flaps: Deploy/Retract

Completion Requirements: Takeoff from the ground without crashing. Navigate to within one mile of each waypoint. This mission has seven waypoints: WPT1 through WPT4, IAF, FAF, and RWY.

1. Take a look around to get oriented. Change to an external view [Num 1], zoom out [<], and pan around with the keys [Num 7], [Num 9], [Num 3], and [Num Del] for left, right, up, and down respectively. If you have a joystick, pan around by holding button #2 down and moving the joystick. After examining the area, press [Fl] to return to the cockpit.

2. When you are ready to takeoff press [0] to bring your engines up to 100% thrust.

3. Use the rudder keys [Z] and [X] to stay in the center of the runway.

4. Watch the airspeed display on the left of the HUD. When your airspeed approaches 18 (180 knots), begin your takeoff rotation. A takeoff rotation is the pitch increase initiating the transition from ground to flight operation. Gently pull back on the joystick or hold down the [Num 2] key. In a moment, you should be airborne!

5. When you are a couple hundred feet in the air, press [G] to raise your landing gear and [Ctrl-F] to retract flaps.

6. Fly to WPT1 by keeping the waypoint designator centered in the HUD.

7. Check your Navigation Information Multi-Function Display (Nav MFD) by pressing [F7] until you see "NAVIGATION INFO" (you may have to press it twice if the "AIR TARGETS" display appears first).

8. Scroll through this screen, using [N] and [Shift-N], to view all available waypoints. The currently selected waypoint is highlighted. REMEMBER TO RE-SELECT WPT1 BEFORE CONTINUING.

9. Check your map display by pressing [M]. The waypoints appear as green circles on the map.

10. Press [F1] to return the forward-looking virtual cockpit view.

11. Look at the cluster of data in the HUD's bottom right comer. It contains information about the currently selected waypoint, including its name and distance from you (in miles).

12. About 1 mile before you reach WPT1, press [N] to select WPT2. The waypoint designator will move (possibly beyond the HUD's field of view) and the navigation director on the heading tape will shift right. Since the navigation director shifted to the right, you should turn right for the next waypoint. Look for the waypoint designator as you turn. Once the waypoint designator appears in the HUD, fly towards it like you did for the last waypoint.

13. Seek the next several waypoints in a similar manner.

LESSON #3

14. The last three waypoints have special names: IAF, FAF, and RWY. These letters represent the Initial Approach Fix, Final Approach Fix, and the landing runway. As you may have guessed, these special waypoints help pilots align for landing approaches to the runway. Some waypoints are more closely spaced, so stay alert! Be sure to select your next waypoint [N] about 1 mile BEFORE you reach the one that you are currently flying toward. Selecting waypoints early allows for time to turn toward the next waypoint--otherwise your turn might misalign your course.

15. Feel free to fly around some more and experiment with the navigation system. Also, you can select previously visited waypoints by pressing [Shift-N].

16. When you feel comfortable using the waypoints, open the In-Flight menu by pressing [Esc]. Select the "Game" menu and the "Auto Land" option.

LESSON #3: FOLLOW THE LEADER

Lesson #3 introduces formation fight. You will follow a "wing leader" through a practice course of waypoints.

Let's learn a little about the targeting system before beginning. This system provides several useful items of information about targeted objects:

- If you loose track of your target, the targeting system tells you which way to turn in order to re-intercept the target. Turning information appears as a red vertical line in your heading tape. This line is called the target designator.
- A target designator box appears around your target helping you locate targets that lie beyond visual range.
- The targeting system indicates your distance from a target.
- It indicates your target's heading.
- The targeting system also provides closure rate information (in feet per second: f/s).

The target director displays turning information in the heading tape. Its position in the heading tape indicates the direction to turn. It works like the navigation director that you use during waypoint navigation. For example, if the target director is on the heading tapes left side, you should turn left to intercept the target.

The target designator box functions identically to the waypoint designator that you use during waypoint navigation. It appears in the HUD when your target lies roughly ahead of you. Significantly, waypoints are static and air targets move. Hence you must maneuver your aircraft in order to intercept the target.

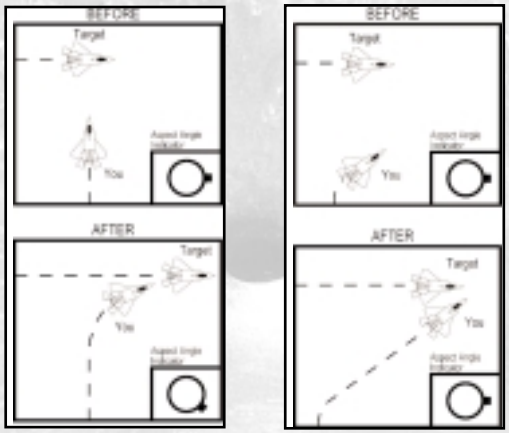
Strange as it seems, flying DIRECTLY toward the target designator box may not be the best way to intercept air targets--for the same reason a quarter back leads his throws to a wide receiver. Although flying directly toward the box would work, it wouldn't provide the most efficient interception course.

Consider the scenario depicted here:

In both cases, the target is passing from your left to right directly ahead of you. Figure A shows what happens when you head directly for the target. You end up flying along a curved path that is much longer than the straight path shown in figure B.

You may ask, "How do I know which direction the target is flying if he is beyond visual range? After all, the whole point of the designator box is to help me intercept distant targets." The answer lies in the aspect angle indicator. Look at the circle in the center of the HUD. The aspect angle indicator is a little dot located along the circle's circumference. The aspect angle indicator indicates the target's HEADING relative to your POSITION. Formally, the aspect angle is the angle between the target's tail and your line of sight. Think of this as the "side" or "orientation" of the enemy's aircraft that you would see of you were close enough. The following table simplifies this concept:

Position of Aspect Angle	Aspect of enemy
Indicator on the circle	(what you would see if you were close enough)
Top of the circle	Nose
Bottom of the circle	Tail
Left side of circle	Left wing
Right Side of circle	Right wing



A B

You should realize your heading makes no difference upon the aspect indicator's location - only your position matters. Look at the "before" pictures in figures A and B. In both cases, the aspect angle indicator is near the circle's 9 O'clock position indicating the target was crossing from left to right. Your best option is to turn to the right and aim for a point ahead of the target designator box (as in figure B). This yields a more efficient interception.

LESSON #3

Closure rate is the rate at which the gap between you and your target changes. This comes in handy while intercepting distant targets.

When this mission starts check your 12 O'clock position for a friendly F-22. This is your wing leader whom you are to follow around the training course. Your goal will be to remain as close as possible to him.

LESSON #3 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Num 1]	External view
Joystick Btn #2	Pan using joystick
[Num 7]	Pan left
[Num 9]	Pan right
[Num 3]	Pan up
[Num Del]	Pan down
[F1]	Forward view.
[+] & [-]	Adjust power (1% increments/decrements)
[Z], & [X]	Left and Right Rudder
[B]	Air Brake
[Enter]	ATA mode (and cycle through ATA weapons)
[N] & [Shift-N]	Navigation mode (and cycle through way points)
[;]	IFF Discriminator - Cycles through target selection modes: All/Hostile/Friendly
[Y]	Select closest target
[T]	Cycle through all targets
[U]	Select the target that lies most directly ahead of you.

Completion Requirements: Follow your wing leader through (at least) one lap around the waypoint course.

1. Keep your wing leader in sight at all times. If the Cockpit panel obscures your view, press [P] to hide it. Pan right for a better view by pressing [Num 9]. Alternatively, pan by holding joystick button #2 down and moving the stick. Press [F1] or tap joystick button #2 to re-center your view.

2. Use different views to look at your leader. Press [Num 1] for an external view of your aircraft. Pan around using [Num 7], [Num 9], [Num 3] or [Num Del] until you see him. Again, moving the joystick while holding button #2 does the same thing.

3. You can also look around from within the virtual cockpit. Press [F1] for a forward-looking cockpit view. Toggle the panel off or on by pressing [P] again. Once the panel is off, use the same controls as before to search for your leader.

4. Make small power adjustments ([+] and [-]) in order to vary your distance from the wing leader. A five or six percent adjustment should be plenty.

5. Keep your velocity vector EXACTLY on his tail. The rudder ([Z] and [X]) should help "fine tune" your heading.

6. Check your airspeed. When this lesson began your wing leader and you were flying at 500 knots. If you fly faster than 500 knots you will close on your wing leader - and possibly pass him by.

7. Outrunning a lead aircraft is a common error among beginners. Pay close attention to your separation in anticipation of overtaking him. If you pass him, reduce your power to 60% [6] and apply the air-brake [B].

8. Be ready for his first turn. He will be more difficult to keep track of during the turn.

9. Use your targeting system to track your wing leader. To activate the system, press [Enter] until "ATA" appears in the HUD's lower right corner.

10. Press [;] until "A" appears near the bottom of the HUD. [;] controls your "Identify Friend or Foe Discriminator" (IFF). It allows your weapons system to target all radar returns (as opposed to restricting targets to enemy aircraft).

11 Press [Y] to "lock" onto the nearest radar return. If multiple targets exist in the area, press [T] to cycle through them. Continue cycling through the targets until "F-22" appears in the HUD's lower right corner; this is your wing leader.

12. Turn toward the target director until the green target designator box appears in the HUD.

13. The closure rate information appears just below "F-22" in the HUD's lower right corner. Look at this number and adjust your power accordingly. For example, say the closure rate is large and negative. Hence, your wing leader is quickly outrunning you. You should increase your power to catch up with him.

14. If you stray far from your wing leader, avoid excessive speeds while trying to catch-up. Excessive speeds yield large closure rates. Deciding when to begin deceleration is nearly impossible since you can't even see the other aircraft until it is too late.

15. Follow your wing leader around the course of waypoints at least once.

16. When you are done, open the In-Flight menu by pressing [Esc]. Then select the "Game" menu and the "Auto Land" option.

LESSON #4

LESSON #4: AIR-TO-AIR WEAPONS TRAINING

In this mission, you will takeoff from the ground and destroy three airborne drones: a MiG-44, S-37, and Tu-160. You will be asked to use a different weapon to destroy each drone. They will not return fire but will try to avoid and spoof your missiles.

LESSON #4 QUICK REFERENCE KEYS:

KEY	FUNCTION
[F6]	Radar MFD
[M]	Map View
[B]	Air Brake
[Enter]	ATA mode (and cycle through ATA weapons)
[N], [Shift-N]	Navigation mode (and cycle through way points)
[;]	IFF Discriminator - Cycles through tar get selection modes: All/Hostile/Friendly
[Y]	Select closest target
[T]	Cycle through all targets
[U]	Select the target that lies most directly ahead of you
[Space]	Fire weapon
[<], [>]	Zoom in and out
[F9]	Tactical View
[F10]	Missile View

Completion Requirements: Destroy all three drone aircraft.

1. Take off, retract your gear [G] and flaps [Ctrl-F], and proceed to waypoint #1 at 100% military thrust [0].

2. Press [;] until "A" appears near the bottom of the HUD. This allows your weapons system to target all radar returns (as opposed to restricting targets to enemy aircraft).

3. Use your radar [Alt-R] to locate the targets while enroute. On the radar display, objects appear as dots whose color connotes information about the object:

COLOR/SYMBOL	MEANING
Red	Enemy Target
Green	Friendly
White	Missile
Gray	Unidentified Object
White	Circle Surrounds the currently selected target
Bold	Object is above your altitude

4. The map display [M] uses colors similarly, but arrowheads are used instead of dots. The arrowheads point in the target's direction of travel. Your weapons system will notify you when any hostile target is within radar range.

5. Arm an AIM-9 Sidewinder missile by pressing [Enter] until you see "S/W" near the HUD's lower left corner. The quantity of missiles remaining onboard appears just to the right of the letters "S/W." Also, the aiming reticle appears in the center of the HUD. The aiming reticle looks like a circle with a small dot in the center. Ignore it for now; it will become important in a moment.

6. Destroy the MiG-44 first. Three methods exist for choosing among available targets:

KEY	TARGETING FUNCTION
[Y]	Selects the closest target
[U]	Selects the target that lies most directly ahead of you in center of HUD
[T]	Cycles through all available targets.

7. Press [T] to cycle through targets until "MiG44" appears in the HUD's lower right corner.

8. As you approach the MiG, watch for the diamond shaped missile seeker to move toward the target designator box. When the missile seeker reaches the box, you will hear a solid tone and the diamond will grow larger indicating a successful radar lock.

9. **BE CAREFUL NOT TO PASS YOUR TARGET!** This is a common error among beginners. Pay close attention to the information in the HUD's lower right corner-- especially the closure rate information which shows how fast (in feet per second) you are approaching your target.

10. A large (positive) closure rate implies you are quickly gaining on your target. In this case you may need several miles to slow down in order to match his speed and remain behind him. Reduce power or use your speed brake [B] to slow down more quickly.

11. Use the aspect angle indicator (see lesson #3) to align your aircraft behind the target. Missiles track targets more effectively when the target is fired upon from behind.

12. When you are approximately 2.2 miles from the drone, the range circle becomes highlighted around the aiming reticle's circumference. The aiming reticle is the circle in the HUD's center. The range circle indicates the target is within range of your currently selected weapon. As you approach the MiG-44, the circle's highlighted portion disappears in a counter-clockwise fashion. The highlighted portion corresponds directly to the size of the gap between you and your target. It continues to disappear as long as you approach the target.

13. Press [Space Bar] or the corresponding joystick button to fire the Sidewinder.

LESSON #5

14. Watch your missile head toward the drone. If by chance the missile fails to hit the target, fire another. If you hit the target, the word "Destroyed" will appear in red near the bottom right corner of the HUD.

15. Target the S-37 similarly, but this time destroy him with an Advanced Medium Range Air to Air Missile (AMRAAM).

16. Cycle through your weapons using [Enter] until "AM" appears in place of "S/W" in the lower HUD's lower left corner. Lock your weapons system on the S-37 using [Y] or [T] as you did before.

17. Again, press [Space Bar] or the corresponding joystick button to launch the AMRAAM.

18. Use the missile view [F10] to watch the missile seek and destroy the target. Once the missile detonates, you will see a steady cam view of the explosion. Shortly after the explosion your view returns to its previous perspective (i.e. virtual cockpit view). If you wish to return to the cockpit before the missile explodes, press [F1].

19. Try your guns on the Tu-160. Use your throttle to approach him. Again, be careful not to pass him by. As before, cycle through your weapons using [Enter] until "GUN" appears in the lower left of the HUD. Guns require a little more finesse.

20. Maneuver your aircraft so the small dot in the center of the aiming reticle is EXACTLY on the Tu-160.

21. Alternatively, you may find it easier to align yourself at the target's 6 O'clock position and zoom in on him [<] before firing. Use whichever method works best for you.

22. Press [Space Bar] or the corresponding joystick button to fire the cannon. Fire in "bursts" by holding the fire control down for short intervals.

23. After destroying all three drones, open the In-Flight menu by pressing [Esc]. Select "Auto Land" from the "Game" menu. Alternatively, if you want to fly this mission again select "Restart Current Mission" from the "game" menu.

24. If you're looking for a challenge, restart the mission and increase the gun aiming difficulty. Restart the mission by opening the In-Flight menu and selecting the "Restart Current Mission" option. To increase the aiming difficulty, press [Esc] to bring up the In-Flight menu and select the "Cheats" pull down menu. Arrow down [Ý] to "Gun Aiming Ease" and press [Enter]. This makes gunning down enemy targets more difficult.

LESSON #5: CARRIER CATAPULT LAUNCHES AND WINGMAN COMMANDS

In this lesson you will learn to launch from a carrier and then command a wingman to attack one ground and one air target.

Since carrier deck space is so limited, engineers have designed powerful steam driven catapult launches that accelerate aircraft from 0 to 125 knots in less than 200 feet within 3 seconds. You will learn the simple procedure for getting you plane airborne using this system.

Fighter pilots rarely fly combat missions without wingmen. A wingman is a friendly aircraft that helps the wing leader (you) with his mission. While enroute, wingmen usually fly in formation near their wing leader. In battle, he takes offensive and defensive orders from his leader. *JetFighter IV* has three wingman commands: attack [Alt-G], follow [Alt-F], and hold [Alt-H]. (Hint: these letters stand for "Go Attack", "Follow", and "Hold". Also, notice these keys lie side-by-side on the keyboard). You will command your wingman to destroy one pre-designated ground target and one air target. You will have no weapons during this lesson. You must rely on your wingman to carry out your orders to complete the mission.

LESSON #5 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Num -]	External view
[Num 7]	Pan left
[Num 9]	Pan right
[Num 3]	Pan up
[Num Del]	Pan down
[Num *]	Carrier tower view
[F1]	Forward view.
[P]	On/off virtual cockpit
[F2] - [F4]	Virtual cockpit preset views
[F5] - [F8]	Virtual cockpit MFD displays
[Alt-G]	Wingman command: Go attack
[Alt-F]	Wingman command: Follow player
[Alt-H]	Wingman command: Hold
[Backspace]	Cycles through ATG weapons
[T], [Shift T]	Cycle through targets
[Y]	Selects the closest target
[U]	Selects the target that lies most directly ahead of you
[F9]	Tactical View
[W]	Wingman view
[Enter]	ATA mode (and cycle through ATA weapons)
[;]	IFF Discriminator - Cycles through target selection modes: All/Hostile/Friendly

Completion Requirements: Perform a carrier launch without crashing and command your wingman to destroy one ground and one air target.

LESSON #5

1. Let's inspect the carrier deck before takeoff. Press [Num -], for an external view. You will see the tail of your plane.

2. Zoom out [<] and pan around, using [Num 7], [Num 9], [Num 3], and [Num Del], for a bird's eye view of your surroundings. Joystick users can pan around by holding button #2 down and moving the stick.

3. Press [F1] (one or two times) to return to the forward looking cockpit view with the panel displayed. The panel is part of the virtual cockpit.

4. Using the same numpad keys as before (or the joystick), look around inside the cockpit. Your view will shift as if you were moving your head around.

5. Panning is great for viewing scenery or distant targets, but dogfights require faster head movements. The keys [F1] through [F4] "snap" to one of 4 preset views-- try them out.

6. The keys [F5] through [F8] allow you to look within the aircraft at the various display panels. Some of these displays have more than one mode. Cycle through display modes by repeatedly pressing the same key.

7. After you've looked around, it's time to launch. Press [F1] to look forward. Since carrier takeoffs require maximum acceleration, you must use full afterburner [\]. Once the engines spool up, the catapult launches you forward off the carrier deck like a big sling shot.

8. You must pull up slightly after you leave the carrier deck unless you want to go fishing!

9. Once airborne, retract your gear [G] and your flaps [Ctrl-F] and adjust your power to 100% [0].

10. Your wingman will eventually fly to your 11 O'clock position. To look at your wingman press [W]. Press [W] again or [F1] to return to the forward view.

11. After you turn toward WPT2, command your wingman to attack the ground target. To do so you must be in Air to Ground (ATG) mode. Press [Backspace] until you see "ATG" appear near the HUD's bottom left corner.

12. Select the ground target by pressing [T]. The highlighted name corresponds to the currently selected target.

13. Command your wingman to attack this target by pressing [Alt-G]. This orders him to attack whatever target you have selected.

14. Both your panel and your wingman's voice (if you have a sound card) will verify that your command was received. The wingman will break formation and attack the target.

15. You can watch the wingman's progress in several ways:

▼ Press [F9] for a tactical view of the target. Press [W] to view your wingman.

▼ Pan around as in previous lessons: press [Num -], for an external view. This shows you the tail of your plane. Zoom ([<] or [>]) as necessary and pan around, using [Num 7], [Num 9], [Num 3], and [Num Del].

▼ Pan around by holding joystick button #2 down and moving the stick.

16. The wingman will continue to fire upon the target until he destroys it. When he is done he will "form up" by returning to your 11 O'clock position.

17. Remain near the target while your wingman destroys it. When your wingman fulfills his order, the word "DESTROYED" appears in red near the HUD's bottom right corner. (Assuming you have not selected a new target.)

18. Issue an air attack command now. As before, you must be in Air to Air mode (ATA) mode in order to issue an air attack command. Enter ATA mode by pressing [Enter] until "ATA" appears at the bottom left of the HUD.

19. Target the enemy aircraft by pressing [T]. You should see "MiG42" appear in the HUD's lower right corner.

20. Press [Alt-G] (As you did for the ground target) to instruct your wingman to destroy the aircraft. Try to follow your wingman as he attacks the target.

21. Experiment with the hold command [Alt-H] and follow command [Alt-F] and observe your wingman's behavior.

22. When you are done, access the In-Flight menu by pressing [Esc]. Then select the "Game" menu and the "Return to Carrier" option.

LESSON #6

LESSON #6: RUNWAY LANDING AND ILS TRAINING

Lesson #6 prepares you for the demanding task of landing a jet aircraft. The Instrument Landing System (ILS) is a navigation aid that guides your approach to the landing strip. This lesson begins about 6 miles before the Initial Approach Fix (IAF). The IAF serves as a starting point that aligns you with the runway.

The HUD will be in navigation mode with the Initial Approach Fix (IAF) selected. The IAF is just like any other waypoint, except it identifies the beginning of an instrument approach. Fly DIRECTLY to this waypoint. Precision is very important since arriving at the correct altitude ensures proper glide slope interception.

Your primary tasks are to slow down, descend, and maintain your course. Stay sharp though! You will soon realize that this isn't as easy as it sounds.

Before using the ILS you should read about the "Instrument Landing System" (in the Appendix). This section explains procedures and terms that will greatly simplify this lesson.

LESSON #6 QUICK REFERENCE KEYS:

KEY	FUNCTION
[0] - [9]	Keyboard Number Keys Adjusts your power (in 10% steps)
[-], [+]	Adjusts your power (in 1 % steps)
[G]	Extend/Retract landing gear
[Alt-F]	Deploy/Retract flaps
[N], [Shift-N]	Navigation mode (and cycle through way points)
[Z], & [X]	Left and Right Rudder
[~]	Cut power (0% thrust)
[B]	Air brake in air, wheel brakes on ground (below 100 knots)

Completion Requirements: Perform a safe ground landing using your ILS.

1. As you approach the IAF, power down to 50 % (press [5]).

2. When you are within 1 nM, select the Final Approach Fix (FAF) [N], and turn towards it.

3. Reduce power to 30% (press [3]).

4. Deploy flaps [Ctrl-F] and lower the landing gear [G]. The ILS system displays on the HUD when the landing gear is lowered.

5. Begin to make corrections to align the two dotted lines of the ILS (one horizontal and one vertical) with the solid "target" lines of the ILS. The horizontal dotted line indicates deviations from the glide slope while the vertical dotted line indicated deviations from the runway orientation (or localizer). If your velocity vector is pointed at the approach end of the runway AND both dotted lines are centered, then you are perfectly aligned for landing.

6. If the horizontal dotted line in the ILS is above the target line, place your velocity vector higher than the approach end of the runway in order to fly up to the glide slope. If the horizontal dotted line is below the target line, you must place the velocity vector somewhere on the ground in front of the runway in order to fly down to the proper glide slope. When the dotted line is about to be centered, transition the velocity vector to point right at the beginning of the runway.

7. If the vertical dotted line in the ILS is to the left of the target line, place your velocity vector left of the runway in order to get aligned with the runway. If the vertical dotted line is to the right of the target line, you must place the velocity vector right of the runway in order to get aligned with the runway. When the dotted line is about to be centered, transition the velocity vector to point right at the runway.

8. One mile before the FAF, press [N] to select the airport's runway waypoint (RWY) and place the velocity vector EXACTLY on the approach end of the runway. The approach end is the end of the runway you want to land on.

9. Correct your course as necessary and place the velocity vector back on the touchdown point.

10. 0.3 miles before touchdown cut the power by pressing [~]

11. As the engine spools down (almost immediately), add a SLIGHT amount of joystick back pressure to initiate a flare. A flare is the transition from flight to ground operations. Ideally, it begins about 70 feet above the runway and continues until touchdown. Throughout a flare your pitch should be slowly and smoothly increasing while your descent rate and airspeed diminish. By the time you touch down you should satisfy two criterion: 1) Assume a pitch that allows your main landing gear (the two back tires) to touch the ground before your nose gear. 2) Let the airspeed drop to just above stall speed. Perform a flare by momentarily pressing [Num 2] or GENTLY pulling back on the joystick.

12. Just after touchdown apply the air brakes [B]. After you slow to 100 knots, the wheel brake can be applied to rapidly come to a stop (press [B] twice).

13. Use the rudder pedals ([Z] and [X]) to steer keeping your aircraft in the center of the runway.

14. Don't get discouraged if your first landing attempt is not picture perfect. You will probably make several attempts before getting it right - but with a little practice you'll be making beautiful landings every time. To attempt another landing press [Esc] to access the In-Flight menu. Then select the "Game" menu and the "Restart Current Mission" option.

15. Once you've mastered airfield landings, you are ready for a bigger challenge - daytime carrier landings.

LESSON #7

LESSON #7: DAYTIME CARRIER LANDINGS

Many military pilots jokingly refer to carrier landings as "trying to land on a postage stamp." Now it's your turn to land a 28,000 pound aircraft traveling at 225 knots on an 800 foot runway!

The Carrier Landing System (CLS) functions identically to the ILS, and will help you align your approach with the carrier. In fact, this lesson is almost identical to lesson #6, except you'll be landing on a carrier instead of a landing strip.

Before flying this mission you should read the section titled "Instrument Landing System" (Appendix). It contains some extremely helpful tips on flying approaches.

LESSON #7 QUICK REFERENCE KEYS:

KEY	FUNCTION
[G]	Extend/Retract Landing Gear
[Ctrl-F]	Deploy/Retract Flaps
[A]	Extend/Retract Arrestor Hook
[N], [Shift-N]	Navigation mode (and cycle through way points)
[Enter]	ATA mode (and cycle through ATA weapons)
[Z], and [X]	Left and Right Rudder
[~]	Cut power (0% thrust)
[\]	Full Afterburner (AB 5)

Completion Requirements: Perform a safe carrier trap using your CLS.

1. Intercept the IAF waypoint and fly the approach as described in steps 1 through 8 in lesson #6. Pay special attention to the waypoint designator that appears directly over the carrier when the CVN waypoint is selected. This helps you identify the carrier among the fleet of ships in the water.

2. You must first configure your aircraft for landing. Press [G] and [A] to extend your gear and arrestor hook. Press [Ctrl-F] to extend your flaps.

3. Carrier landings require much more precision than airfield landings. Use extra vigilance in keeping the velocity vector on the carrier deck as less room exists for error here.

4. Remember to make localizer and glide slope corrections early so you can keep the velocity vector EXACTLY on the approach end of the deck for as long as possible.

5. When you get close to the carrier you will see four arresting cables stretched across the deck. Ideally, your arrestor hook will grab onto the third cable and jolt you to a stop. Aim for a point BEFORE the third cable!

6. Unlike a ground landing, you should not flare. This just wastes valuable runway space. In carrier landings, you should literally fly right into the deck!

7. Crazy as it sounds, you should add full afterburner [\] about 1,000 feet before the carrier deck. By adding full afterburner you may prevent a disaster in the case of a bolter. A bolter is when your arrestor hook fails to trap a cable. Adding full power allows you to re-attain flight if this happens.

8. If your plane comes to a stop on the carrier deck you trapped the cable. In this case, cut the power by pressing [~]. When the power is at 0% retract the arrestor hook by pressing [A].

9. If you want to taxi around the deck, add a small amount of power [+], and use the rudder pedals to steer ([Z] and [X]).

10. If your approach misses the carrier (which even the best aviators do from time to time), go around and try again starting at waypoint IAF.

11. Don't get discouraged if your first landing attempt is not perfect. It may take a few tries before you get it right but with a little practice you'll be making precision landings every time.

LESSON #8

LESSON #8: AIR-TO-GROUND ATTACKS WITH MAVERICKS

Lesson #8 teaches you the procedures to target and destroy ground objects using Maverick missiles.

Since Maverick missiles have propulsion and guidance systems, they are often referred to as "smart missiles." Usually, they are used in conjunction with pre-designated targets. These are fixed targets like buildings or bridges. Their location is programmed into your weapons system before you leave the base or carrier. Therefore, this easy-to-use weapon is extremely accurate when used properly. The fighter pilot's task is merely to get the missile close enough to its target and fire it.

LESSON #8 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Backspace]	Cycles through ATG weapons
[F7]	Right MFD: Navigation Information / Air Targets
[T], [Shift-T]	Cycle through targets
[Space]	Fire Selected weapon
[F10]	Missile view
[Alt-M]	Re-Arm Aircraft (Cheat)

Completion Requirements: Destroy the three pre-designated ground targets using Maverick missiles.

1. Take off from the runway and fly towards WPT1. Your first target is near this first waypoint.

2. Arm a Maverick missile as your weapon by pressing [Backspace] until "MAV" appears near the HUD's lower left corner. Notice the quantity of Mavericks in your weapons store appears just to the right of the letters "MAV." Also, the letters "ATG" appear just under "MAV" indicating that the HUD is in Air To Ground mode.

3. Now you must locate the pre-designated targets. You already know how to do this since your navigation system recognizes pre-designated targets exactly like waypoints. We'll quickly recap how this works:

- Press [T] or [Shift-T] until "Refinery" appears in the HUD's lower right corner. The HUD displays your distance from this target under the word "Refinery."
- The navigation director in the HUD's heading tape indicates which direction you should turn to intercept the target. Turn towards the navigation director until you see the green target designator box appear. Your selected target is in the center of the box. If you keep the box centered in the HUD, you will eventually reach the target. If the target lies too far below you when you initially turn toward it, the targeting box may be compressed near the bottom of the HUD or out of sight altogether.

4. Attaining proper alignment with the target is quite important. For best results, fire the missile when your target is below you, and centered in the HUD.

5. When you are within missile range of your target (7 nM), the message 'IN RNG' will appear in the lower-right corner of the HUD. Fire the Maverick by pressing [Spacebar] or the joystick fire button.

6. You can watch the missile's flight by selecting missile view [F10].

7. When you hit the target it will burst into flames. When you destroy a target the word "DESTROYED" appears in the HUD. Some targets may require several hits for destruction. If you miss, re-align your aircraft with the target and fire another Maverick.

8. Your weapons system remembers which targets you have destroyed. To review the destroyed targets, look at the "Navigation Information" MFD [F7]. The Navigation MFD displays the target's relative bearing and distance information in red if you already destroyed the target.

9. Press [N] twice to display WPT2 and fly towards it. The final two ground objects to be destroyed will be located near this waypoint.

10. As you approach WPT2, arm another Maverick [Backspace]. Press [T] until "Factory A" appears. Fire when you are within range and positioned so that the missile will clear any hills nearby.

11. Press [T] until "Factory B" appears. This time wait until you are 3 to 4 miles from the target before firing.

12. Once you fire the Maverick (by pressing the joystick button or [Spacebar]), select the tactical view [F9]. Tactical view allows you to watch from the cockpit as your missile destroys the factory.

13. You may find it useful to hide the cockpit display panel by pressing [P].

14. Press [<] or [>] to zoom in or out. [F1] re-centers your view.

15. Your store of Mavericks has now decreased from its capacity load of 4. If this were combat, you may wish for more ammunition. *JetFighter IV* provides a "Cheat" for this contingency. First activate the "Cheat" from the In-Flight menu. Press [Esc], to the "Cheats" and activate "Re-Arm Aircraft". Re-arm your aircraft by pressing [Alt-M].

16. If you prefer realism, avoid the "Cheats" by landing at an airport or carrier. When you come to a complete stop on the runway, your aircraft is automatically refueled and re-armed.

LESSON #9

LESSON #9: AIR-TO-GROUND ATTACKS WITH UNGUIDED MUNITIONS

Lesson #9 teaches you to target and destroy ground objects using unguided munitions (MK bombs). You will be flying the same route and destroying the same objects as in the previous mission. Note the differences in approach and technique needed to deliver the ordinance to the target than in the previous mission.

Unlike Mavericks, MK bombs lack propulsion and guidance systems, thereby classifying them as "dumb bombs." The MK comes in two sizes: 500 lb. (MK82) and 2,000 lb. (MK84).

Your aircraft is equipped with a CCIP system that helps you deliver dumb bombs. Since MK bombs lack propulsion and guidance systems, their accuracy depends exclusively on pilot skill. The CCIP system's display appears as a line extending from the HUD to the ground. The ground end on the line is called the impact point. The impact point identifies where the bomb would strike if you dropped it at that moment - hence the name "Continuously Calculated Impact Point." To help you better identify the impact end of the line, it appears within a pipper (a circle).

LESSON #9 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Backspace]	Cycles through ATG weapons
[Alt-A]	Toggle altimeter between MSL and AGL modes
[F6]	Radar MFD
[Spacebar]	Fire Selected weapon/Drop Bomb
[F10]	Missile/Bomb view

Completion Requirements: Destroy the three pre-designated ground targets using unguided munitions.

1. Take off and fly toward WPT1. While enroute, arm your MK82 bombs by pressing [Backspace] until "MK82" appears near the HUD's lower left corner. As with other weapons, information about your MK82 bombs appears in the HUD's lower left corner. Namely, the HUD shows the type of weapon selected, quantity remaining, and targeting mode. In this case four MK82 bombs are loaded and the HUD is in CCIP mode.

2. Maintain your course to WPT1 while you practice with the CCIP system.

3. Place your altimeter in AGL mode by pressing [Alt-A] until "G" appears near the altitude tape.

4. Since MK bombs lack propulsion systems, their range depends exclusively on your speed, altitude and attitude. While maintaining a fixed altitude of about 1,000 feet AGL, adjust your thrust with the keyboard numbers [1] through [0]. Notice how the distance between your aircraft and the end of the targeting line varies directly with your speed. Sometimes the impact end of the line extends beyond the HUD's field of view. For example, in level flight at low airspeeds the impact point lies below the HUD's field of view. In this case, you must pitch down slightly to target a ground object.

5. You may find it useful to hide the cockpit display panel by pressing [P].

6. Observe the pipper's behavior as it follows the terrain. As the pipper reaches the top of a ridge it may seem to disappear because the impact point lies on the far side of the ridge beyond your field of view.

7. Attempt to get a feel for the pipper's behavior by adjusting your pitch first up, then down.

8. Bombs should land exactly where the tip of the targeting line was when you released them.

9. The CCIP system is most accurate when you drop bombs from an altitude of about 1,000 feet for every mile they must travel horizontally.

10. Steer towards WPT1 and check your distance in the HUD's lower right corner.

11. Press [T] until "Refinery" appears in the HUD's lower-right corner.

12. Fly straight and level keeping the targeting line over the target. If necessary, fine tune your heading using the rudder, [Z] and [X].

13. Keep your eye on the impact point at the end of the targeting line. As soon as it is EXACTLY over the target, drop a bomb by pressing [Spacebar] or the joystick button.

14. Press [F9] for tactical view or [F10] for missile view if you want to watch the bomb fall. The target will burst into flames when you hit it.

15. If you miss the target return for another pass.

16. Continue on to WPT2 and destroy "Factory A" and "Factory B" to complete the lesson. If you run out of MK82 bombs, press [Backspace] to select MK84 bombs to finish the job.

LESSON #10

LESSON #10: AIR COMBAT MANEUVERING

This lesson introduces you to the joys of hostile fire. You will face Anti-Aircraft Artillery (AAA), Surface-to-Air Missiles (SAM's) and hostile aircraft. You will also be given a mission to complete before heading home.

AAA units will begin firing as you fly within range. The explosions and black clouds you see are called flack. Although these explosions may damage your aircraft, only a direct hit will render it inoperable.

Heat seeking and radar missile locks represent a more serious threat. Your weapons system warns you when a missile locks onto your aircraft. It sounds a warning horn and displays the message "WARNING: HEAT-SEEK/RADAR-HOME MISSILE" in your communications message panel.

A missile lock does not predict imminent destruction; several defensive options exist. You can:

- Out-maneuver the missile.
- Deploy Chaff Charges to disorient Radar Guided (RG) missiles.
- Activate your Electronic Countermeasure (ECM) Jammer to confuse RG missiles.
- Deploy Flares to disorient heat-seeking missiles.

Chaff charges confuse radar guided missiles by dispensing thousands of radar reflective metal scraps that missiles confuse for your airplane.

Your ECM Jammer emits microwaves that distort / confuse enemy radarscopes.

Flares disorient heat-seeking missiles by producing an intense ball of heat that missiles may prefer over your aircraft's exhaust.

Defensive countermeasures weigh much less than bombs and missiles. You can usually carry as many as 30 flares and 30 chaff charges - so use them liberally! If a missile is fired at you and you're not sure which countermeasure to deploy, use both!

Here are a few general tips to help you evade missiles:

- Out-endure distant missiles by forcing them to approach you from the side-- thereby enticing the missile to waste fuel turning.
- Use low-G turns while keeping the missile to your side.
- When the missile is about 2,000 feet away, dispense several countermeasures while sharply turning toward the missile.

LESSON #10 QUICK REFERENCE KEYS:

KEY	FUNCTION
[Backspace]	Cycles through ATG weapons
[Enter]	ATA mode (and cycle through ATA weapons)
[Alt-R]	Toggles on-screen radar on/off
[Ctrl-R]	Enables the radar's "Auto Range" feature
[R]	Cycles through radar ranges
[;]	IFF Discriminator-- Cycles through target selection modes: All/Hostile/Friendly
[T], [Shift-T]	Cycles through pre-designated targets
[C]	Deploy a chaff charge (defensive counter measure)
[J]	Activate your ECM Jammer
[F]	Deploy a flare (defensive countermeasure)

Completion Requirements: Survive enemy fire. Destroy three transmission towers near WPT4. Return safely to base.

1. Take off and fly towards WPT1. Enable your on-screen radar be pressing [Alt-R] (if it isn't already on).

2. As you approach WPT1, AAA will begin to fire on you. Try to maneuver to avoid the worst of it.

3. A radar-guided SAM site is on an island near WPT2. As you approach the waypoint the SAM will fire on you. Use chaff and maneuver to spoof the incoming missile.

4. When the enemy fires upon you, your communications display window informs you what type of weapon he fired.

5. Locate the missile as soon as possible using the following methods:

- Check your on-screen radar. Missiles appear as white dots. Press [R] to adjust the radar's range if you don't see any white dots.
- Check your map view by pressing [M]. Here they appear as red arrows.
- Visually identify missiles. For visual identification use the preset "snap" views ([F1] through [F4]) or look around with the Numpad keys ([Num 7], [Num 9], [Num 3], and [Num Del]).

6. Check your communications display window (located below the HUD). If the missile is radar guided, press [J] once and [C] several times to jam the weapons radar and deploy some chaff charges.

7. If a heat-seeking missile locks onto your aircraft, press [F] several times to deploy some flares.

8. Once you have successfully evaded the missile, continue on to WPT3. Between waypoints WPT2 and WPT3 are two SAM sites. One will be radar-guided, the other a heat-seeker. You will be in mountainous terrain at this point so try using the terrain to spoof any incoming missiles.

9. As you approach WPT3, an enemy aircraft will appear on your radar. Target and destroy this bandit. Be careful, he will be gunning for you as well.

LESSON #10

10. Please note:

- The title in the HUD's lower right corner distinguishes between enemies and allies: enemy and ally targets correspond to red and green titles respectively.
- A large green "X" appears over the target designator box when friendlies are targeted.
- Your "Identify Friend or Foe Discriminator" (IFF) can disallow weapon locks on friendly aircraft. Switch your IFF discriminator to "Hostile Only" mode by pressing until "H" appears in the bottom of the HUD.

11. Once you successfully destroy the enemy aircraft, you will be assigned a mission to fly to WPT4 and destroy three transmission towers. Expect the target area to be defended by AAA and SAM's. Also expect enemy aircraft to intercept you. You must destroy the towers AND return safely home to complete the lesson. Good luck.

LESSON #11: NIGHTTIME CARRIER LANDINGS

If you have completed all of the previous training missions, you should be fairly confident of your abilities. However, there is one final test for a naval aviator. In this lesson you must pass the most feared test given to any navy pilot: land on a moving carrier at night.

1. It is very important to trust your CLS system all the way to the deck. With fewer visual cues at night, you can easily get disoriented.

2. Use the same procedures given in lesson #7. You will start this lesson in the air above the Pacific Ocean heading for WPT1. You are flying parallel to the carrier on a racetrack course. After WPT1, the familiar sequence of the IAF, FAF, and CVN waypoints will guide you to the carrier on the proper glide slope.

3. Should you fail to land the first time, circle around and try again. Good luck.

CONGRATULATIONS!

You have completed all eleven training missions and are now ready for active duty. If you flew these missions as a campaign, you should change your pilot's campaign to "Fortress America" and begin the battle.

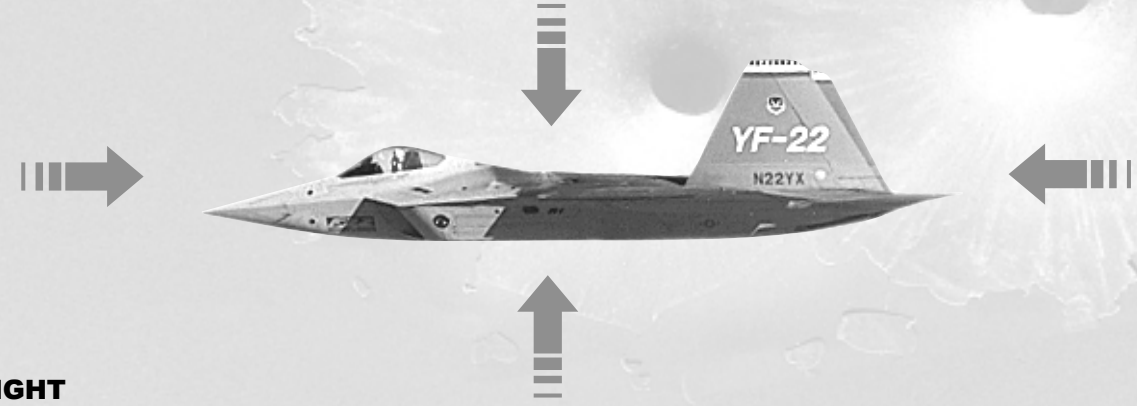
You will be assigned to the CVN George Washington that is currently conducting fleet carrier qualifications off the Virginia Capes. However, you will start the campaign on detachment to Fallon Naval Air Station in Nevada where you will undergo training in the new LANTIRN bombing system before joining the fleet.

PILOT NOTES

JetFighter IV does not require any specialized knowledge about flight simulation. However, it is useful to know some basic information about aerodynamics, flight controls, pursuit tactics, dogfighting, emergency procedures and technical data. This section will provide you with detailed pilot's notes on these subjects.

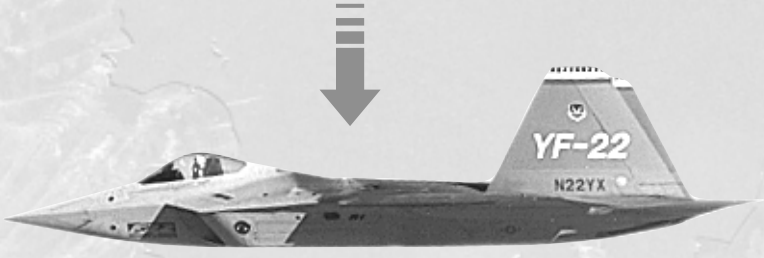
AERODYNAMICS

Piloting a fighter requires an understanding of aerodynamics and your airplane's attributes. You must appreciate the impact of weight, lift, drag and thrust. In the heat of combat, these issues are more than just an idle curiosity. Understanding how and why your plane operates is essential to victory.



WEIGHT

The concept of weight is probably the easiest to understand. An airplane, like any object, has a weight as the result of gravity. In the air, this weight acts as a downward force on the plane. As you know, the force of gravity is a constant of 32.2 feet per second.[2] Of course, this factor is the greatest obstacle to flight.



LIFT

Lift is the force exerted on the planes wing as it cuts through the air. It is the push up or down (depending upon the angle of the wing) which serves to raise or lower the airplane. If the force of lift exceeds the planes weight, the aircraft will gain altitude. Conversely, if the force of lift is less than the planes weight, it will descend.

The angle of the wing is called its “angle of attack.” When your wings are at a greater angle to the airflow (“‘steep”), the lift is greater. Of course, the “flatter” your wings are, the less lift there is. The relationship between lift and angle are not perfect, however. If a wings angle greatly increases, less air can pass and lift decreases. Without adequate thrust, the plane will literally fall out of the sky.

Although the movement of air over the wing surfaces create lift, they don’t help the plane maneuver. It is up to the planes ailerons, rudders and elevators to direct the airflow. The controls alter the flow of air and change the lift, creating the ability to maneuver. Without these controls, an airplane would only be able to go up or down.

THRUST

In a fighter, thrust is the force exerted by the jet engines that drive you through the air. It is the reason that air flows over the wings and creates lift. Without this thrust, the plane would sit idly on the ground. Consequently, it is the single most important component of air travel.

DRAG

Drag is the side effect of thrust. It is the planes resistance to the air that acts as a force pushing it backward. Like lift, however, drag increases the faster the fighter goes and the steeper the angle of attack.

BASIC CONTROLS

Although there is nothing “basic” about flying a million dollar jetfighter, there is some fundamental equipment. There are three main controls inside a jetfighter. They are the stick, throttle, and rudder pedals. You need to familiarize yourself with them since they are your link to the aircraft.

FLIGHT STICK

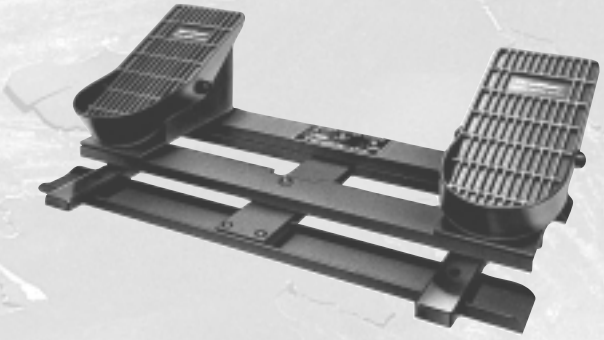
The flight stick (or “stick”) is easily the most important piece of equipment in the cockpit. It is your main source of control and direction, acting like the airplanes steering wheel. However, unlike its automotive cousin, a plane has to operate in three-dimensional space. This means that the stick can move the plane left and right, as well as up and down.

In flight, pulling back on the stick will raise the front (or ‘nose”) of the plane and gain altitude. Conversely, pushing forward on the stick will lower the nose and lose altitude. The direction of the nose is called “pitch”. The stick accomplishes these changes by moving the “elevators” on the planes wings.

The stick also controls the aircraft’s left and right (or “lateral”) movement. By moving the stick to the left, the aircraft will roll to the left. Similarly, pushing the stick to the right, it will roll to the right. This lateral movement is controlled by the airplanes “ailerons.”

Note: Besides left, right, up and down, the stick can also be used in degrees (i.e., down-left). For example, by pushing the stick forward and to the left, the fighter will dive and roll to the left.

RUDDER PEDALS



You may have realized that the stick only controls the plane in two dimensions: roll and pitch. The third dimension arises when you turn (not roll!) the plane left or right. This is called 'yaw." It is controlled by the planes rudder pedals on the floor of the cockpit. Applying right rudder yaws the plane to the right, while applying left rudder yaws the plane to the left.

Note: Although** JetFighter IV **will work with many kinds of rudder pedals, they are not necessary. You can still yaw the airplane by using the keyboard.

THROTTLE

The throttle controls the fighters speed (or thrust). You can increase the planes thrust by pushing the throttle forward, or decrease your thrust by pulling back on the throttle. Of course, the throttle is not a switch. Like a gas pedal, more thrust is created the further you push it.

Combat experience has shown that sometimes a pilot needs an extra "boost" to complete a mission. Sometimes this means closing in on a target; other times it means evading a surface-to-air missile. As the result, many modern planes are equipped with "afterburners." These afterburners actually increase engine thrust by dumping raw fuel into the engine's exhaust and igniting it. Although it creates a powerful effect, it consumes fuel at an alarming rate (as much as five times the full throttle). Consequently, afterburners must be used very sparingly.

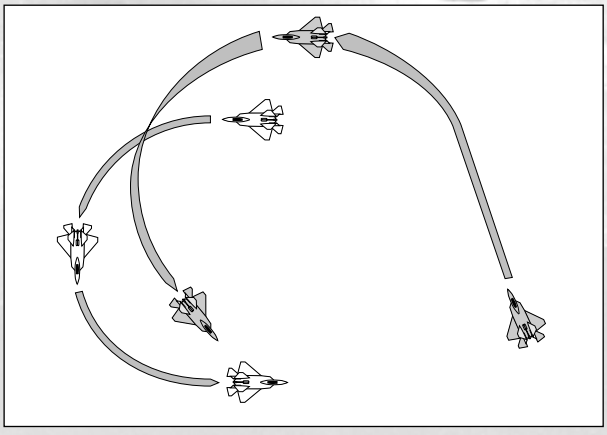
Note: Although *JetFighter IV* will work with many throttle systems, they are not necessary. You can still adjust the airplanes speed by using the keyboard.

PURSUIT TACTICS

If aerodynamics are the basics of flight, pursuit tactics are fundamentals of air combat. They are absolutely necessary to create an opportunity to engage an enemy. Pursuit curves allow you to lay in a trajectory that will bring you closer to your target and into a better firing position. In general, there are three types of pursuit tactics: pure, lead, and lag.

PURE PURSUIT

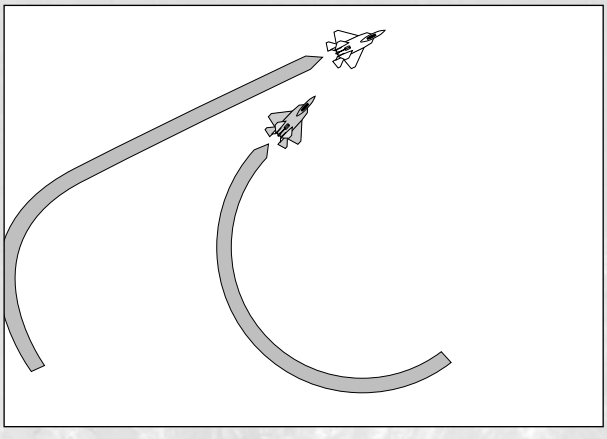
Pure pursuit requires you to simply follow the target's movements. It is most effective when you are gradually closing in on a slower target. You generally want to use pure pursuit right before you attack since the position maximizes combat effectiveness.



LEAD PURSUIT

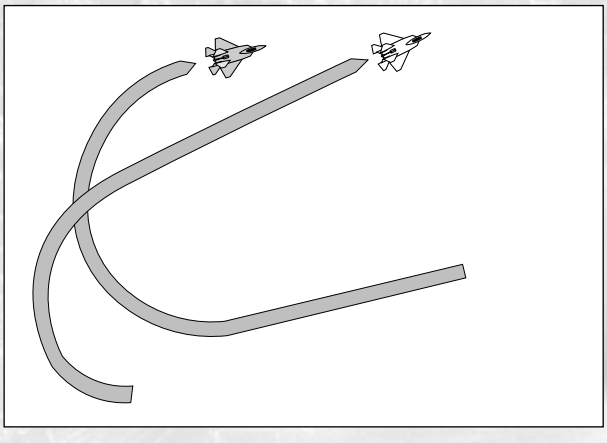
Lead pursuit is the best pursuit tactic to use to close on your target. It requires you to anticipate where the bandit will be and to head toward that spot (or 'lead" the enemy). The goal is not to get to the spot first, but to be lined up to fire at the bandit when it arrives at there. Because you're pointing ahead of the target, you will close more quickly in lead pursuit than by using any other tactic. However, if you set the pursuit curve too far away, the bandit may be able to escape.

Note: It is better to perform several smaller lead pursuit curves, then to use just one large curve.



LAG PURSUIT

Lag pursuit is most effective when your aircraft has a superior turn rate. This pursuit curve requires you to set your flight path just slightly behind the target, following it through a turn. Easy to accomplish, just make sure that your flight path indicator is slightly below the opponent's plane.



ADVANCED MANEUVERS

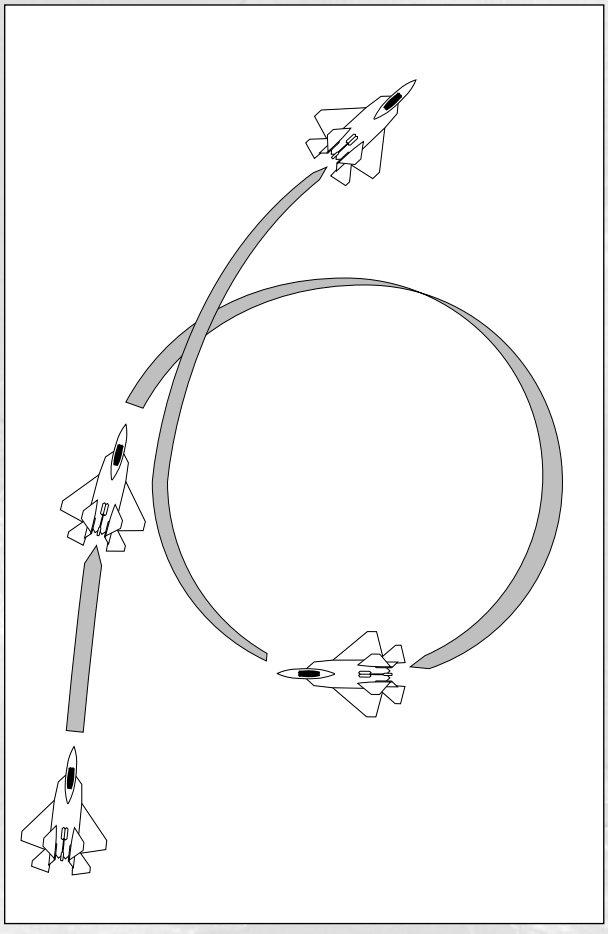
Air combat is a deadly contest in an ever-changing environment. To succeed, you will have to be well versed in the following advanced maneuvers. As the result, we strongly recommended that you practice these techniques before you engage your first bandit.

BARREL ROLL

Use the Barrel Roll when you are rapidly approaching a slow-moving target and want to stay behind it. To perform the Barrel Roll first direct you plane into a 30° climb. Pull the stick all the way to the right (or left) and back. Your plane will roll inverted then dive into the loop. Allow the plane to complete a full 360° roll and then gently pull the stick in the opposite direction of the roll, leveling your plane smoothly.

Minimum Altitude: 1,000 feet

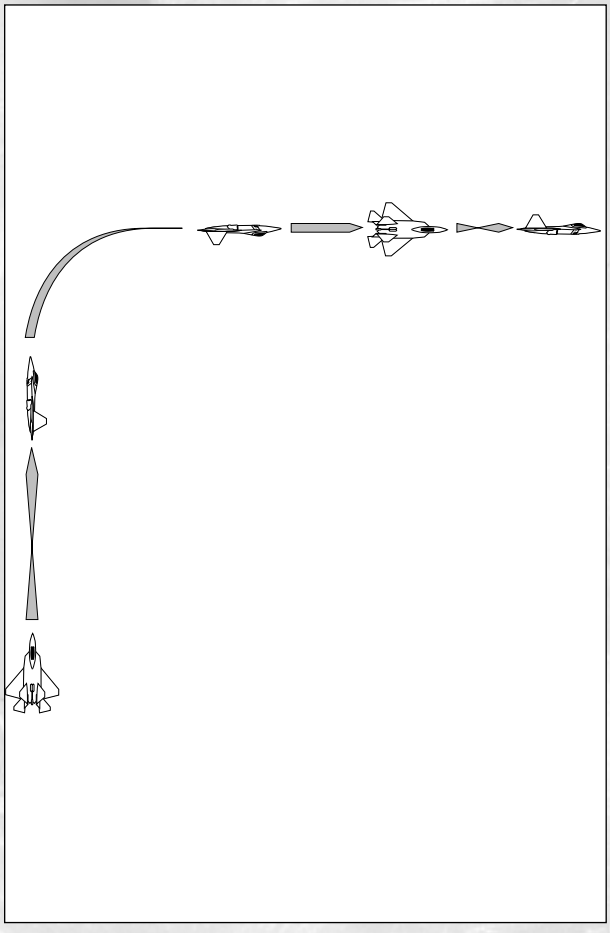
Minimum Airspeed: 450 knots



IMMELMANN MANEUVER

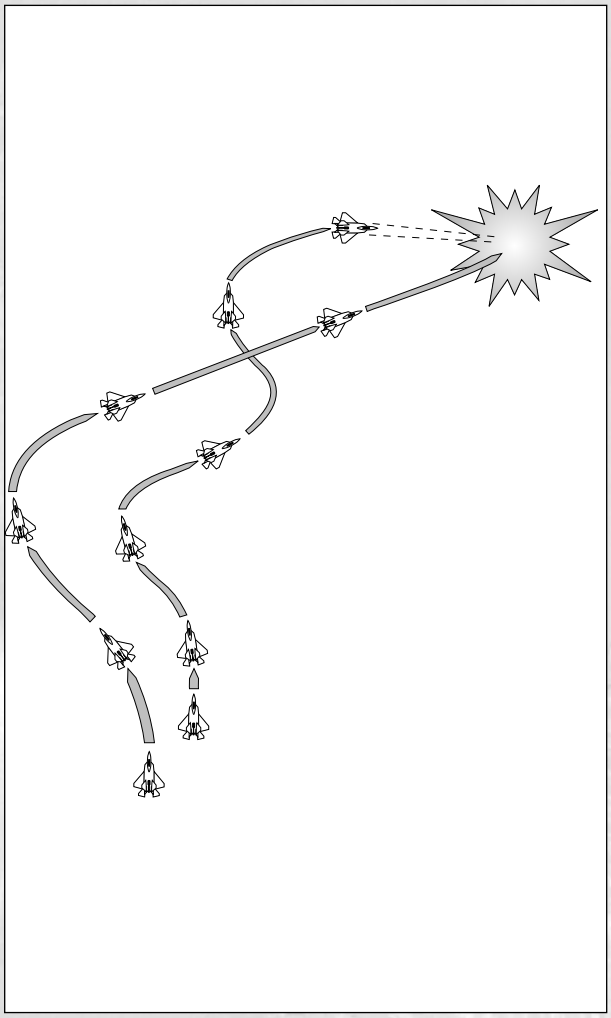
Use the Immelmann Maneuver to make a 90° turn, increase altitude, and reduce speed. To perform the Immelmann Maneuver start off from a straight and level position. Pull the stick all way back until you are completely vertical and pointing straight up. Then push the stick to the right (or left) for a 90° roll. At the desired altitude, pull back on the stick until the aircraft becomes level (although inverted). To complete the maneuver, execute a 180° roll by pushing the stick to the right (or left) until you are straight and level again.

Minimum Altitude: No minimum



ADVANCED MANEUVERS

Minimum Airspeed: 415 knots (full ordnance)
320 knots (no ordnance)



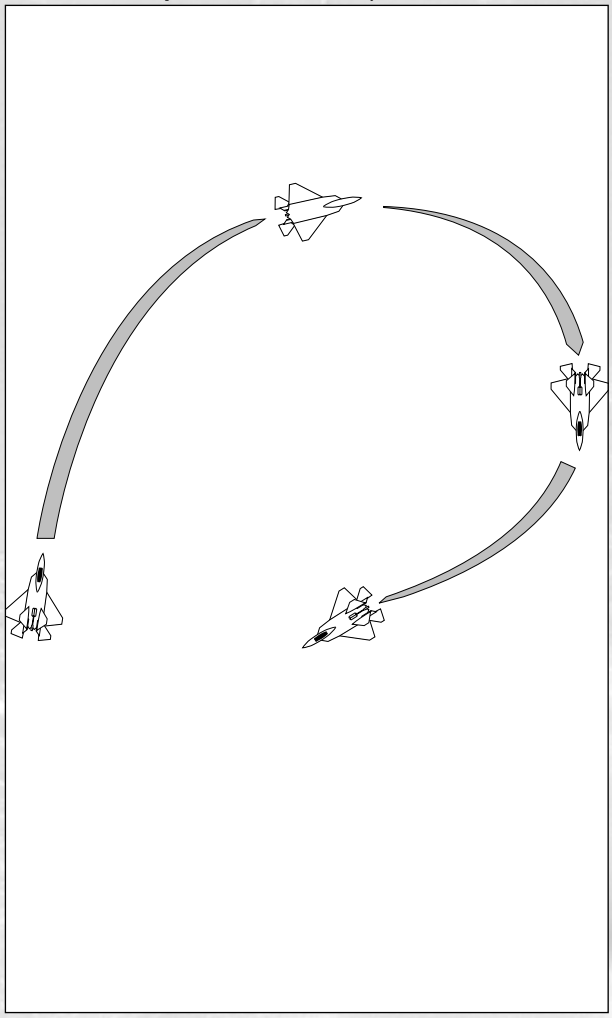
THE SCISSORS

Use the Scissors as a last ditch effort to try and get behind an opposing aircraft. The Scissors is a dangerous series of nose-to-nose turns and overshoots where each aircraft tries to get behind the other. The maneuver can be broken down into a series of “crossing” turns in which each pilot attempts to get his airplanes nose pointed at the enemy. Success in the Scissors usually goes to the slower plane which can make tighter turns.

Note: Be careful! The Scissors often results in a plane stalling from insufficient thrust.

Minimum Altitude: No minimum

Minimum Airspeed: As slow as possible



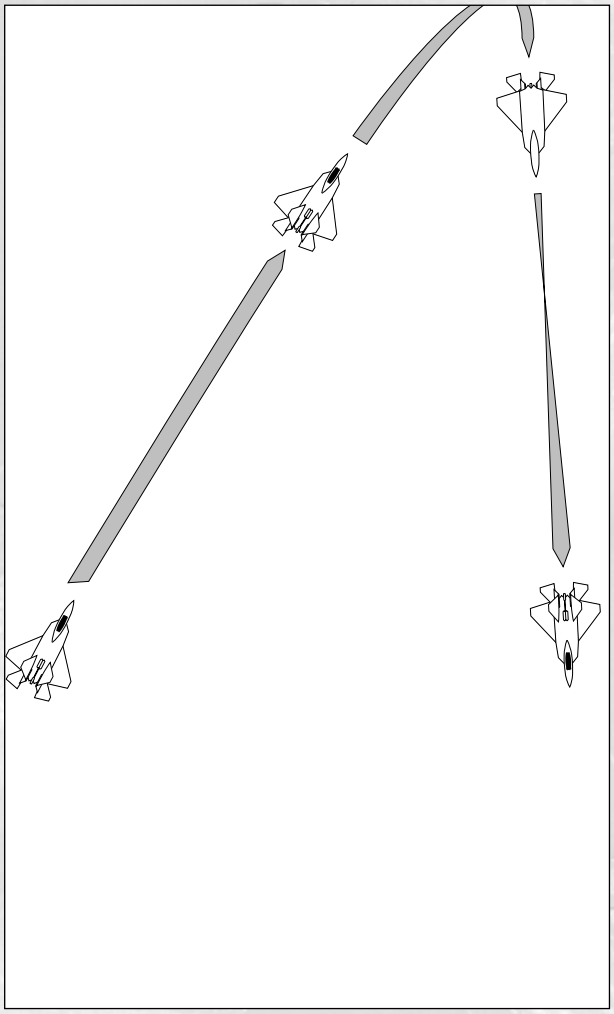
ADVANCED MANEUVERS

THE SPLIT-S

Use the Split-S to quickly change your direction 180°, lose altitude, and increase speed. To perform this Split-S, start off from a straight and level position. Then invert your plane by pulling the stick all the way to the right or left. Next, pull back hard on the stick, causing the plane to dive. Hold the stick until the plane levels out.

Note: This maneuver will lose considerable altitude, but you will lose less altitude if you keep your airspeed over 350 knots as you enter the dive.

Minimum Altitude: 12,000 feet (full ordnance)
3,500 feet (no ordnance)

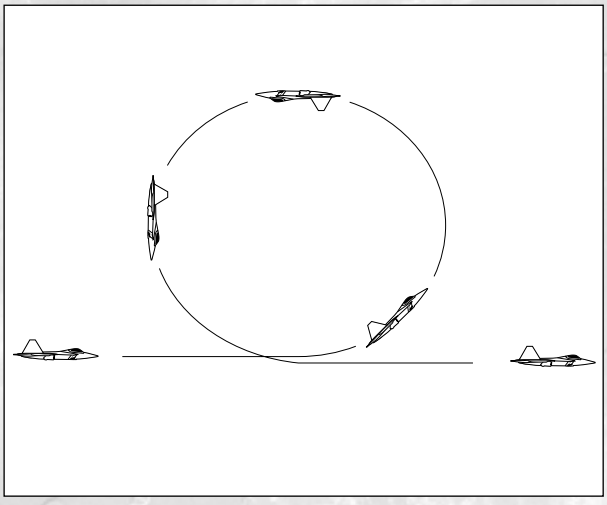


VERTICAL HALF-LOOP

Use the Vertical Half-Loop to change your direction 180°, increase altitude, and reduce speed. To perform the Vertical Half-Loop start from a straight and level position. Then pull back on the stick all the way. When the plane becomes fully inverted, level out by easing the stick to center. Lastly, roll the aircraft over by pulling the stick to the right (or left).

Minimum Altitude: No minimum

Minimum Airspeed: 415 knots (full ordnance)
320 knots (no ordnance)

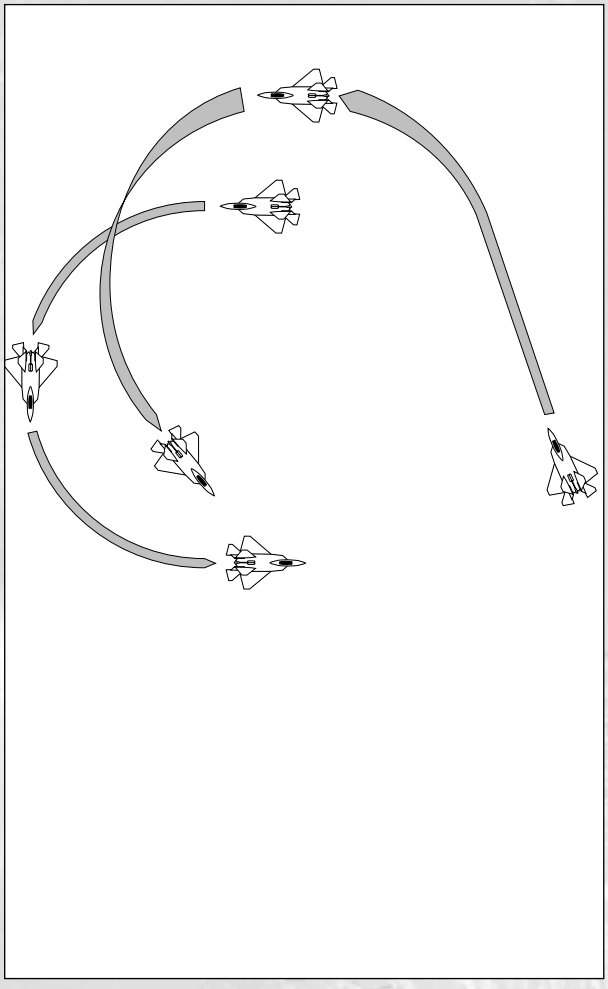


ADVANCED MANEUVERS/EMERGENCY PROCEDURES

VERTICAL LOOP

Use the Vertical Loop to avoid an enemy in your six while trying to get your guns on his tail all in the same maneuver. To perform the Vertical Loop, start from a straight and level position. Then pull the stick all the way back and hold it as the plane begins to climb and turn. When you finish the loop ease the stick forward, leveling your plane smoothly.

Minimum Altitude: 2,500 feet
Minimum Airspeed: 450 knots (full ordnance)
320 knots (no ordnance)



THE YO-YO

Use the Yo-Yo when you are behind a bandit but are not at the proper angle of attack. To perform the Yo-Yo, watch for the enemy to start breaking to the left (or right). Counter by gently following the direction of the bandit's turn and then pulling back on the stick into a tight turn. When performed correctly, you should still be behind the bandit except that your angle of attack has decreased. To increase your angle of attack, perform the same maneuver except in opposite.

Note: It is better to use a series of smaller Yo-Yo's than one big one. Larger Yo-Yo's might allow the bandit to escape.

Minimum Altitude: 2,500 feet (for the low Yo-Yo)
Minimum Airspeed: 450 knots (full ordnance)
320 knots (no ordnance)

STALL RECOVERY

An aircraft will stall when it reaches what is called the "critical angle of attack." This generally occurs when the plane is in a very steep climb. It is the result of inadequate lift which causes the plane to literally fall from the sky. This is a very dangerous situation: The plane is out of control and an alert enemy can destroy the helpless fighter. Consequently, quick recovery from a stall is critical.

If your plane has stalled, it will slowly start to fall. Warning bells and lights will also help alert you to the condition. To end the stall, air flow must be restarted. The simplest way to do this is to push the stick forward and let gravity take over. After a second of diving, you should be able to regain control.

Note: Stalls are extremely dangerous at low altitudes since there may not be enough altitude to recover.

SPIN RECOVERY

In today's high-performance fighters, spins are rare. However, they can still be deadly if they arise. A spin occurs when one wing goes into a stall while the other wing is providing lift. The result is a downward spiral toward the stalled wing. It usually occurs when a pilot tries to recover from a stall by applying his rudders.

Solving a spin is easy to do, but requires prompt action. Start by feeding rudder in the opposite direction of the spin to stop the rotation. As the spin slows, push the stick forward into a dive. This descent should re-establish the necessary airflow. Remember to start recovery early on since spins lose considerable altitude.

Note: Do not try to stop spins with the stick. It only worsens the situation.

EJECTION

The ejection seat allows a pilot to safely jettison from a damaged aircraft. It is essentially a lightweight rocket capable of operating at various airspeeds and altitudes. When all else fails, your life is important to the cause than the machinery.

The primary goal of jetfighters is to establish air superiority over enemy positions. Although it may seem obvious, air superiority is critical to a successful campaign. It provides better intelligence (while hampering enemy intelligence) and protects friendly ground units (while exposing enemy positions). In particular, the control of airspace during an engagement allows close air support, strategic and tactical bombing, reconnaissance and position reinforcement. This section examines the value of fighters in the military, concentrating on their various roles.

FIGHTER SWEEPS

A fighter sweep is a mission that is flown over contested territory for the purpose of destroying enemy aircraft. The classic situation is an limited offensive patrol over enemy lines, expressly searching for a fight. Any airborne aircraft is a valid target, but reconnaissance and supply planes are usually the most lucrative.

Fighter sweeps generally include two elements: high cover and low attack. The low attack planes focus on destroying targets near the ground while high cover fighters provide defensive protection. Cover may engage enemy fighters as well as reconnoiter enemy positions.

The targets of fighter sweeps are unlimited. Enemy air bases often make good targets (assuming that the low-level fighters carry some kind of ATG ordnance). Sweeps are also effective against reconnaissance aircraft like the AWAC. For the most part, however, the main goal is usually other fighters.

Because fighter sweeps usually take place over enemy positions, pilots have to be prepared for stiff resistance. As the result, sweeps have adopted “slash and dash” attacks (also known as hit-and-run). This approach requires the attacking planes to dive at high speed, attack the target, and then quickly disengage. It is not as exciting as a protracted engagement, but it does minimizes the fighters exposure. Alternatively, pilots sometimes use tricks to draw out enemy fighters away from their fortified defenses.
A classic example is flying the fighter sweep like a formation of bombers. If executed properly, this ruse will result in a nasty surprise for the bogeys.

POINT/AREA DEFENSE

In contrast to fighter sweeps which are purely offensive, point/ area defense is a protective posture. It is often used to safeguard valuable fixed assets like an air base, military compound or other structures. Pilots generally disfavor point/area defense orders since they are more tedious. However, they are essential in preventing enemy air strikes. Unlike fixed anti-aircraft weapons, jetfighters are more versatile. They can move quickly to counter a threat that is still far away from the intended target.

Point/area defense is classified into either combat air patrol (“CAP”) or ground-alert interception (“GAI”). CAP is a constant air patrol over or near a valuable target. It’s primary goal is to intercept incoming threats before they are close to the target. By contrast, GAI is a wing of fighters waiting on the ground, ready to scramble into combat. GAI is typically less costly than CAP, but it offers a much slower response time. As the result, military theory recommends the use of both CAP and GAI elements when possible.

Note: CAP is always preferred when the enemy is believed to possess long-range stand-off weapons such as cruise missiles.

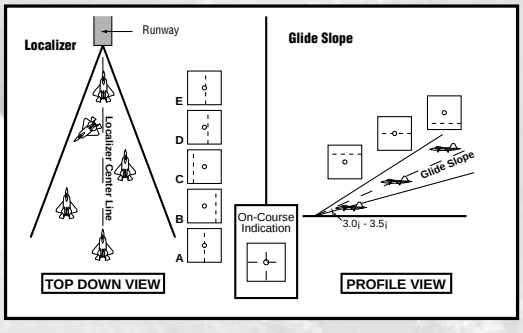
Protecting the target is the greatest priority of any point/area defense. It is not always as important to destroy the incoming bombers. In this case, a “kill” can be achieved by forcing an incoming bomber to jettison its ordnance early or by turning back the attack. (Of course, destroying the threat is the only sure way to keep it from returning the following day!)

MISSION TYPES / ILS AND CLS COMPOMENTS

When attacking a formation of bombers, there are several things to consider. First, watch for an escort. In most cases, a group of fighters will be flying cover nearby. If the formation is still far away from the target, you can try engaging the fighters first. This tactic will weaken the escort and may cause the bombers to abort the mission. But be careful. Many inexperienced pilots tend to forget the objective of point/area defense when they get involved in a big furball. Second, attack the bombers as soon as possible. By pressuring them early, you may discover a weakness. For example, many bombers are well defended in the rear, but are susceptible to head-on attacks. Third, exploit any weaknesses. If you see one aircraft which is more hesitant or unstable, attack that plane first. You will probably be able to destroy it easier. A “fast kill” is important because it will dramatically lower the rest of the formations morale.

STRIKE ESCORT

Many pilots feel that strike escorts are the most difficult kinds of missions to fly. They have the danger of fighter sweeps and the logistical problems of point/area defense. In fact, strike escorts have often been described as a sort of sweeping or “mobile” point/area defense. As such, the escort is responsible for securing the airspace around a friendly transport, bomber or other aircraft. This difficult assignment is complicated by the fact that the asset is often traveling in enemy airspace.



There are three types of escorts: remote, detached, and reception. A remote escort is essentially a fighter sweep which precedes the bombers. Flying ahead of the formation, its job is to clear out all enemy CAP and SAM positions. This assignment can be a difficult job since the target is usually a valuable asset with heavy defenses. After the path has been secured, the remote escort may then be divided into separate elements to fly patrols near the strike zone. They are then ordered to intercept any incoming bogeys.

A detached escort is comprised of several pairs of fighters stationed around the formation. They fly far enough away from the main body that they will be able to engage any offensive threat before it reaches the formation. This escort act as an early-warning system for the strike force, reporting enemy movements. They are obligated to stay with the strike force and cannot leave their positions except to respond to an attack. Conversely, they are required to return to the formation as soon as the threat turns away.

Note: Pilots flying a detached escort must hold their positions in order to protect the more valuable strike force.

After an attack, the strike force will be running low on fuel and weapons. At this stage they are very susceptible to attack. A reception escort is used to provide fresh cover to protect these returning aircraft. They begin by performing a sweep of the exit corridor, checking for enemy positions. This is then followed by a CAP around the corridor. While the strike force returns, the reception escort keeps an eye out for pursuing enemy aircraft. They are to engage these bogeys whenever necessary to protect the formation. This function is often performed by GAI units that were left behind to defense the point of operations.

Most pilots consider landings among their most challenging tasks. Even basic skills like finding the airport and aligning with the runway present difficulties. Pilots use Instrument Landing Systems (ILS) to simplify runway landings at airports. Identical systems aboard aircraft carriers are called Carrier Landing Systems (CLS).

ILS AND CLS COMPONENTS

TRANSMITTING EQUIPMENT

An ILS/CLS has five externally located components that transmit radio signals to your aircraft's navigation system:

Initial Approach Fix (IAF)1

Final Approach Fix (FAF)1

Terminal Waypoint (above the touchdown zone)2

Localizer

Glide Slope

The first three items are waypoints. Waypoints are navigation aids that guide pilots through the sky. Think of them as points in space your navigation system can sense. The navigation system displays information about how to find the waypoint. It indicates the waypoints distance and which direction you should turn to fly toward it. (See the section "Basic Waypoint Navigation.")

INITIAL APPROACH FIX

Approaches to the runway begin from the IAF. It lies 10 miles from the runway on an imaginary line that extends from the runway's centerline. Pilots use the IAF as a checkpoint to establish proper alignment and configuration for landing. An approach is off to a good start if several crucial factors are adjusted at the IAF: aircraft configuration (i.e. gear extended), airspeed, heading, and altitude.

FINAL APPROACH / TERMINAL WAYPOINT

Both the FAF and terminal waypoint lie along the same imaginary line as the initial approach fix. The FAF is 3 miles from the runway and the terminal waypoint lies over the touchdown zone. These waypoints serve as checkpoints during an approach. The terminal waypoint allows your navigation system to display your distance from the runway anytime during the approach.

LOCALIZER

Localizers are navigation aids that guide the pilot's lateral path as he approaches the runway. Unlike waypoints, localizers transmit a course, not a single point in space.

Think of the localizer as an extra sensitive instrument guiding pilots along a course between three waypoints: the IAF, FAF and terminal waypoints. These three points lie along the
localizers centerline.

GLIDE SLOPE

Like the localizer, the glide slope helps pilots find the runway. However, the glide slope provides vertical instead of lateral course guidance. Using the glide slope, a pilot can safely and precisely descend from his cruising altitude to the runway (see the above figure). This descending vertical path is called the glide slope.

ILS AND CLS COMPONENTS

INSTRUMENTATION

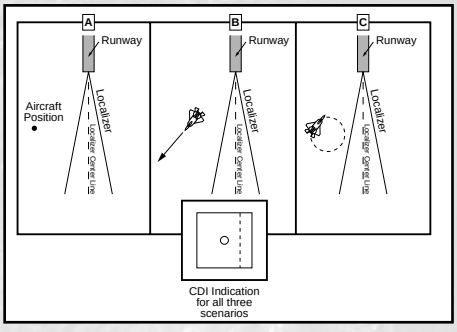
In addition to the five externally located components, the cockpit contains three receiving instruments that display course
information:

Navigation Director

Glide Slope Needle

Course Deviation Indicator (CDI)

Information from all of these components appears on your HUD:



NAVIGATION DIRECTOR

The navigation director depicts the location of the IAF, FAF, and terminal waypoints like any other waypoint (See flight training lesson #3). It simply “points” to the currently selected waypoint.

GLIDE SLOPE INDICATOR

The glide slope indicator is a horizontal dotted line that guides a pilot along the glide slope during an approach. The glide slope indicator moves up and down the HUD indicating your position relative to the glide slope. We say the glide slope indicator is deflected when it is not centered in the HUD. To help you center the indicator a small circle, called the Off Course Indicator (OCI), appears in the HUD when you activate the ILS.

Reading the glide slope indicator is simple:

When it is above the OCI, the glide slope is above you; you are TOO LOW.

When it is below the OCI, the glide slope is below you; you are TOO HIGH.

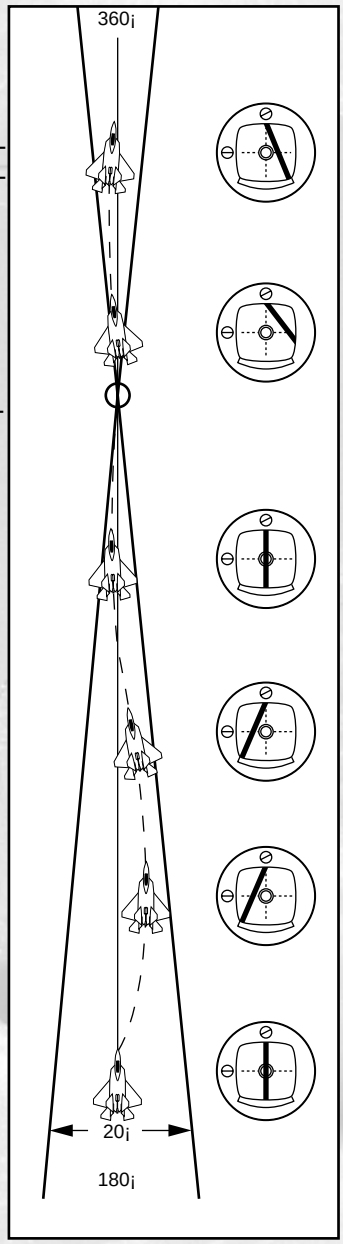
The magnitude of needle deflection indicates your distance from the glide slope. For example, a full-scale deflection to the top of the HUD indicates the glide slope is well above you.

COURSE DEVIATION INDICATOR

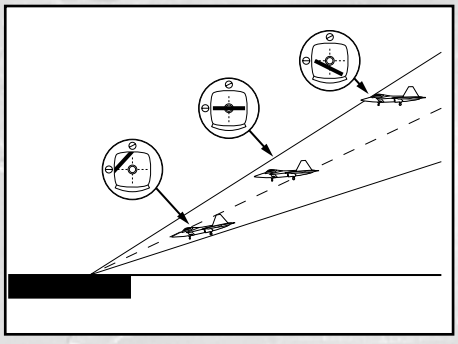
The CDI is a vertical dotted line on the HUD guiding the pilot to the localizers centerline. The CDI moves left to right indicating your position relative to the localizers centerline. Remember, the localizer centerline is an imaginary line that extends out from the runway.

Like the glide slope, both magnitude and direction of CDI deflection provide information about your location. The direction of CDI deflection indicates whether you are left or right of the localizers centerline. The magnitude of CDI deflection indicates your distance from the localizers centerline (see illustration on preceding page). For example, a full-scale CDI deflection to the left indicates that you are far right of course.

It is important to understand that the aircraft’s heading does not affect the CDI’s position; the CDI only changes when the aircraft’s position changes.



This subtle and important difference confuses many beginners. Imagine the CDI deflected to the right. It is correct to say, “you are to the left of course.” Conversely, it is not necessarily correct to say, “the course lies to your right.” This makes sense if you imagine a bird’s eye view of the approach with the runway near the “top” of your image. Visualize an aircraft positioned on the left side of the localizers centerline. The CDI’s location (deflected to the right) indicates that the localizer lies to the right. The following figure shows three different scenarios. Each scenario yields identical CDI indications.



Independent of your aircraft’s heading, the CDI needle remains deflected to the right since the aircraft is right of the localizer. However, most beginners don’t visualize the big picture resulting in incorrect CDI interpretations. They see the CDI deflected to the right prompting a right turn. Deceptively, the localizer is not necessarily to the right. Remember that the CDI provides course information—not turning information. A deflected CDI may prompt you to adjust your course (by turning), but you must decide on your own which direction to turn or if a turn is even necessary. Panel B above shows an arrangement where the localizer lies off the pilots left wing but the CDI is deflected to the right.

Most commonly, beginners err
by simply turning in the direction of CDI deflection. Often, this turn results in a circular path leaving the CDI unaffected (see panel C above). Instead of just turning, you should assume a heading that yields an intercept course with the localizer and this may involve a turn. In the following figure the deflected CDI merits no heading change. Initially, one may incorrectly turn right since the CDI is deflected to the right.

In fact, a right turn would further misalign the approach. The pilot should continue on his current heading.

The following diagram shows some possible aircraft locations and their corresponding CDI and glide slope indications.

The ILS/CLS may seem confusing at first but a few practice trials, along with the following suggestions and the ILS CHECKLIST (in the section “Using the ILS/CLS”) will make landings fun.

An entire ILS/CLS approach takes about 2 minutes and many events happen during this time. An approach to landing can be as intense as a close quarter dog fight. Approaches require sharp pilots who can anticipate every event and fly with much finesse. This section provides some pointers on performing successful ILS/CLS approaches. The ILS/CLS landing checklist presents much of this same information in a simplified form.

PRE APPROACH

Since all approaches begin from the Initial Approach Fix (IAF), you must first navigate to this waypoint. Place your HUD in
navigation mode by pressing [N]. “NAV” appears in the HUD’s lower left corner. Use [N] or [Shift-N] to cycle through waypoints until “IAF” appears in the HUD’s lower right corner. Fly towards the IAF as you would any other waypoint.

When you are between 20 and 30 miles from the IAF, configure your aircraft for landing. Extend your gear and arrestor hook by pressing [G] and [A]. (The arrestor hook is only necessary for carrier landings.) Turn the pitch ladder on by pressing [L]. Use the pitch ladder to establish specific pitch and bank angles making for a more precise approach. The ILS display automatically appears when you extend the gear and arrestor hook. For ground landings, you need not extend the arrestor hook.

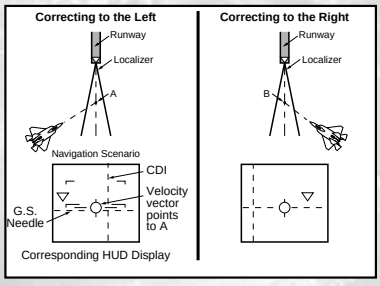
USING THE ILS/CLS

BEGINNING THE APPROACH

As you near the IAF pay special attention to your altitude. Approaching this waypoint at the correct altitude assures proper glide slope interception. By keeping the velocity vector EXACTLY in the center of the waypoint designator (the hollow triangle in the HUD's center), you will fly a direct course to the waypoint.

Three miles before the Initial Approach Fix perform these three tasks simultaneously:

- Set the power to 34% (by pressing [3] once and [+] four times)
- Select the FAF waypoint [N]
- Immediately turn towards it using a steep turn (45° to 90° of bank).



Many beginners get lost at this point. Simplify your turn towards the FAF by following these simple guidelines:

First, check the map display [M] before you are 1.0 mile from the IAF waypoint. The IAF, FAF, and carrier (or airport) waypoints appear as green dots on the map. Determine where these waypoints lie with respect to your flight path so you know which direction to turn when the time comes.

Second, after looking at the map consider re-aligning for the approach if turning from the IAF to FAF waypoint requires a large heading change (i.e. 180°). Large heading changes result in larger turns. Large turns cover more area over the ground. A 180° turn would grossly misalign the approach unless it were an extremely steep bank turn (thereby tightening the turns radius).

Third, as you roll wings level toward the next waypoint (FAF) begin looking for the landing strip. The navigation director triangle points directly at the carrier when you select the CVN waypoint. If you are landing at a ground runway, the triangle points to the runway when you select the airports waypoint.

TRACKING THE LOCALIZER AND GLIDE SLOPE

As soon as you roll wings level verify three conditions:

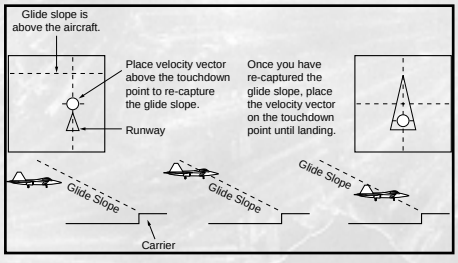
- You are heading in the general direction of the carrier (or airport).
- The glide slope indicator is approximately centered.
- The localizer lies slightly to your left or right (as indicated by the CDI).

Remember to pay attention to two CDI characteristics: direction and magnitude of deflection. The direction of deflection indicates the direction to the localizer (when viewed from a bird's eye perspective looking toward the runway). The magnitude of CDI deflection indicates your distance from the localizers centerline.

Correct toward the localizer and glide slope as soon as you determine where they are. These corrections, like all corrections from here on in, should be subtle and precise; nearly all beginners over-correct. The localizer and glide slope are more sensitive than waypoints. Therefore, people tend to "overshoot" their desired course.

Avoid over-corrections by following three guidelines:

- First, make small shallow turns using only the rudder ([X] and [Z]). Ailerons are great for steep tight turns, but making small heading changes using rudder and ailerons is more difficult. Only use the ailerons to keep your wings level.
- Second, use the navigation director while making corrections toward the localizers centerline. The waypoint triangle (in the center of the HUD) always points at the landing point when the CVN or airport waypoint is selected. Furthermore, the CDI always deflects toward the localizer. Therefore, you will always be approaching the localizer if you place the velocity vector between the CDI and the CVN waypoint.
  The following picture illustrates why this works.



USING THE ILS/CLS

- Third, use the velocity vector, airspeed, angle of attack, pitch, and/or descent rate information while tracking the glide slope. Obviously, you cannot use all of this information simultaneously. Experiment and see what combination works best for you. Of this list, your single most valuable tool is the velocity vector.
- Since the velocity vector displays your direction of travel, you can simply place it on the point where you want to go—like the touchdown point on the runway. However, if you are off course (i.e. the CDI and glide slope indicator are not within the OFF COURSE INDICATOR) you must correct your course.

For example, if you are below the glide slope, place the velocity vector above the touchdown point until the glide slope indicator re-centers in the OFF COURSE INDICATOR. Likewise, if you are too high (the glide slope indicator is below the OFF COURSE INDICATOR), place the velocity vector below the touchdown point. Once the glide slope indicator centers, place the velocity vector back on the touchdown point.

At 34% power, the following configuration results in an approximate 3° glide slope (the angle at which the glide slope approaches the ground):

Airspeed: approx. 165 KIAS

AOA: 4° to 6°

Pitch: approx. 0°

VSI: approx. -24 F/S (-1440 FPM)

You don't need to monitor and maintain each parameter independently; by achieving any one of them you necessarily achieve them all (once the aircraft stabilizes). Also, once you "capture" the glide slope, simply placing the velocity vector on the touchdown point keeps you on course and only a few minor pitch adjustments will be necessary. This is only true at 34% power.

If you ever stray from the desired glide slope (the glide slope indicator is not within the OFF COURSE INDICATOR), you can pitch up or down to re-capture it. However, the configuration outlined above pushes your aircraft to the edge of its performance envelope. Hence, abrupt or excessive control movements induce a stall. Make small, slow corrections while mending your course.

If you stray excessively far above or below the glide slope, momentarily adjust your power (increase to climb, or decrease to descend) or perform a missed approach. A missed approach entails aborting the current approach and re-setting for another attempt.

Approaches are identical whether you are landing on the ground or carrier. However, the landings differ slightly.

GROUND LANDINGS

Ground landings are more simple than carrier landings. Cut the power about 0.3 miles before touchdown [~]. As the engine spools down (almost immediately), add a SLIGHT amount of joystick back pressure to initiate a flare. A flare is the transition from flight to ground operations. Ideally, it begins about 70 feet above the runway and continues until touchdown. Throughout a flare your pitch should be slowly and smoothly increasing while your descent rate and airspeed diminish. By the time you touch down, you should be at a pitch that allows your main landing gear (the two back tires) to touch the ground before your nose gear. Perform a flare by momentarily pressing [Numpad 2] or GENTLY pulling back on the joystick. After touchdown apply the wheel brakes [B] and slow to a stop. Use the rudder pedals to steer ([Z] and [X]). Once you perfect ground landings (see training mission #8) it's time to move onto carrier traps (training mission #9).

CARRIER TRAPS

Rough seas, the carrier's motion, and the deck's length make carrier traps one of your most difficult tasks as a JetFighter IV pilot. Ideally, your arrestor hook will trap the third arresting cable. This means that the arrestor hook actually snags the cable stretched across the landing strip. Unfortunately, bolters often happen instead. A bolter occurs when the arrestor hook fails to snag one of the cables stretched across the carrier's deck. Bolters happen for many reasons including improper runway alignment or faulty equipment.

Unlike ground landings, do not flare! Strange as it seems, pilots fly right into the deck during carrier landings. A flare would sacrifice valuable airspeed and deck space. Also, hitting a specific landing point (i.e. the third arresting cable) is easier without a flare.

USING THE ILS/CLS

Prepare for bolters on every approach (even on perfect approaches) by applying full afterburner [\] about 1,000 feet before touchdown. The afterburner allows you to maintain enough speed for flight in case a bolter occurs. If you trap the arresting cable, cut the power [~]; otherwise apply full power and reset for another approach.

It will take some practice before your landings are beautiful, but the thrill of your first successful landing will make it all worthwhile.

ILS/CLS LANDING CHECKLIST

PRE-APPROACH CHECKLIST

Landing Gear: Extend [G]

Arrestor Hook: Extend (for carrier approaches) [A]

Pitch Ladder: ON [L]

HUD mode: Navigation mode [N]

Waypoint Selection: press [N] until "IAF" appears in the HUD

IAF WAYPOINT CHECKLIST—PERFORM 1 MI BEFORE WAYPOINT

Power: 40% - 42% (press [4], then [+] zero to two times)

Waypoint selection: Select FAF waypoint ([N] or [Shift-N])

Turn: 45°-90° bank turn toward FAF waypoint

ILS/CLS: Align with localizers centerline, maintain glide slope

FAF WAYPOINT CHECKLIST—PERFORM AT LEAST 1 MI BEFORE FAF

Waypoint selection: Select terminal waypoint [N]

Velocity Vector: On touchdown point

Pitch: 0° - +3°

Airspeed: approx. 200 KIAS

AOA: 4° to 6°

VSI: approx. -30 F/S

TOUCHDOWN CHECKLIST—CARRIER APPROACHES

Power (1,000 ft before deck): Full Afterburner [\]

Power (trap): 0% [~]

TOUCHDOWN CHECKLIST—RUNWAY APPROACHES

Power (1,000 feet before touchdown zone): 0% [~]

SIMULATION REFERENCE

If you have not done so yet, please read the Common Procedures chapter first.

This reference section contains the most important information on flying and fighting in *JetFighter IV*. It explains the navigational controls, combat controls, cockpit and viewing systems.

If you are familiar with other flight simulators, first read the chapter titled Procedures. It will quickly instruct you to perform common tasks in *JetFighter IV*, such as engaging a target or using the ILS landing system. This reference section is laid out as a basic reference to use when you need more detailed information.

JetFighter IV: Fortress America allows the player to use both a keyboard and a joystick as input devices. Although use of a joystick is recommended in order to gain full advantage of *JetFighter IV*'s realistic flight model, you should have no problem operating the game's flight simulator entirely from the keyboard.

FLIGHT CONTROLS

JOYSTICK

You can use a joystick to maneuver your airplane in *JetFighter IV*, in the same way a real pilot would. Your joystick will operate just like they do in an actual fighter. If you pull back on the stick, the plane will go up; if you pull left on the stick, the plane will roll to the left.

KEYBOARD

The keyboard is your main way for you to navigate your plane. In general, pressing a key on the keyboard can do one of three different things. It will:

- begin or end an action (i.e., lower landing gear);
- cycle through available options (i.e., change displays); or
- make a decision (i.e., fire a weapon).

Occasionally there are some special commands that *JetFighter IV* will want to "confirm" before executing. For these commands, the program requires that you hold down the "Shift" or "Ctrl" key along with the key. *JetFighter IV* uses this combination of keystrokes to make sure an action is not accidentally performed.

FLIGHT CONTROLS

The flight controls are used to maneuver the aircraft in the air and on the ground. All the flight controls can be operated from the keyboard but if you have a joystick, throttle control, and rudder pedals, controlling the aircraft will feel natural and be more intuitive.

DIRECTIONAL CONTROLS

The numeric key pad (or "Numpad") arrows enable you to change the direction of your plane in flight. These keys allow you to pitch the airplane up and down, roll it right or left, and yaw it to either side. Some keyboards have separate cursor arrow key pads. These keys should work just like the Numpad arrow keys.

PITCH UP (CLIMB) - [NUMPAD 2]

When airborne press the [Numpad 2] key to pitch the aircraft's nose up. This is exactly what would happen if you pulled backward on the plane's stick. To perform an "Upward Vertical Loop" hold down the [Numpad 2] key until your plane completed a full circle.

PITCH DOWN (DIVE) - [NUMPAD 8]

When airborne press the [Numpad 8] key on the numeric pad to pitch your aircraft's nose down. This corresponds to what would happen if you were pushing forward on the plane's stick. To keep the plane in a dive, continue holding down the [Numpad 8] key. By depressing the key until your plane has completed a full circle, you will have performed a "Downward Vertical Loop".

ROLL RIGHT - [NUMPAD 6]

Pressing the [Numpad 6] key on the numeric keypad while on the air will roll or "spin" your plan to the right. This is what would happen if you were pulling the airplane's stick to the right. To keep rolling your plane to the right, continue to hold down the [Numpad 6] key. By depressing the key until your plane has finished the complete roll, you will have performed a "Right Barrel Roll." Pressing [Numpad 6] while you are taxing on the ground will steer your plane to the right.

ROLL LEFT - [NUMPAD 4]

Pressing the [Numpad 4] key on the numeric keypad while on the air will roll or "spin" your plan to the left as would happen if you were pulling the airplane's stick to the left. To keep rolling your plane to the left, continue to hold down the [Numpad 4] key. By depressing the key until your plane has finished the complete roll, you will have performed a "Left Barrel Roll." Pressing [Numpad 4] while you are the ground will steer your plane to the left.

YAW RIGHT - [NUMPAD Enter]

When airborne press the [Numpad Enter] key on the numeric keypad will turn or "yaw" the plane to the right. This is exactly what would happen if you pushed down the plane's right rudder pedal. To continue turning the plane right, hold down the [Numpad Enter] key. If you continue depressing the key, the plane will fly to the right in a full circle. For convenient, the [X] key performs the same function. As with the [Numpad 6] key, pressing either [Numpad Enter] or [x] will steer your plane to the right while taxing on the ground

YAW LEFT - [NUMPAD Ins]

Pressing the [Numpad Ins] key on the numeric, while in flight, will turn or "yaw" your plane to the left. This is exactly what would happen if you were pushing down on the plane's left rudder pedal. To continue turning your plane left, hold down the [Numpad Ins] key. If you continue depressing the key, your plane will fly to the left in a full circle. For convenience, the [z] key also performs this same function. As with the [Numpad 4] key, pressing either [Numpad Ins] or [Z] will steer your plane right while taxing on the ground.

Note: New users often confuse roll and yaw. Just remember that a roll is like tilting your head while yaw is like turning your head right or left.

ENGINE CONTROLS

JetFighter IV uses very simple engine and throttle controls. The row of number keys near the top of your keyboard is used as a throttle control to set the level of thrust in your engine. (Be sure not to confuse the number keys with the function keys.) Some players may also wish to use a separate throttle control device designed specifically for use with flight simulators rather than the number keys.

ENGINE CONTROLS

THROTTLE SETTINGS

In the military, a jet aircraft's throttle setting is referred to as a percentage of total Military (non-afterburner) power. That is, when the engine is at maximum power with the afterburners off, it is said to be at 100% Military Thrust. The number keys along the top row of your keyboard enable you to set your engines at a specific percent of military power.

[1] = 10% of full military power

[2] = 20% of full military power

[3] = 30% of full military power

[4] = 40% of full military power

[5] = 50% of full military power

[6] = 60% of full military power

[7] = 70% of full military power

[8] = 80% of full military power

[9] = 90% of full military power

[0] = 100% of full military power

THROTTLE ADJUSTMENTS - [-] & [+]

For fine control over engine power, use the [+] and [-] keys on the top of the keyboard. These keys enable you to slowly add [+] or remove [-] power in 1% increments. Hold these keys continuously to gradually increase or decrease power.

Note: It is not necessary to hold the shift key in combination with the [+/=] key. Simply pressing the [+/=] key will perform the [+] function in *JetFighter IV****.***

AFTERBURNERS - [+]

In a tough dogfight, an extra burst of speed may be all that stands between you and destruction. Modern fighters are equipped with afterburners to provide just this sort of lifesaver. Activating your afterburners causes raw fuel to be dumped into the plane's hot exhaust. The resulting explosion initiates a powerful thrust, but it is costly. For instance, at full afterburner, the F-22 will consume an amazing 860 pounds of fuel per minute! To help conserve fuel, and adjust your relative speed and control, your plane comes with a "5 stage" afterburner. Each stage gives a more powerful thrust and consumes more fuel than the one previous to it.

To activate your afterburners, you must already be at 100% military power [0]. You can then move up to the first stage of afterburner by pressing the [+] key. For example, if you are at 70% thrust and you want to activate your afterburners, press [0], wait for you engines to spool up to 100% power, then press [+]. You are now flying at first stage afterburner or "AB1." To move to the next higher afterburner level press [+]. To decelerate to the previous stage, press [-]. Remember, the higher levels of afterburner consume more fuel. To turn the afterburners off, press [0]. Your engines will then resume full military thrust.

FULL AFTERBURNER - [\]

In *JetFighter IV* there is a quick and easy way to get to full afterburner. Press [\] and your engines will automatically spool up to 100% military thrust, then cycle into stage 5 afterburner. You may find this control useful to make a quick escape from a particularly nasty fur ball!

ENGINES OFF -[~]

You can turn your engines off by pressing the [-] key. Pressing any of the throttle keys (i.e. [1] through [0]0 or [\]) will automatically restart your engines and set them at the indicated thrust level.

OTHER CONTROLS

Several other controls can affect the performance of your aircraft in flight and on the ground.

AIR BRAKE -[B]

The air brake is used to rapidly slow the aircraft while flying. To apply the brake, press the [B] key. The plane will immediately begin decelerating. On most aircraft, the brake opens a panel into the air stream causing more "drag." Drag slows the plane. If you are flying the F/A-18, try an external view to watch the brake extend and retract. Pressing [B] again will retract the air brake.

Note: Using the brake may make your aircraft more difficult to control, so be sure to retract the brake when it is no longer needed.

WHEEL BRAKE - [B]

On the ground, pressing the [B] key applies the wheel brake. The wheel brake works just like the brake in a car. Be careful, the wheel brake is inoperable at high speeds and you must instead reduce your thrust to slow down.

Note: If the wheel brake is activated you must release it to enable the plane to take off! Also, don't use the wheel brake for carrier landings! Let the arrestor cables do the work.

LANDING GEAR - [G]

The plane's landing gear consists of three wheels placed beneath the aircraft in a triangular pattern. Fully retractable and deployable, the landing gear is concealed in a cavity within the plane's belly. After take-off, retract your landing gear by pressing [G]. Likewise, extend the gear for a landing by pressing [G].

AUTOPILOT - [SHIFT-A]

To engage the autopilot, press [Shift-A]. The aircraft will begin to turn and fly toward the currently selected waypoint. You will see "autopilot" appear in the lower right of the screen. To disengage the autopilot, press [Shift][A]again. The autopilot will also automatically disengage if you change the waypoint with the [N] or [Shift-N] keys. When the aircraft reaches the currently selected waypoint, the autopilot will select the next waypoint and fly to it. This process will continue until autopilot is disengaged.This system is not designed for precision approaches, so do not try to use the autopilot function to land your aircraft.

ARRESTOR HOOK - [A]

Landing on an aircraft carrier demands an aircraft traveling at over 100 MPH to come to a dead stop on just a couple hundred feet of runway. To do so, the planes are "trapped" by the aircraft carrier's arrestor cables. A plane performs a trap by lowering its arrestor hook and successfully catching one of three cables strung across the flight deck. The "trapped" cable then pulls the plane to a stop. Deploy the arrestor hook for a carrier landing by pressing [A]. If you abort your landing attempt, press [A] again to raise the hook.

EJECT - [CTRL-E]

Although no military force is thrilled with the idea of losing one of its fighter aircraft, either one would rather lose a plane than a pilot. As a result, every fighter is equipped with a sophisticated ejection seat designed to throw the pilot free from a damaged aircraft. The seat includes emergency oxygen, a recovery parachute, an FLCS data recorder, a survival kit, and a radio beacon. The ejection process begins when you press [CTRL-E]. Explosive charges under the seat throw it (with the pilot) clear of the airplane. This is followed by a rocket burst to gain altitude, seat separation and full deployment of the parachute - all in less than six seconds! Some pilots have claimed to be two inches shorter after an ejection.

TIME COMPRESSION - [ALT-T]

Some missions require you to fly several hundred miles. If you want to speed up the cross-country flight and get right to the action use *JetFighter IV*'s Time Compression feature.

The time compression feature enables control over the rate at which the simulated "world" operates. Use the in-flight menu or press [Alt-T] to toggle through the three speed selections. The default time compression setting is 1:1 or "real time". Press [Alt-T] once to make the simulator run at twice the speed or 2:1. Press [Alt-T] again to speed the simulator up to 3:1. Toggle [Alt-T] one more time to disable time compression and run the simulator in real time.

Naturally, time compression enables you to cover a distance in one half or one third the time but it has drawbacks requiring careful use. When time compression is activated EVERYTHING in the simulator will operate faster than the normal speed but your brain will still be working in real time. Until you become accustomed to the problems this can cause use time compression only when flying very high above the terrain.

Note: Time compression will automatically be deactivated if your radar identifies a hostile.

LANDSCAPE TRAVERSAL MODE - [ALT-S]

Landscape Traversal Mode was created to provided a way to move from one location to another at eight times the current "real time" speed of the aircraft.

This mode differs from Time Compression because only your plane is moving faster. The simulated world still functions in real time. Additionally your altitude above sea-level is locked to the altitude you were flying when landscape traversal mode was activated. Extreme caution must be exercised when using this mode or you will soon find yourself flying into the side of a mountain. It is best to activate landscape traversal mode only when high above the terrain.

Note: This feature is only available in "Free Flight" mode.

THE INSTRUMENT PANEL

COMMUNICATIONS MESSAGE PANEL

Occasionally the plane's onboard computer will send you a status message. These messages are displayed on the message panel located at the top center of your cockpit control panel, directly beneath the HUD. Messages are usually one or two word reports such as "Danger: Collision." Longer messages from non-player characters are displayed at the top of your computer screen.

ATTITUDE INDICATOR

The attitude indicator continuously displays your orientation relative to the ground. Often referred to as the "artificial horizon" indicator, this gauge will help you remain oriented when you have few visual cues to rely on. In clouds, dense fog, or at night it is easy lose track of which way is up. You may feel as though you are right-side up when you are actually upside down. Frequently check the attitude indicator if you are not 100% certain you see ground beneath you and sky above. Trust your instruments! Reading the attitude indicator is simple. The blue portion represents sky, the brown portion represents ground, and a small white icon in the center represents your plane. When flying level to the ground and right-side up the indicator will display sky above and ground below. When flying level to the ground and upside-down the indicator will display ground above and sky below. If you fly directly up the indicator will display all sky and if you fly straight down the indicator will display all ground.

FUEL GAUGE

The fuel gauge continuously displays the amount of fuel remaining in the aircraft just like the fuel gauge in a car. You will find the fuel gauge located in the far right side of the cockpit control panel. The green bar represents the amount of fuel remaining.

MULTI-FUNCTION DISPLAYS (MFD)

DEFENSIVE DISPLAY - [F5]

The Defensive Display has two modes, Flight Information and ILS/CLS. You can toggle between modes by pressing [F5].

FLIGHT INFORMATION MODE

Flight information mode relays current information concerning the aircraft's altitude, speed, heading, and the time of day. Also reported are your current latitude and longitude in degrees, minutes and seconds.

INSTRUMENT/CARRIER LANDING SYSTEM

This mode of the Defensive Display presents information on the instrument and carrier landing system (known as "ILS" and "CLS" respectively). Like the graphical displays in the HUD, this data is designed to make landings safer and easier. This screen tells you three valuable facts about your approach: (1) your range to runway, (2) change in altitude, and (3)angle of attack.

The range to the authorized runway is shown in the monitor next to "RNG." This distance is displayed in nautical miles Beneath it is the plane's vertical descent (or "VRT") in feet per second (or "F/S"). This number tells you how fast the aircraft is descending. The third number is the angle of attack or "AOA". This guide represents the wing's position relative to the direction of the wind. To illustrate this concept, consider the following example. If a plane is flying directly against the wind, its AOA is 0°.

Wind Plane = 0° AOA

But, when the pilot pulls back on the stick, the air continues to flow horizontally for a few seconds even though the wing is angled upward. This results in a positive AOA.

Wind Plane = 15° AOA

After a few seconds of flight, the airflow will realign itself with the new angle of the wing. Once again the airflow is directly against the wing. The plane is then said to have regained a zero degree AOA.

Wind Plane = 0° AOA

During a landing, you should try to obtain an 8° angle of attack. This is angle is important because you want the rear wheels to touch down before the nose. It is best achieved by pulling back slightly on the stick just before landing.

HORIZONTAL SITUATION DISPLAY - [F6]

The screen in the middle of the instrument panel is the Horizontal Situation Display (or "HSD"). It is a highly sensitive integrated radar system that enables you find and track targets in a 360° view. It combines the advantages of a traditional radar with radar-warning receivers, global positioning systems and AWACS links. Always active, the Horizontal Situation Display can be viewed by pressing [F6].

The radar screen is dominated by a large circle with an "aircraft symbol" in its center. The white "T" represents your plane and the circle depicts the radar's current range. If, for example, the range is set at "10," then the circle represents a ten mile radius around the plane. Any target located within this radius will appear on the radar. The radar's default range is "40." To change the range, press [R] and [Shift-R]. This allows you to choose from ranges of 160, 80, 40, 20, 10, 5, 2 or 1 mile. If you have AUTORANGE enabled, the computer will automatically select the radar range that keeps your target within that radius.

Note: You probably should use a range of either "2" or "1" duing a dogfight.

If a target is within the range you have selected, it will appear as a dot or "blip." The blip's position in the radar corresponds to its position in space. For example, a blip at the top of the radar means that the target is directly ahead of the plane (or "twelve o-clock").

Likewise, a blip on the left side of the radar means that the target is directly to the left of the plane (or "nine o'clock").

The color and size of the dots also provide information about the target. Each color designates different kinds of objects. The colors stand for:

Red = enemy

Green = friendly

Gray = unidentified

White = missile

Brown = navy craft (such as a carrier)

The size variations also tell you where a target is located relative to your position. For instance, a large dot (or "o") indicates that the target has a higher altitude, whereas a smaller dot (or "o") means that the target is below you.

To choose a target for combat, cycle through the dots by pressing [T] and [Shift-T]. The currently selected target will appear encircled and its status will be displayed in the lower left-hand corner. Once chosen, the radar will track this target in the HUD with the large green target designator box.

The tracking computer will then identify the target and show its posture (friendly is green and enemy is red). The target's current altitude (in feet), speed (in knots), and heading (in degrees) are also reported.

Note: The HSD is duplicated in the On Screen Radar for convenience.

OFFENSIVE DISPLAY - [F7]

The Offensive Display has two modes: Navigational Info and Air Target. To activate any system, press [F7] until that heading appears in the top of the screen. Each of these systems are discussed below.

NAVIGATIONAL INFO

This mode displays the mission's "waypoint" list. Waypoints can be thought of as a series of check points over which you must fly. Waypoints can also represent ground targets or your aircraft carrier. Your orders will instruct you as to your duties at each point.

The waypoints are listed in the order they should be followed. Each position has a name, heading, and distance. To cycle through the waypoints, press [N] and [Shift-N]. The currently selected waypoint will be a brighter green color than the rest of the list. Ground targets that have been designated as waypoints will be red. The names frequently use abbreviations:

WPT1 First waypoint

WPT2 Second waypoint

IAF Initial Approach Fix

FAF Final Approach Fix

CVN Aircraft Carrier (Nuclear)

For example, the third waypoint says "IAF - 177° - 4.0 nm." This means that after you have gone to the second waypoint you should fly to the Initial Approach Fix to prepare for final approach. The Initial Approach Fix is located 4 nautical miles away at a heading of 177 degrees. After that point, you should fly to the final approach fix (FAF) and then land at the carrier (CVN).

AIR TARGET

Information about the currently selected air target is also displayed in the Offensive Display. To cycle through available air targets, press [T] and [Shift-T]. Once a target is selected, its status is shown in this screen. The tracking computer will then identify the target and show its posture (friendly is green and enemy is red). The target's current altitude (in feet), MSL speed (in knots), and heading (in degrees) are also reported.

SYSTEMS DISPLAY - [F8]

The bottom screen is called the System Display. It is where you receive critical systems and weapons information. This display contains data on several systems, including Thrust, Fuel, ECM, Weapons, Countermeasures, Gear, Brake, and Hook.

THRUST INDICATOR

This indicator show the aircraft's current thrust setting as a percent of full military thrust. You can change the engines' setting by pressing any of the number keys (i.e., "6" is 60% of full military thrust). It will also show when the engines have engaged their afterburners. This is displayed as AB1 through AB5.

FUEL GAUGE

The fuel gauge shows how many pounds of fuel remain aboard your aircraft.

ECM JAMMING - [J]

Modern jetfighters come equipped with sophisticated electronic countermeasure systems. These systems send out electronic signals to "jam" or confuse incoming missiles. Electronic countermeasures can be turned on and off by pressing the [J] key. When activated, the "ECM" light will appear on the screen.

WEAPONS - ATA: [ENTER] & ATG: [BACKSPACE]

This indicator in the middle of the display show which weapons are armed. In this example, the Sidewinders have been armed and are ready to fire. To select an Air-to-Air weapon, press [Enter] or [Shift-Enter]. This will scroll the display through the choices. To select an Air-to-Ground weapon, press [Backspace]. When you selected the weapon you want, press [Spacebar] to fire.

HEADS UP DISPLAY

COUNTERMEASURES - [C] & [F]

Although ECM can be effective against some weapons, experience has shown flares and chaff are more effective countermeasures. Their stores are tracked on this screen. You can fire chaff or flares by pressing [C] and [F] respectively.

As a rule, landing gear should always be raised during flight and lowered for a landing. However, it is impossible to see the landing gear when you are sitting inside a plane. This display includes a warning light to tell you when the gear is up or down. To raise or lower the landing gear, press [G].

FLAPS - [CTRL-F]

The flaps are controlled with [Ctrl-F]. Extending your flaps will allow you to stay airborne at a slower speed, thereby making landings easier. You will see an indicator in the upper right of the HUD when your flaps are extended. This indicator will flash red when you are exceeding the recommended airspeed for flight with flaps extended

SPEED BRAKE - [B]

The speed brake allows you to rapidly slow down your airplane. To activate or release the brake, press the [B] key. When the speed brake is activated, the word "BRAKE" will appear in the bottom of the screen in red.

ARRESTOR HOOK - [A]

Carrier landings require the plane's arrestor hook to catch a cable strung across the flight deck. However, it is impossible to see the arrestor hook when you are sitting inside the plane. This display includes a warning light to tell you when the hook is deployed. When the hook is down, the word "HOOK" will appear in the bottom of the screen in red. To deploy or retract the arrestor hook, press [A].

THE HEADS UP DISPLAY (HUD)

In the heat of battle, disorientation is as much your enemy as the bandit shooting at you. At fighting speeds you can travel miles in the time it takes to check a couple instruments. During maneuvers the world can look completely different from instant to instant and reorienting yourself to your surroundings can cost precious time. The Heads Up Display was created to enable a pilot to keep his eyes on the action and at the same time receive crucial information provided by instrumentation.

The heads up display is a diagonally mounted piece of glass with control information projected upon it. In practice it provides the pilot an enormous wealth of information without looking down at the instruments.

HUD BRIGHTNESS CONTROL [H] or [SHIFT-H]

HUD Brightness Control [H] or [Shift-H]The brightness of the HUD is controllable for different environments. During the day the display may be difficult to see against the terrain unless it is set to one of its brightest settings. Conversely, dim the HUD while flying at night to keep your eyes sensitive to the dark terrain.

ON-SCREEN RADAR

While not actually part of the HUD the on-screen radar is provided for the *JetFighter IV* pilot who does not wish to repeatedly look down to check the horizontal situation display. The on-screen radar operates exactly like the horizontal situation display utilizing all the same control functions. See the instructions for the horizontal situation display in this reference section to understand radar operational functions.

Toggle activation of the on-screen radar by pressing [ALT-R].

HUD OPERATION MODE INDICATOR

The HUD operates in multiple modes which are automatically activated when the appropriate system is engaged. The operation mode indicator can be found at the lower left corner of the HUD.

NAV mode is the default HUD mode. If no weapons are armed, Navigation Mode is active.

LCOS mode is activated automatically when guns have been armed. The HUD targeting systems operate in Air-to-Air Targeting mode for guns. LCOS stands for Lead Computing Optional Sight.

ATA mode is activated when Air-to-Air missiles have been armed. The HUD targeting systems operate in Air-to-Air Targeting mode for AMRAAM and Sidewinder missiles.

ATG mode is activated when Air-to-Ground missiles are armed. The HUD targeting systems operate in Air-to-Ground Targeting mode for Maverick missiles.

CCIP mode is activated when bombs have been armed. The HUD targeting systems operate in Continuously-Calculated-Impact-Point mode for Mk82 and Mk84bombs.

HEADS UP DISPLAY

WEAPONS STATUS INDICATOR

The Weapons Status Indicator can be found displayed at the lower left corner of the HUD, just above the HUD Operation Mode Indicator. The weapons status indicator shows which weapon type is currently armed and quantity of that weapon available.

The display uses abbreviations to indicate the different weapons:

AM = AMRAAM Missiles

S/W = Sidewinder Missiles

PH = Aim-54 Phoenix

MK84 = 2,000 lbs. Bombs

MK82 = 500 lbs. Bombs

MAV = Maverick Missiles

GUN = M61A1 Vulcan 20mm cannon

GBU24 = GBU-24 Laser Guided Bombs

G LOAD INDICATOR

The standard measure of gravity is determined by its effect on objects at sea level on Earth. At sea level the force of gravity is said to be 1 G (pronounced "gee"). Forces produced by acceleration behave similar to gravity and are also measured in Gs. If a plane performs a rapid banking turn centrifugal force acts upon the plane and pilot creating what feels like gravitational pull from outside the turn. That G force can cause a great deal of problems. If the G force is strong toward the bottom of the plane the pilots blood will be pulled away from his head causing him to lose consciousness. If the G force is too strong it will wrench the plane apart. Because of the potential danger G forces present, the pilot must remain aware of the load he is subjecting himself and his aircraft to. The G Load Indicator takes the guess work out of this awareness.

THRUST INDICATOR

The thrust indicator display is found in the top left corner of the HUD. This number is a percentage of full Military Thrust. This will also display the 5 stages of afterburner, AB 1-5.

HEADING INDICATOR

The heading indicator is found running horizontally across the top of the HUD. Your "heading" is simply the compass direction you are headed. Instead of saying north, east, south, and west the heading is measured in the three hundred and sixty degrees of a circle. Zero degrees is due north, ninety degrees is due east, one hundred eighty degrees is due south, and two hundred seventy degrees is due west.

The heading indicator or "tape" found running horizontally across the top of the HUD displays tens of degrees. In other words, looking at the heading tape and seeing the number 18 means you are flying at a 180 degree heading or due south. If the tape reads 03 you are flying at a 30 degree heading or "a little east of due north but not quite exactly north-east".

GEAR, HOOK, BRAKE INDICATORS

The landing gear, arrestor hook, and air-brake can not be seen from within the cockpit. The HUD displays which, if any, are activated by displaying the word GEAR if your landing gear is deployed, HOOK if your arrestor hook is deployed, and BRAKE if your air-brake is activated. If an individual indicator is not displayed on the HUD that device is not deployed or activated.

ALTITUDE INDICATOR

The altitude indicator or "tape" runs vertically along the right side of the HUD. Altitude is displayed in thousands of feet. So an altitude reading of 4.5 means 4500 feet.

Altitude can be measured as height Above Ground Level (AGL) which is good if you want to remain above the ground but not so good if you want to maintain level flight. Imagine trying to remain exactly ten thousand feet above hilly or mountainous terrain. It could be like riding a roller-coaster as you fly up over mountains then down over valleys attempting to maintain a constant altitude.

Another way altitude is measured is as height above sea level or Mean-Sea-Level (MSL). This method is great for maintaining level flight but it offers no indication of how close to the ground you may be. It would not be unusual to be 2000 feet above sea level with your feet planted firmly on the ground.

Each method of measuring altitude has advantages in different situations. Depending on which type of measurement is needed the Altitude Indicator can display altitude in either mode. If the Altitude Indicator is currently displaying altitude in MSL mode a letter "S" will appear next to the tape. If altitude is currently displayed in AGL mode a letter "G" will appear next to the tape.

TARGET STATUS INDICATOR

If you have an air-to-air weapon armed and a target selected the target status indicator will appear on the HUD to provide information on the type of target, the distance to the target and your closure rate with the target. Information on how this information is acquired can be found in the section on Radar elsewhere in this reference section.

IFF DISCRIMINATOR - [;]

A radar screen can become cluttered quickly in large battles. The pilot finding himself in this situation may accidentally target a friendly aircraft. To prevent accidents such as this the targeting system can be set to only allow targeting of certain "classes" of targets. In this case the pilot would only want his targeting system to pick out hostile targets and never anything else.

The current targeting mode is indicated at the bottom, center of the HUD by one of three letters. Either "A" for all signatures, "H" for hostile targets only, or "NH" for non-hostile targets only. Change the Targeting Mode Indicator by pressing [;].

COMBAT CONTROLS

VELOCITY VECTOR

The velocity vector symbol in the HUD points in the aircraft's actual direction as opposed to the direction the nose is pointed.

ILS/CLS

The Instrument/Carrier Landing System displays information on the HUD, guiding the pilot to the landing strip. The ILS/CLS consists of a vertical line and a horizontal line located in the center of the HUD, and a small mark on the heading tape.

The vertical bar is the Runway Lineup Indicator and the horizontal bar is the Glide Slope Indicator. The small "^" mark on the heading indicator is the Navigation Direction indicator. Refer to the Pilot Notes section of this manual for more information on the ILS/CLS.

WAYPOINT DESIGNATOR

A waypoint is a predetermined location at which a pilot has to perform some function such as changing heading. A series of waypoints can guide a pilot across vast terrain leading him to his target while avoiding dangers on the ground or avoiding detection by radar.

Waypoints are preprogrammed into the aircraft's navigation system and displayed in the HUD as a hollow inverted triangle. The inverted triangle will appear to float over the waypoint location no matter the distance of the waypoint to the pilot. All the pilot need do is turn the plane until the indicator is centered in the HUD and fly on that heading until he reaches the waypoint.

RANGE MARKER

The range marker will appear near the 11 o'clock position of the aiming reticule when the selected target is approximately 11000 feet away. As the distance to the target decreases, the Range Marker will rotate counter-clockwise around the edge of the Aiming Reticule. Each "o'clock" position represents 1000 feet.

ASPECT ANGLE INDICATOR

The Aspect Angle indicates the target's current heading relative to your current position. When the indicator is at or near the bottom of the pipper, it means the target aircraft is heading away from you increasing the probability of a hit.

COMBAT CONTROLS

Combat is the best part of flight simulation. This section will teach you the basics about your aircraft's combat systems, including using the radar, weapons, and countermeasures.

The main radar is located in the Horizontal Situation Display (or "HSD") and is also displayed as the On Screen Radar for convenience. It is a highly sensitive integrated radar system that enables you find and track targets in a 360° view. It combines the advantages of a traditional radar with radar-warning receivers, global positioning systems and AWACS links. Always active, the radar can be viewed by pressing [F6].

The radar screen is dominated by a large circle with a small "aircraft icon" in its center. The white "T" represents your plane and the circle depicts the radar's current range. If, for example, the range is set at "10," then the circle represents a ten mile radius around the plane. Any target located within this radius will appear on the radar. The radar's default range is "40." To change the range, press [R] and [Shift-R]. This allows you to choose from ranges of 160, 80, 40, 20, 10, 5, 2 or 1 mile.

Note: You probably should use a range of either "2" or "1" during a dogfight.

If a target is within the range you have selected, it will appear as a dot or "blip." The blip's position in the radar corresponds to its position in space. For example, a blip at the top of the radar means that the target is directly ahead of the plane (or "twelve o-clock"). Likewise, a blip on the left side of the radar means that the target is directly to the left of the plane (or "nine o'clock").

The color and size of the dots also provide information about the target. Each color designates different kinds of objects. The colors stand for:

Red = enemy

Green = friendly

Gray = unidentified

White = missile

Brown = navy craft (such as a carrier)

The size variations also tell you where a target is located relative to your position. For instance, a large dot indicates that the target has a higher altitude, whereas a smaller dot means that the target is below you.

To choose a target for combat, cycle through the dots by pressing [T] and [Shift-T]. The currently selected target will appear encircled and its status will be displayed in the lower left-hand corner. Once chosen, the radar will track this target in the HUD with the large green target designator box.

The tracking computer will then identify the target and show its posture (friendly is green and enemy is red). The target's current altitude (in feet), speed (in knots), and heading (in degrees) are also reported.

WEAPONS SYSTEM

Having an ample supply of armed weapons is the first step to successful combat. However, you also need to know how to aim and fire your weapons. This section comprehensively explains the weapons system in *JetFighter IV*.

COMBAT CONTROLS

WEAPON SELECTION ATA: [Enter] & ATG [Backspace]

Modern fighters can be armed with several different kinds of weapons for a variety of purposes. For example, a fully loaded F-22 Raptor may carry Sidewinders, AMRAAMS, Mavericks, and others. However, you must first select a weapon before you can fire it.

As the default mode, no weapons are armed. To arm an Air-to-Air weapon, press [Enter]. The first time you press [Enter] you will arm your cannon or ("GUN").

To arm an Air-to-Ground weapon, press [Backspace]. The name of the armed weapon will then be displayed in the lower left-hand corner of the HUD:

AM = AMRAAM Missiles

S/W = Sidewinder Missiles

PH = Aim-54 Phoenix

MK84 = 2,000 lbs. Bombs

MK82 = 500 lbs. Bombs

MAV = Maverick Missiles

GUN = M61A1 Vulcan 20mm cannon

GBU24 = GBU-24 Laser Guided Bombs

The amount of munitions available appears next to the name of the weapon in the HUD. For example, if it displays "S/W 2" then two Sidewinder missiles ready and armed. Each time you fire a weapon, one unit is deducted from its stores. Likewise, if your aircraft was not loaded with a particular kind of weapon, it will not appear as a choice.

WEAPON TARGETING - [T]

You must select a target for your weapons. To select a target, press [T]. This brings up one of the targets appearing in the radar. To switch to the next target, press [T] again or press [Shift-T] to return to a previous target. Notice that the available targets depend upon the type of weapon you have selected. For example, if you have chosen an air-to-ground weapon (like the AGM-65 Maverick), then you will not be able to target an incoming enemy aircraft.

TARGET CLOSEST - [Y]

After selecting a weapon, pressing [Y] will target the enemy that is closest to you.

TARGET IN CENTER OF HUD - [U]

Pressing [U] will target the object that lies within your aiming reticule. This target will be appropriate to the weapon selected, either ATA or ATG.

WEAPON FIRING - [Spacebar]

After you have selected a weapon and a target, you are ready to fire. To fire the weapon, press the [Spacebar]. Each time you press the [Spacebar], one unit is removed from the available stores. After the stores are depleted, you cannot fire that weapon until the plane is rearmed at a base. To continue firing, you need to select a different weapon with available stores.

The probability of success depends upon many factors. Angle, distance, orientation, velocity, maneuverability, and a host of other conditions all play a role. In addition, every kind of weapons has its own unique strengths and weaknesses. For example, the M61A1 Vulcan 20mm cannon must be fired in front of the target (i.e., "leading the target") to compensate for its motion. Only experience can teach you what weapon to fire and when.

Note: With most joysticks, the trigger will always fire the cannon. One of the buttons on the top of the joystick will toggle through the available armaments while another button will launch that selected weapon.

LANTIRN - [L]

The LANTIRN targeting system uses a powerful camera and a computer controlled system that allows you to zoom-in on the ground and identify targets. Typically the LANTIRN system is used when you know the general location of a target, but not its precise coordinates. For example, you may be ordered to destroy a tank park near Waypoint 4. Using the LANTIRN system, you can search for the targets near Waypoint 4 from a far distance away.

When you are about 15-20 miles from the target, you can use the LANTIRN system to start scanning the area. Press [L] to switch to LANTIRN view. Once in the LANTIRN view, aircraft controls are locked out and joystick and view keys are used to move the camera instead of the aircraft. As such, you may want to engage the Autopilot to keep you on course. Additionally, the LANTIRN camera is fully "horizon-stabilized" meaning that the horizon, if visible, is always left-to-right across the screen, regardless of the aircraft's position if it banks and turns.

Press [N] to cycle through waypoints until you have selected the target waypoint. Press [>] to zoom in, if need be. Notice that the increments of Zoom are different that those in the cockpit or outside views. Use the joystick or view keys to pan the LANTIRN camera around the terrain until you find your target. Once you have found your target, place the crosshairs over the target and press [T] to select it. The LANTIRN system is now "locked on" to the target and a rectangular box appears around it. If you are targeting an object, you will see the word POINT. If you are targeting a point on the ground, you will see the word AREA.

Press [L] again to return to normal view. Regardless of where you fly, the LANTIRN system will remain "locked" on the designated target point, that is, until you use the joystick or view keys to move the camera's position when you return to the LANTIRN view.

VIEWS

While in route to your target, arm your weapon by pressing [Backspace]. Note that only Mavericks and GBU-24s can guide themselves toward the target selected with the LANTIRN system. You may want to occasionally return to LANTIRN view to check your target, as some targets may be difficult to recognize from a far distance and you will want to confirm your selection. Also, while the LANTIRN system can track moving targets, you need to be aware that your target may have moved behind a hill or other obstacle. Keep in mind, if the LANTIRN camera can't see the target, you can't attack it. Therefore you must be sure your aircraft is in a position for the LANTIRN camera to "see" the target. As you approach the target, make a final LANTIRN check to verify you have a "good" target. For Mavericks, you can fire ([Spacebar] or [joystick button]) when the IN RNG symbol appears. For GBU-24s, press the release button ([Spacebar] or [joystick button]) when the release marks line up. Be sure the LANTIRN camera can keep the target in view, or your weapons may not track the laser properly. After release, you should perform an "egress turn" and get out of the area. The enemy will soon be very aware of your presence! To get a good look at the action switch back to the LANTIRN view. The LANTIRN camera is great for getting a close-up view of the action when your bombs hit!

COUNTERMEASURES

A countermeasure is any tactical defense employed by an aircraft to avoid being hit by an enemy's weapons. In general, there are two kinds of countermeasures: deployable and electronic. Both are discussed below.

DEPLOYABLE COUNTERMEASURES

Deployable countermeasures include any object jettisoned by the aircraft to confuse or distract incoming missiles. The two most common deployable countermeasures are flares and chaff.

FLARES - [F]

Flares are launched from your aircraft and burn very, very hot. This intense heat is designed to confuse heat-seeking weapons into thinking the flare is the target, and not your engines! The number of flares remaining in stores can be viewed in the Systems Display. (For more information, see Systems Display in this reference section).

CHAFF - [C]

When launched, chaff packs burst open into clouds of metallic foil and wire . This cloud is designed to confuse radar-seeking weapons (like the AMRAAM) into thinking that it is the target. The number of chaff packs remaining in stores can be viewed in the Systems Display. (For more information, see Systems Display in this reference section).

ELECTRONIC COUNTERMEASURES - [J]

Electronic countermeasures (or "ECM") are electronic signals sent out to confuse or "jam" incoming missiles. ECM jamming devices emit such a strong radar signal that they can sometimes hide an aircraft's actual position from radar-seeking weapons like the AMRAAM. This kind of noise jamming is most effective against discrete targets that are still far away. You can turn the ECM device on and off by pressing [J]. When activated, the red "ECM" light will appear on the Systems Display. Be careful to use the Jammer only when needed. Jamming a target that has not yet detected you may actually alert it to your presence!

INTERNAL VIEWS

In *JetFighter IV* you will spend most of your time in the cockpit. A wide variety of views are available from within the cockpit. Some views help you scan the skies for bogies, and others help you check cockpit instrumentation.

PRE-SET VIEWS

The following pre-set views quickly pan your view to the requested angle.

LOOK AHEAD (Normal View)- [F1]

This is the default view, looking forward through the canopy. It is the primary view for travel and combat. "Look Ahead" is activated by pressing [F1].

If you are already looking ahead when you press [F1] the instrument panel will be toggled off to provide a "full-screen" view. Think of this as a "panic button" which will always return you to the "Look Ahead View".

LOOK LEFT - [F2]

This preset view quickly looks out the left window of the fighter. This view is useful when you need to locate an object or landmark to the left of the plane. "Look Left" can be activated by pressing [F2]. To return to the "Look Ahead" default view, press [F1].

LOOK RIGHT - [F3]

This preset view looks out the right window of your aircraft. This view is useful when you need to locate an object or landmark to the right of the plane. "Look Right" can be activated by pressing [F3]. To return to the "Look Ahead" default view, press [F1].

LOOK BACK (CHECK SIX) - [F4]

This preset view looks out the back of the airplane. This view is useful when you need to determine if an enemy is on your six (behind you). "Look Back" can be activated by pressing [F4]. To return to the "Look Ahead" default view, press [F1].

MULTI-FUNCTION DISPLAY (MFD) VIEWS

The MFD views enable you to look down at the cockpit instrumentation. Each of the 4 different MFDs is assigned a function key [F5] - [F8].

LEFT MFD / DEFENSIVE DISPLAY - [F5]

Press [F5] to view the Defensive Display. Press [F5] again to cycle through the modes of this MFD. Press [F1] to return to "Look Ahead" view.

VIRTUAL COCKPIT

CENTER MFD / HORIZONTAL SITUATION DISPLAY - [F6]

Press [F6] to view the Horizontal Situation Display. This MFD has only one mode. Press [F1] to return to "Look Ahead" view.

RIGHT MFD / OFFENSIVE DISPLAY - [F7]

Press [F7] to view the Offensive Display. Press [F7] again to cycle through the modes of this MFD. Press [F1] to return to "Look Ahead" view.

LOWER MFD / SYSTEMS DISPLAY - [F8]

Press [F8] to view the Systems Display. This MFD has only one mode. Press [F1] to return to "Look Ahead" view.

MAP VIEW - [M]

Map view is invaluable during a mission because it enables you to quickly get your bearings, find a target, or increase situational awareness. To toggle map view on or off, press [M]. In the map view your plane is designated by the white aircraft icon located in the center of the map. Other icons may be present as well but your plane is always the one represented at the center. The zoom keys [<] and [>] can be used in map view to enlarge or reduce map area coverage. Pressing [M] again will return you from map view.

TACTICAL VIEW - [F9]

Manipulating views and piloting the aircraft can be difficult to perform simultaneously, especially while you are under attack. Tactical (TAC) view by automatically following a target whether it is on the ground or in the air. Having your view locked onto the target allows you to pilot the plane unimpeded. Toggle TAC view on and off by pressing [F9].

Note: You may want to be sure the instrument panel is visible ([P]) while using TAC view. Rapid maneuvering can make tactical view disorienting if the panel is off.

VIRTUAL COCKPIT VIEWING

If you are a long-time flight sim fan you will find *JetFighter IV*'s Virtual Cockpit a welcome change over the old static views available in most flight simulators. The virtual cockpit does not limit your views to front, right, left, and back. It allows you to smoothly view your entire surroundings as though you were moving your head within the simulator.

LOOKING AROUND

To pan your view up press [Numpad 3]. To pan your view down press [Numpad Del]. Pan left is [Numpad 7] and pan right is [Numpad 9]. You may use any combination of these keys to focus your view on anything in your surroundings. To re-center your view to the default "Look Ahead" view press [Numpad 5] or [F1].

Using the virtual cockpit is even easier if you have a joystick. Panning your virtual view with a joystick is accomplished by holding down joystick button #2 while moving the joystick. As long as the button is held the joystick will only affect your view, not the actual plane maneuver. Once you have released the button your view will be locked in the direction you left it.

To re-center to the "Look Ahead" view quickly click joystick button #2 once or press [F1] on the keyboard.

ZOOMING

While in any view you can "zoom in" on what you are looking at by pressing the [>] key. To "Zoom out" use the [<] key. To return to the default "Look Ahead" non-zoomed view press [Numpad 5] or [F1].

HEAD MOVEMENT - [CTRL][H]

When you turn a corner while walking or driving a car you naturally swivel your head in the direction of the turn. This occurs while flying as well but most simulators keep your view unnaturally locked straight ahead. *JetFighter IV* provides an optional feature called "head slide" which will automatically turn your view slightly into every banking turn you make. Toggle this feature by typing [Ctrl-H].

INSTRUMENT PANEL ON/OFF - [P]

Pressing [P] toggles the instrument panel off providing an unobstructed view of your surroundings. The HUD information will remain visible so you will still have enough information to fly the plane. With the panel off, any views previously obstructed by part of the aircraft will now be clear. A good example would be the "Look Back" view which is normally obscured by the seat. [F1] can also be used to toggle the instrument panel, but it also returns to the forward looking "normal" view.

At times you may wish to view one of the MFDs using a preset view key [F5] - [F8] when the instrument panel is off. Pressing one of these keys will toggle the instrument panel on and center your view on the selected MFD. Pressing [F1] will then return you to the "Look Ahead" view and toggle the instrument panel off again.

EXTERNAL VIEWS

EXTERNAL VIEWS

JetFighter IV provides a multitude of external views enabling you to view the outside of your aircraft from any angle. External viewing is as flexible as internal viewing and you still have control of the aircraft. You will be able to watch exciting events like takeoffs and landings, missile firings, bombing runs and more, all from outside the plane.

ACTIVATING EXTERNAL VIEW - [NUMPAD -]

To activate external viewing press [NUMPAD -]. To deactivate external viewing press either

[NUMPAD -] or [F1].

PANNING

To pan your view around the plane you must have already activated external viewing by pressing [NUMPAD -]. Once outside the plane you can smoothly control your view using the same controls as the internal cockpit view.

To rotate your view under the plane press [NUMPAD Del]. Rotate your view above the plane by pressing [NUMPAD 3].

Use [NUMPAD 7] to rotate your view clockwise or [NUMPAD 9] to rotate your view counter-clockwise.

Panning your external view with a joystick is done by holding down joystick button #2 while moving the joystick. As long as the button is held the joystick will only affect your view, not the plane itself. Once you have released the button your view will be locked where you left it.

Press [F1] or [NUMPAD -] to return to the interior view.

ZOOMING - [<] AND [>]

While viewing from any orientation you can "zoom in" on what you are looking at by pressing the [>] key. You can "zoom out" with the [<] key. Press [NUMPAD 5] to reset to the default external view.

Some advanced joysticks may have a button assigned to zoom.

PRESET EXTERNAL VIEWS

Nine preset external views are provided. Each preset view can be activated by

holding down the [Shift] key and using the Numpad. In fact, the key's position on the Numpad corresponds to its external view. These preset external views include:

[Shift][Numpad-1] - behind and left of the plane

[**Shift][Numpad-2]** - directly behind the plane

[Shift][Numpad-3] - behind and right of the plane

[Shift][Numpad-4] - left of the plane

[Shift][Numpad-5] - above the plane

[Shift][Numpad-6] - right of the plane

[Shift][Numpad-7] - ahead of and left of the plane, looking back

[Shift][Numpad-8] - directly ahead of the plane, looking back

[Shift][Numpad-9] - ahead of and right of the plane, looking back

PROGRAMMABLE VIEWS

Perhaps there is a particular view angle you are fond of and would like a quick key combination to activate it. The external views can be customized to your liking. To do so, first use virtual viewing to select the angle you would like to save. Next, press [Ctrl] and the preset viewing key combo you want to change. For example, if you wish to program your current view to be activated by [Shift-Numpad 3] press [Ctrl-Shift-Numpad 3] and from that point on [Shift-Numpad 3] will always jump to that view.

FLY-BY VIEW - [F11]

JetFighter IV offers a dramatic fly-by view of your plane. This view locks the camera ahead of the plane as you fly toward it. As you speed by, the camera tracks your aircraft, keeping it in view. You can press [F11] again to re-set the view. While in fly-by view you are still in full control of your aircraft. As always, you can press [F1] to return to the cockpit.

AUTO FLY-BY VIEW: [CTRL-F11]

This is just like fly-by view, except as your aircraft flies out of sight, the view will automatically reset to another flyby.

WEAPON VIEW - [F10]

Weapon view is an exciting feature enabling you to follow a missile or bomb to its target. While in weapon view you can use all the panning and zooming controls available in the external aircraft view but now you will be viewing the weapon instead of your plane. To return to the cockpit press [F10] again or [F1]. If you continue viewing the weapon until it detonates your view will automatically be returned to the last view you were in before pressing [F10].

IN FLIGHT MENU-GAME MENU

CARRIER VIEWS - [Numpad *]

Use the [Numpad *] key to cycle through ten pre-set camera positions around the aircraft carrier. They are:

Control tower

Catapult officer - forward

Catapult officer - aft

Shooter - forward

Shooter - aft

LSO platform

10 o'clock view

12 o'clock view

5 o'clock view

3 o'clock view

TOWER VIEW - [NUMPAD *]

Tower view will place your view at an airport control tower or aircraft carrier superstructure depending on where you started your mission. To activate tower view press [Numpad *]. Try buzzing the tower and switching to tower view as you pass by! Pressing [Numpad *] again will toggle off tower view and return you to the view that was current before activating tower view.

TACTICAL VIEW - [F9]

In external mode this view keeps you and your target in the frame at all times.

WINGMAN VIEW - [W]

Press [W] to look at your wingman (if you have one!). The zoom keys, [<] and [>], work in this mode as well. You can also use wingman view while in external view. Press [Numpad -] for external view and then [W] to keep you and your wingman in view at all times.

IN FLIGHT MENU

The In-Flight Menu provides a great deal of control over the simulator without the need to exit to the Main Menu to make adjustments. Activate the in-flight menu in the simulator by pressing the [ESC] key. On the menu you will see eight menu headings: GAME, CONTROLS, VIEW, DISPLAY, AVIONICS, SOUND, CHEATS, INFO/HELP. Following are descriptions of each menu and its individual functions.

GAME

The game menu contains functions to change free flight parameters within the simulator, abort missions, restart missions, exit the simulator or exit *JetFighter IV* completely.

FREE FLIGHT SETUP

You may begin a FREE FLIGHT session at any time, even right in the middle of a mission. While not as feature rich as the FREE FLIGHT setup, if you wish to begin a FREE FLIGHT session without exiting the simulator you may work with the parameters provided through this menu.

ABORT MISSION - CONTINUE AS PRACTICE

This feature enables you to fly a FREE FLIGHT session with all of the parameters set by a mission. In other words, if you enjoy the environment in a particular mission this feature permits engaging a FREE FLIGHT session that is set up exactly the same as the mission. Enter the simulator through the desired mission then switch to FREE FLIGHT with this menu option.

END MISSION - RETURN TO BASE/RETURN TO CARRIER

If for any reason you wish to abort the mission you are currently engaged in, return to the carrier via this menu option.

AUTO LAND

When flying missions you can avoid the need to return to the carrier and land by selecting AUTO LAND. The mission objectives must be completed and the MISSION COMPLETE dialog box must appear BEFORE you can select AUTO LAND.

REVIEW MISSION ORDERS

If any details of your mission orders have slipped your mind, you can review the orders for your current mission here.

RESTART CURRENT MISSION

Off to a bad start? Restart the current mission with no penalty to your campaign statistics.

RESUME FLIGHT

Most of the In-Flight menus display this RESUME FLIGHT option. Selecting RESUME FLIGHT or pressing [R] will return you to the simulator.

EXIT JETFIGHTER IV

Selecting EXIT *JetFighter IV* will completely exit *JetFighter IV*. Your mission will not be saved and it will not be counted toward or against your campaign score.

CONTROLS - DISPLAY MENU

CONTROLS

The CONTROLS menu enables you to toggle on or off the use of hardware devices supported by *JetFighter IV*. Supported hardware includes Joysticks, Throttle Control, and Rudder Pedals.

To fine tune the joystick sensitivity and joystick "dead zone", press [ESC] then [J].

VIEW

While not as simple as using "hotkeys" directly within the simulator, the VIEW menu provides another way to activate various available views. It also functions as a quick reference because each view menu item lists the keystroke needed to activate the view within the simulator. A thorough explanation of all available viewing option controls can be found in the section on VIEW CONTROLS elsewhere within this reference section.

DISPLAY

Flight Sim fans come from all walks of life, and this means a variety of computer equipment ranging from barely compatible to state-of-the-art will put *JetFighter IV* to the test. Many of the simulator environment controls are available on the DISPLAY menu. These are offered as a way to customize the look and feel of *JetFighter IV* to suit your needs. Adjusting some options will decrease the graphic detail, but give you a faster frame rate. If you currently are running *JetFighter IV* on a computer that just barely meets the minimum requirements, you may wish to turn off or change some display options. Reducing screen resolution will have the greatest effect on speeding up the frame rate.

Experiment with different configurations until you are comfortable with the trade-offs. See also GRAPHICS under OPTIONS of the Main Menu section to change many of these Display options.

CLOUDS - [ALT-C]

Press [Alt-C] to cycle through several levels of cloud cover.

VISIBILITY - [ALT-V]

This feature enables you to change the level of atmospheric haze within the simulator. If you wish to fly with maximum visibility, set this option to CLEAR. For reduced visibility set it to HAZY. And for low visibility set it to FOGGY. Lower visibility settings may improve frame rate.

REDOUT

JetFighter IV emulates redouts for enhanced realism. Real fighter pilots must avoid the danger of artificially creating a great deal of centrifugal force on themselves by turning too sharply at high speeds. The danger in creating centrifugal force in this fashion is it will force the blood in the pilot's circulatory system to pool up at one end of his body or the other. If the blood rushes toward his head and away from his feet he may lose consciousness or "red out".

BLACKOUT

JetFighter IV also emulates blackouts for enhanced realism. If the blood rushes toward his feet and away from his head he may lose consciousness or "black out".

SUN WASH

When you look directly into the sun the overwhelming amount of light affects your ability to see your surroundings. The optional SUN WASH visual effect is provided for enhanced realism.

AVIONICS

The Avionics menu provides functions to control the operation of various cockpit instruments.

HUD BRIGHTNESS - [H]

The brightness of the HUD is controllable for different environments. During the day the display may be difficult to see against the terrain unless it is set to one of its brightest settings. Conversely, dim the HUD while flying at night to keep your eyes sensitive to the dark terrain. [H] toggles the HUD between the 0%, 20%, 40%, 60%, 80%, 100% and AUTO. AUTO will automatically adjust the brightness of the HUD based upon the time of day.

ATTITUDE INDICATOR (Pitch Ladder) - [ALT-L]

Toggle through the pitch ladder modes with this menu option. NORMAL provides three degree levels of pitch, FINE provides six degree levels of pitch, and OFF disables the pitch ladder.

INSTRUMENT PANEL - [P]

The entire cockpit can be toggled off providing an unobstructed view of your surroundings. The HUD information will remain visible but the control panel and all other cockpit items will disappear.

AUTO RANGING - [CTRL-R]

Turning Auto Ranging on will cause the radar to automatically select a range that keeps the currently selected bandit in your radar.

ON-SCREEN RADAR - [ALT-R]

The radar is the most commonly used instrument not displayed in the HUD. To check the radar you would have to take your eyes off the action and risk disorientation or losing sight of a target. *JetFighter IV* provides an On-Screen radar to compensate.

AVIONICS MENU

TARGETING MODE - [;]

The Targeting Mode feature provides a way to selectively target identifiable radar returns by type. To target any object shown on radar set this option to ALL SIGNATURES (A). To target only friendlies select NON-HOSTILES (NH) or to target enemies only select HOSTILES ONLY (H).

Setting the targeting mode to HOSTILES ONLY will go a long way toward keeping the inexperienced pilot from splashing friendly aircraft.

ALTIMETER - [ALT-A]

The Altimeter operates in either of two modes. It will show your altitude above Mean Sea Level (MSL) or your altitude Above Ground Level (AGL). AGL mode is very helpful in terrain avoidance while MSL mode provides a more accurate altitude reading relative to sea level.

SOUND

The Sound menu provides ON/OFF control and volume control for the simulator's music, sound effects, and voices.

SOUNDS MODE

The SOUNDS MODE control toggles ALL available sounds on and off. With this option set to OFF none of the sound effects, voices or music will be heard.

SOUND EFFECTS VOLUME

Toggle the volume of sound effects such as explosions, fire, bomb hits, etc. between OFF, LOW, MED, HIGH, or FULL.

MUSIC VOLUME

Toggle the music volume between OFF, LOW, MED, HIGH, or FULL.

RADIO CHATTER VOLUME

Adjust the radio chatter volume to the desired level: OFF, LOW, MED, HIGH, or FULL.

WARNINGS VOLUME

All of the warning beeps, boops, horns and sirens can be adjusted between OFF, LOW, MED, HIGH, or FULL.

ENGINE VOLUME

Set the engine volume to a level you are comfortable with. Options include OFF, LOW, MED, HIGH, or FULL.

CHEATS

For those of you who may not be familiar with the term "cheats", a "cheat" is a way of defying the "normal" rules in a program. Cheats are handy for the person whose skills in certain areas are not yet developed but they would still like to use the simulator without getting wiped out. First time users benefit most from this cheat but even the daredevil pilot practicing low altitude maneuvers has been known to use it.

For more detailed information on Cheats, refer to CHEATS under the OPTIONS section of the Main Menu. Listed below are the cheat options in the In Flight Menu and their corresponding key commands (if available).

RE-ARM with [SHIFT-M]

With the RE-ARM cheat set to YES you will be able to re-arm depleted stores of weapons with the [SHIFT-M] key combination in the simulator. There is no limit to the number of times [SHIFT-M] can be used.

RE-FUEL with [SHIFT-F]

If you fly around for long periods of time you may find yourself running out of fuel. Ordinarily you would land at an airport or the carrier to be re-fueled and re-armed but with this feature set to YES you will be able to re-fuel at any time by pressing [SHIFT-F].

INVULNERABILITY

With the INVULNERABLE cheat toggled ON, your plane can not be damaged by enemy air or ground weapons.

NO GROUND CRASHES

Enabling this cheat allows you to harmlessly dive into the earth without a scratch. Instead of exploding on contact, your plane "bounces" off of the ground.

NO MID-AIR COLLISIONS

Though it is rare, it is possible to collide with another plane. Enabling this cheat allows you to harmlessly pass through other planes.

LANDING EASE

Mastering landings may take a while or remain difficult for some people. Select the difficulty that best suits your skill level.

GUN AIMING EASE

Shooting down an enemy plane with guns requires some fancy flying and good aim. If set to REALISTIC aiming the gun can be quite difficult. Select the difficulty that best suits your skill level.

CHEATS MENU

TIME COMPRESSION

Some missions may require you to fly several hundred miles. If you want to speed up the cross-country flight and get right to the action use *JetFighter IV*'s Time Compression feature. For more information on TIME COMPRESSION mode see OTHER CONTROLS elsewhere in this reference section.

INFO/HELP

If you can't remember the keystroke for a particular feature or want to check your current statistics this is the place to go.

KEYBOARD HELP

Remembering the multitude of keystrokes required to perform every function may take a little time. If you need to quickly refresh your memory, select KEYBOARD HELP for a complete list of available functions.

CURRENT STATISTICS

See this menu if you wish to check your current statistics prior to the end of the mission.

JetFighter IV is configurable to your preferences. In addition, the program provides some keyboard short-cuts which may be useful. These utility functions include: volume level, pause, and exit.

MISCELLANEOUS CONTROLS

ENGINE VOLUME LEVEL - [E]

The engine volume is adjustable between five preset levels. Press [E] to toggle through the levels.

PAUSE - [CTRL] [P]

Press [P] to pause the simulator at any time. When the simulator has been paused the word "PAUSED" will appear at the upper left of your screen. To end the pause toggle [P] again.

EXIT TO WINDOWS - [CTRL-C] OR [ALT-X]

If you would like to exit JetFighter completely press either [Ctrl-C] or [Alt-X]. A dialog box will appear, asking if you want to quit the game and return to Windows.

GLOSSARY

This glossary contains a list of terms and abbreviations that you may come across in general aviation. Many of these words are also used in this manual.

A/A
See Air-to-Air.

AAA
Anti-Aircraft Artillery.

AAM
Air-to-Air Missile.

AAW
Anti-Air Warfare.

AB
See Afterburner.

A-C
Pilot jargon referring to the border between Argentina and Chile.

ACL
Automatic Carrier Landing.

ACLS
Automatic Carrier Landing System.

ACM
Air Combat Maneuvering. Generally refers to flight maneuvering.

ACT
Air Combat Tactics. Generally refers to flight tactics.

ACQ
Acquisition.

ADI
Attitude Director Indicator.

AEW
Airborne Early Warning Aircraft.

AFCS
Automatic Flight Control System.

AFT
The rear of a ship. Also known as Stern.

AFTERBURNER
The section of a gas turbine engine used in military aircraft that produces additional thrust by spraying raw fuel into the exhaust and igniting it.

A/G
See Air-to-Ground.

AGL
Above Ground Level.

AHRS
Attitude Heading Reference System.

AIC
Airborne Intercept Control.

AILERONS
The hinged trailing edges of a wing which can be manipulated to change the plane's lift and altitude.

AILERON ROLL
A maneuver whereby the aircraft rolls about its axis of flight induced solely by the use of ailerons.

AIMING RETICULE
An optical image used to aim a weapon when using the HUD. It is also known as Pipper.

AIR BOSS
Officer in control of the hangar and flight decks on a carrier.

AIR BRAKE
See Speedbrake.

AIRFOIL
Another word for a wing.

AIRSPEED
The velocity of an aircraft as compared to the surrounding air.

AIRSPEED INDICATOR
An onboard instrument used to determine the current Airspeed.

AIR-TO-AIR
Generally refers to a form of combat or a type of weapon. Most frequently used to describe a missile launched from an airplane with the intention of destroying another airplane or missile. Also known as A/A.

AIR-TO-GROUND
Generally refers to a form of combat or a type of weapon. Most frequently used to describe a missile or bomb launched from an airplane with the intention of destroying a target on the surface. Also known as A/G.

AIR-TO-GROUND TARGETING
The technique of locating a ground target and delivering weapons to it.

ALPHA
The designation used for a mission wing which will be escorting and protecting planes (like AWACS) from enemy fighters.

ALTIMETER
The onboard instrument which senses air pressure in order to gauge altitude.

ATITUDE INDICATOR
A device displaying the aircraft's orientation with respect to the horizon.

AM
See AMRAAM.

GLOSSARY (CONT.)

AMRAAM

An active-radar, medium range, air-to-air missile, this weapon has its own radar system and built-in inertial navigation system. The AMRAAM is the successor to the earlier Sparrow missile. Also known as AM.

ANGELS

Pilot jargon to denote the altitude of friendly aircraft in thousands of feet.

ANGLE OF APPROACH

The angle representing the ratio between ground speed and decreasing altitude. It is most often used in landing an aircraft. Also known as Glideslope.

ANGLE OF ATTACK

The angle of the wing surface to the airflow. If the angle of attack exceeds the wing's thrust, the plane will experience a loss of lift or Stall. Also known as AOA.

ANGLE OF CLIMB

The angle representing the ratio between ground speed and increasing altitude. In its simplest terms, it is the angle of the plane's nose above the horizon.

ANGLE OF DESCENT

Similar to Angle of Approach, but it is typically used in air-to-ground ordinance delivery.

AOA

See Angle Of Attack.

AON

Angle Off the Nose.

AOT

Angle Off the Aail.

APPROACH

The final flight path of an airplane that is landing.

ARG

Pilot jargon referring to Argentinean enemy units or positions.

ARRESTOR HOOK

A large steel bar with a protrusion to "catch" an arrestor cable used to stop an aircraft as it lands on an aircraft carrier. Also known as a Tail Hook.

ASPECT

The orientation of an aircraft as viewed from another. Important in targeting weapons.

ASR

Air Surveillance Radar.

ASW

Anti-Submarine Warfare.

ATDC

Airborne Tactical Data Control.

ATDS

Airborne tactical Data System.

AUTO

Generally refers to the activation of an automated system.

AUTOPILOT

A feature on many modern aircraft which will fly the plane without assistance from the pilot.

AVIONICS

A general terms for the airplane's electronic systems.

AWACS

Airborne Weapons And Control System.

BALLISTIC MISSILE

A surface-to-surface missile whose warheads are delivered by a short-lived boost into a low, semi-orbit.

BANDIT

An airplane identified as hostile.

BANK

When an aircraft rolls to one side.

BARCAP

See Barrier Combat Air Patrol.

BARRIER COMBAT AIR PATROL

Mission type instructing the pilot to engage any aircraft crossing into his patrol zone. This order is used to protect a corridor through which friendly bombers will pass on their way toward a target.

BARREL ROLL

A large rolling maneuver induced by aileron and rudder.

BER

Bearing. See Heading.

BETA

The designation used for a mission wing which will be bombing a ground target.

BFM

Basic Fighter Maneuvers

BINGO

Refers to a low fuel state. It is the amount of fuel necessary to complete a return trip back to base.

BLACKOUT

The loss of vision or consciousness which may occur when a pilot pulls too many positive Gs. It is caused by an insufficient blood supply to the head.

BLIP

A small dot which appears on a pilot's radar. Each blip represents an aircraft or launched weapon.

GLOSSARY (CONT.)

BOGEY
An unidentified airborne intruder.

BOLTER
When an aircraft misses all of the arresting cables during a carrier landing which resulted in an unintentional touch and go.

BOMBSIGHT
A physical or optical indicator for aiming free-fall weapons.

BOW
The front of a ship. Also known as Fore.

BREAK TURN
A maneuver accomplished by rolling the airplane 90 degrees and pulling back on the stick.

BUG OUT
Quickly leave the area of an engagement.

BVR
Beyond Visual Range.

C3
Command, Control and Communications.

CALLSIGN
The codename or nickname for a pilot.

CANOPY
The clear bubble-like covering which seals the top of the cockpit, protecting the pilot while providing an unobstructed view of the surrounding skies.

CAP
See Combat Air Patrol.

CARQUAL
The qualifications necessary for a pilot to attempt a landing on a aircraft carrier. Short for "carrier qualification."

CARRIER LANDING
Maneuvering an airplane so its arrestor hook engages one of four cables located within a 120 foot section of a carrier's flight deck.

CARRIER LANDING SYSTEM
The information display system used for carrier landings.

CAS
See Close Air Support.

CAT
See Catapult.

CATAPULT
Device for accelerating an aircraft to take-off speed in 2-seconds and 300 feet.

CATCC
Carrier Air Traffic Control Center.

CCA
Carrier Controlled Approach.

CCIP
Continuously Computed Impact Point.

CG
Center of Gravity.

CHAFF
Metallic foil packs ejected by an airplane in an effort to confuse an incoming radar-guided missile.

CHARLIE
A spoken signal from the Air Boss which means "clear to land."

CLEAR READ
Strong and identifiable signal on a radar scope.

CLOSE AIR SUPPORT
Mission order instructing a pilot to provide air cover for land units by engaging enemy fighters and ground positions.

CLOSING SPEED
The rate at which the target is approaching or pulling away from your aircraft.

CLS
Carrier Landing System.

CO
Commanding Officer.

COMBAT AIR PATROL
Mission type instructing the pilot to engage any aircraft crossing into his patrol zone. It is generally a constant patrol over a valuable asset such as an airfield.

COMMS
Communications.

CONTRAILS
The thin vapor trails left by an aircraft or missile.

CONTROL INPUTS
The controlling influences a pilot exerts on an aircraft's control surfaces.

CONTROL SURFACES
The moving, pilot-controllable parts of the airframe, including flaps, ailerons, rudders and elevators.

CONTROL TOWER
An airport structure housing air traffic controllers.

CRT
Cathode Ray Tube.

CSS
Control Stick Steering.

CV
Aircraft carrier.

CVN
Nuclear powered aircraft carrier.

CVA
Aircraft carrier approach.

CVS
Course Vectoring Symbols.

DECM
Defensive Electronic Countermeasures.

GLOSSARY (CONT.)

DELTA
The designation used for a mission wing that will be providing BarCap or TarCap air cover for bombers and other airplanes.

DEST
Destination.

DF
Direction Finder.

DFM
Dog Fight Mode.

DIVE BOMBING
Deliver bombs by placing the airplane on a collision course with the target, typically in a dive.

D/L
Data Link.

DMA
The Defense Mapping Agency collects terrain data and information.

DOGFIGHT
The aerial maneuvering by at least two planes in combat.

DRAG
Force created by an Airfoil moving through atmosphere, opposite to the direction of motion.

DROP
Release a bomb or to lose altitude suddenly.

DRONE
Unmanned airplane used as a target, research vehicle, or for reconnaissance.

DTG
Degrees To Go.

DUTY ROSTER
The list of available pilots for missions.

ECM
Electronic Countermeasures used to defeat enemy attacks.

ECM JAMMER
A device used to confuse or "jam" an enemy's radar and weapons.

EID
Electronic Identification.

ELEVATOR
Hinged portion of the horizontal stabilizer, which adds or subtracts lift from the tail, changing the pitch attitude of the aircraft.

ESCORT
Mission order instructing a pilot to fly with and protect another aircraft or unit.

ETA
Estimated Time of Arrival.

EVASIVE ACTION
Maneuvers intended to deny an opponent the opportunity to fire a weapon, or to avoid an incoming missile or bullet.

EWS
Early Warning System.

FCLP
Field Carrier Landing Practice

FIGHTER SWEEP
Mission order instructing a pilot to search out and destroy enemy fighters and aircraft.

FLAK
Shrapnel fired into the air by AAA for the purpose of destroying enemy aircraft.

FLAPS
The hinged portion of an aircraft's wings which can be used to increase lift.

FLARE
Incendiary device ejected by an airplane in an effort to confuse an incoming infrared-seeking missile.

FLIGHT DECK
The top deck on an aircraft carrier. It is where planes are launched and recovered.

FLY-BY-WIRE
A modern aircraft design which sends input from the pilot's stick into a flight computer which then controls movement.

FM
Frequency Modulation.

FOODFIGHT
Multi-plane aerial combat engagement. See also Furball.

FORE
The front of a ship. Also known as Bow.

FOV
Field-Of-View

FOX ONE
Pilot call on launching a radar guided missile.

FOX TWO
Pilot call on launching a Sidewinder.

FQ
Forward Quarter.

FURBALL
Multi-plane aerial combat engagement. See also Foodfight.

FWD
Forward.

G
Acceleration in gravity units. See G-Force.

GLOSSARY (CONT.)

GAI
See Ground-Alert Interceptor.

GAMMA
The designation used for a mission wing that will be conducting Fighter Sweeps.

GBL
See Gun Boresight Line.

GBU
Guided Bomb Unit.

GCI
Ground-Controlled Intercept.

G-FORCE
A measure of the force of acceleration,
in velocity or direction, induced by an airplane and its pilot.

GLIDE PATH
The imaginary corridor a plane travels on final approach.

GREYOUT
Greyout occurs when gravitational stresses impair the flow of blood to your brain. Loss of vision and, eventually, unconsciousness, can occur when you pull heavy G's.

GROUND ALERT INTERCEPTION
Ground Alert Interception is a mission order which scrambled fighters from the ground to intercept incoming threats.

G SUIT
The flight suit worn by pilots to counteract the G forces experienced in flight.

GUN BORESIGHT LINE
The imaginary line through the center of the gun barrel. Used in calculating lead angle. Also known as GBL.

HANGAR
The deck on an aircraft carrier that is located just beneath the Flight Deck.

HARD DECK
Lower altitude limit usually imposed during training.

HARM
A high speed anti-radiation missile, this weapon utilizes a passive seeker to detect and home in on hostile radars.

HCU
Hand Control Unit.

HDG
The direction that the plane is flying. See Heading.

HEADING
The direction of travel expressed in 360 degree increments from North (such that due South is 180). Also HDG.

HEAD-UP DISPLAY.
An optical device delivering important information to a pilot in his forward line-of-sight. Also HUD.

HEAT-SEEKING MISSILE
An anti-aircraft missile that detects and attempts to follow a source of Infrared radiation, typically the exhaust.

HEAT SIGNATURE
The Infrared heat given off by an object, usually an aircraft.

HIT
A disabling blow to an aircraft.

HORIZONTAL SITUATION DISPLAY
Two-dimensional representation of relative target and threat positions. Also HSD.

HORIZONTAL STABILIZER
The horizontal section of the tail, which provides downward lift to balance the weight of the nose.

HOT START
A start that exceeds normal starting temperatures.

HSD
See Horizontal Situation Display.

HSI
Horizontal Situation Indicator.

HUD
See Head-Up Display.

HUNG ORDNANCE
Bombs or missiles that failed to separate from the aircraft when released. Makes for a potentially dangerous landing.

HUNG START
A start that results in a stagnated rpm and temperature.

IAS
Indicated Airspeed

IADS
Integrated Air-Defense System

IFF
Identification, Friend or Foe

ILS
Instrument Landing System

IMMELMANN
A flight maneuver composed of a vertical quarter-loop followed by a partial roll, and finished with a second quarter-loop and half-roll.

INCOMING
Any threat, typically a missile, approaching an airplane.

GLOSSARY (CONT.)

INFRARED
An invisible portion of the electromagnetic spectrum emitted by heated objects. One source of tracking information for anti-aircraft weapons. Also known as IR.

INS
Inertial Navigation System

IN THE GROOVE
An aircraft correctly positioned on final approach.

IN THE SADDLE
Astride an opponent's "six", ready for attack.

INSIDE LOOP
A maneuver whereby an airplane continually raises its nose to complete a vertical circle while keeping its lateral centerline horizontal. Used to reverse positions with an opponent directly behind.

INVERTED FLIGHT
Flying upside-down.

IR
See Infrared.

IRCM
Infrared Countermeasures used to confuse Heat Seeking Missiles.

JAMMING
The act of confusing the an enemy's radar tracking system. See ECM.

JINK
Any maneuver used to make the distance or angle between opponents less advantageous to the attacker.

KAPPA
The designation used for a mission wing which will be providing CAS.

KCAS
Knots Calibrated Airspeed.

KFT
Units of measure in thousands of feet.

KIAS
Knots Indicated Airspeed.

KILL
Mortal blow to an opposing aircraft.

KILL BOARD
The board on a carrier where the pilots' confirmed kills are posted.

KNOT
Unit of speed, one nautical mile per hour, which is about 1.15 miles per hour.

KTAS
Knots True Airspeed.

KTS
See Knots.

LAG PURSUIT
A combat maneuver where the pursuing pilot aims the nose of his aircraft just behind the enemy's position and follow it through a turn.

LANDING BOARD
The board on a carrier where the pilots' landings are posted and rated.

LANDING SIGNAL OFFICER
Standing on the carrier deck, this man is in constant contact with the pilot of an aircraft about to land. He both guides and grades the landing. Also known as LSO.

LANTIRN
Targeting system for Mavericks and laser guided bombs

LCK
See Lock.

LCOS
Lead-Computing Optical Sight.

L/D
Lift-to-Drag ratio.

LDB
See Low Drag Bomb.

LE
Leading Edge.

LEAD PURSUIT
A combat maneuver where the pursuing pilot aims the nose of this aircraft just ahead of the enemy's plane.

LIFT
Force created by an Airfoil moving through atmosphere, perpendicular to the direction of motion.

LOCK
Usually referring to a missile lock. A lock is required for a high probability of success in a missile attack. Also known as LCK.

LOCK ON
Radar concentrating on target in attack mode. Acquiring a target for the purpose of attacking it.

LOGBOOK
A pilot's record of flying achievements including flight hours, takeoffs, landings, and maneuvers mastered.

LOOP
Any of a class of maneuvers in which an aircraft describes a closed filigree (usually a circle), its pitch attitude passing evenly through 360 degrees.

LOS
Line Of Sight.

LOW DRAG BOMB
Free-fall ordnance of especially low aerodynamic drag.

LSO
See Landing Signal Officer.

GLOSSARY (CONT.)

M
See Mach

MAN
See Manual.

MACH
Velocity as compared to the local speed of sound. For example, Mach 1.5 is one and one-half times the speed of sound at the current barometric pressure and temperature. Also known as M.

MANUAL
A system which is operated by manual control. Also refers to a pilot's act of switching from automatic to manual controls. Also known as Man.

MARSHAL POSITION
An area aft of a carrier where aircraft waiting to land assemble to await their turn.

MAV
See Maverick.

MAVERICK
An effective air-to-surface weapon which utilizes a TV seeker or laser-guidance to lock and track targets. It can reliably hit moving targets at long range. Also known as MAV.

MEATBALL
Glide slope image of mirror landing system.

MIA
Missing In Action.

MiG
Mikoyan/Gurevich. The Russian manufacturer of many Eastern Bloc fighters.

MILITARY THRUST
The current aircraft's full power. Speed settings are given in percentages of full military thrust.

MINIMUM CONTROLLABLE AIRSPEED
The speed below which your control surfaces do not generate significant force to control the plane.

MK84
A two thousand pound bomb.

MK82
A five hundred pound bomb.

MSL
Mean Sea Level.

MRM
Medium Range Missile.

MULTI-FUNCTION DISPLAY
Device used to show selected information. Also known as MFD.

NEGATIVE Gs
The gravitational force experienced by a pilot in a rapid descent.

NM
Nautical Miles

NFO
Naval Flight Officer

OBC
On-Board Check.

O'CLOCK
A representation of position relative to an airplane corresponding to a clock face. The nose of the plane is considered to be 12:00 and the rear is 6:00.

OMEGA
The designation used for a mission wing that will be conducting air defense suppression attacks in preparation for bombing runs. Also known as Wild Weasel.

ON BEAM
Properly aligned on an ILS approach.

ON YOUR SIX
Pilot jargon referring to the location directly behind an airplane. See Six.

OPERATIONS
The main control area on an aircraft carrier. It is where command decisions are made about overall tactics, schedules, and missions.

OPS
See Operations.

OPTICALLY GUIDED
A missile or bomb that is directed to its target, via radio control, by a person viewing the target on long-range TV.

OVERSHOOT
The act of flying past an enemy plane. An overshoot can be extremely dangerous since it exposes the plane's Six to enemy attack.

OVERTAKE
Closing speed irrespective of relative aspect or heading.

PAINTED
The act of being illuminated by radar.

PAYLOAD
The weapons carried by an aircraft.

PD
See Pulse-Doppler.

PDCP
Pilot's Display Control Panel.

PH
See Phoenix missile.

PHOENIX MISSILE
An air-to-air missile which uses active-radar to lock onto targets. It is the biggest of the American air-to-air missiles

PICKLING
The act of selecting a weapon.

PIPPER
Optical representation of aiming point for weapon in the HUD.

GLOSSARY (CONT.)

PITCH
Up or down. The angle of the plane's nose-to-tail axis relative to horizontal. To raise or lower the nose of an aircraft in flight.

PORT
The left-side of a naval vessel.

POSITIVE Gs
The gravitational force experienced by a pilot in a rapid ascent.

POW
Prisoner of War.

PULLING LEAD
The act of aiming a weapon ahead of an opponent's current position to improve the probability of a Hit.

PULSE DOPPLER
A kind of radar which emits a pulsed signal.

PURE PURSUIT
A combat maneuver where the following pilot mimics the enemy's tactics

QUARTERDECK
The stern area of a ship's upper deck. It is frequently the part of a ship which is set aside for ceremonial or official use.

QUARTERMASTER
A petty officer who attends to a ship's helm, binnacle and signals.

RADAR-GUIDED MISSILE
A missile that is guided to a target by reflection of radio signals off the target.

RANGE
Distance to a target.

RAPID DEPLOYMENT FORCE
A branch of the United Nations' military which was formed to respond quickly to aggressive conduct. Its naval air wing is based on the U.N.S. Peacekeeper, a Nimitz-class aircraft carrier. Also known as RDF or UNRDF.

RATE OF CLOSURE
Rate of decrease in distance to a target.

RATE OF DESCENT
Rate of loss of altitude, expressed in feet per minute.

RED FLAG
Tactical exercises held at Nellis AFB.

REDLINE
For a given airplane, the airspeed above which it is unsafe to fly. "Redlining" the plane may overstress or even damage structural elements in the plane.

REDOUT
The loss of vision or consciousness which may occur when a pilot pulls too many negative Gs. It is caused by an overabundant blood supply to the head.

RECON
Reconnaissance.

RDF
See Rapid Deployment Force.

RDR
Radar.

RIO
Radar Intercept Officer.

RIX
Recovery duty officer.

ROLL
The angle of the plane's wings relative to horizontal.

ROE
Rules Of Engagement.

ROOKIE
A new or inexperienced pilot.

ROT
Range On Target.

RQ
Rear Quarter.

RUDDER
The hinged, movable section of the plane's vertical stabilizer used to control the aircraft's yaw. As a verb, meaning to angle the rudder in a particular direction.

RWR
Radar-Warning Receiver.

SAM
Surface-to-Air Missile. An anti-aircraft weapon.

SAR
Search And Rescue. Generally referring to a mission.

SCISSORS
A dangerous series of nose-to-nose turns and overshoots where each aircraft tries to get behind the other one. Also known as ZigZag.

SCRAMBLE
Ground and flight crews racing to get airplanes airborne, typically for a military emergency.

SERVICE CEILING
The high altitude limit on an aircraft. Exceeding the service ceiling may overstress or damage structural elements in the plane.

GLOSSARY (CONT.)

SIDEWINDER
An Infrared-homing air-to-air missile. The Sidewinder has scored more ATA kills than any other missile.

SIGMA
The designation used for the AWACS mission wing.

SIGNAL CHARLIE
The signal called by the Air Boss aboard a carrier to inform a pilot that he is clear to land.

SIX
Pilot jargon for the location direction behind an airplane. See O'Clock.

SMART WEAPON
An air-to-ground weapon which can automatically lock onto and guide itself towards a target.

SORTIE
A mission.

SP
See Sparrow.

SPARROW
A radar-guided air-to-air missile. During combat, the missile Paints its target and homes in on the signal.

SPEEDBRAKE
A control surface that is extended into the airstream of an aircraft to increase drag and thereby reduce velocity.

SPIN
Any maneuver in which one wing is stalled and one is not.

SPLIT-S
A maneuver accomplished by rolling inverted and performing one-half of a loop, ending upright-side-up but traveling in the opposite direction at a lower altitude.

SPOOF
Successfully redirecting an incoming anti-aircraft missile.

SRM
Short Range Missile

STALL
A loss of lift experienced by a plane. It is general caused by either inadequate speed or too steep an AOA. See also Spin and Stall Speed.

STALL SPEED
The speed at which an aircraft will Stall.

STARBOARD
The right-side of a naval vessel.

STBY
Standby.

STICK
A control in the cockpit which controls the elevators (forward/back axis) and the ailerons (left/right axis).

STEM
The front of a ship. Also known as Bow or Fore.

STERN
The rear of a ship. Also known as Aft.

STORES
Anything that can be loaded on an aircraft, including weapons.

STORES MANAGEMENT DISPLAY
A graphic representation of the status of weapons and supplies.

STT
Single Target Tracking.

SUPERCRUISE
The ability to fly at speeds in excess of Mach One, without using an afterburner.

S/W
See Sidewinder.

TAA
Target-Aspect Angle.

TAIL HOOK
See Arrestor Hook.

TARCAP
See Target Combat Air Patrol.

TARGET COMBAT AIR PATROL
Mission type instructing the pilot to engage any aircraft crossing into his patrol zone. This order is used to protect friendly bombers who are engaging a target from counterattacks by enemy fighters.

TARGET BEARING
The position of the target as compared to the front of your plane. It is expressed in 360 degree increments where the nose of your plane is 0 and your Six is 180.

TARGET DESIGNATOR
An optical "box" surrounding a selected target as viewed through the HUD.

TARPS
Tactical Air Reconnaissance Pod System.

TAS
True Airspeed.

TAXIING
The act of steering an aircraft on the ground.

THERMAL
Air rising or falling due to temperature, and thus pressure, differentials; useful in soaring.

GLOSSARY (CONT.)

THETA
The designation used for a mission wing that will be conducting special operations such as recon, deliveries and such.

THROTTLE
The control in the aircraft's cockpit which allows the pilot to adjust thrust.

TID
Tactical Information Display.

TOF
Time Of Flight.

TONE
An audio cue emitted by a missile tracking system to indicate that the missile has Locked on the target and is ready to be fired.

TOWER
See Control Tower.

TR
Turn Rate.

TRANSPONDER
A device which transmit a coded response (that may include nationality, altitude, speed, and heading) to friendly units.

TRAP
The act of successfully capturing a cable with an arresting hook and landing on an aircraft carrier.

UN/C
Pilot jargon for joint operations of the United Nations and Chilean government.

UNRDF
The United Nations Rapid Deployment Force. See Rapid Deployment Force.

UNS
United Nations Ship.

USGS
The United States Geological Survey. This government agency collects terrain data and information.

VEC
Vector.

VERT
Vertical.

VID
Visual Identification.

V/STOL
An aircraft capable of vertical short-takeoffs and landings.

VELOCITY
An aircraft's airspeed, measured in either nautical miles or Mach.

VERTICAL HALF-LOOP
The first half of an inside loop, terminated at the top, inverted with a half-roll back to right-side-up and level flight.

VISUAL CONFIRMATION
Sighting of a bogey aircraft to determine nature and threat.

VULCAN
A rapid fire rotary cannon used on many fighters. Currently known as M61A1.

WAYPOINT
The different spots or target to which pilots must fly during a mission.

WILD WEASEL
Mission order instructing a pilot to attack enemy air defense positions, usually in preparation for a bombing attack. Also known as Omega.

WINGMAN
The pilot assigned to fly an aircraft in support of another aircraft.

WCS
Weapons Control System.

WHEEL BRAKE
The locking mechanism on an aircraft's wheels to prevent the plane from rolling.

WOD
Wind over the Deck.

X-SECTION
The cross section of an aircraft or other object.

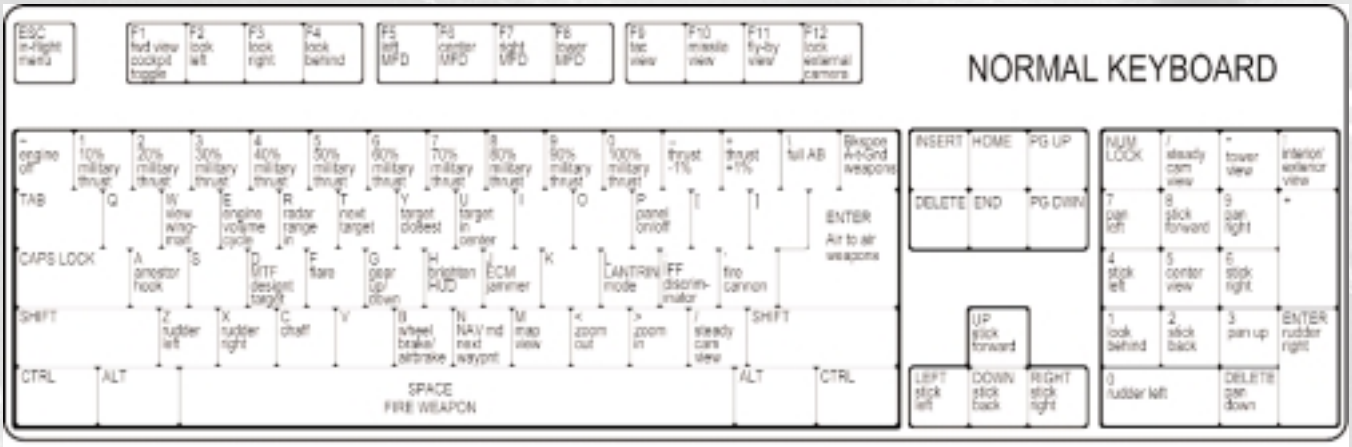
YAW
The angle of the plane's nose-to-tail axis relative to its direction of motion.

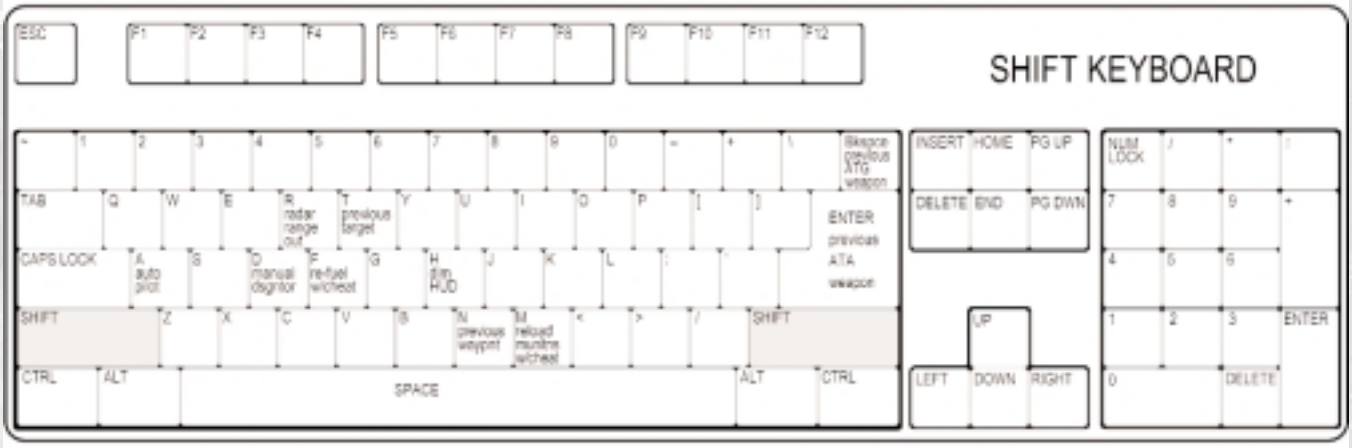
YO-YO
An offensive combat maneuver used to keep inside an enemy's turn.

ZONE
The primary mission area.

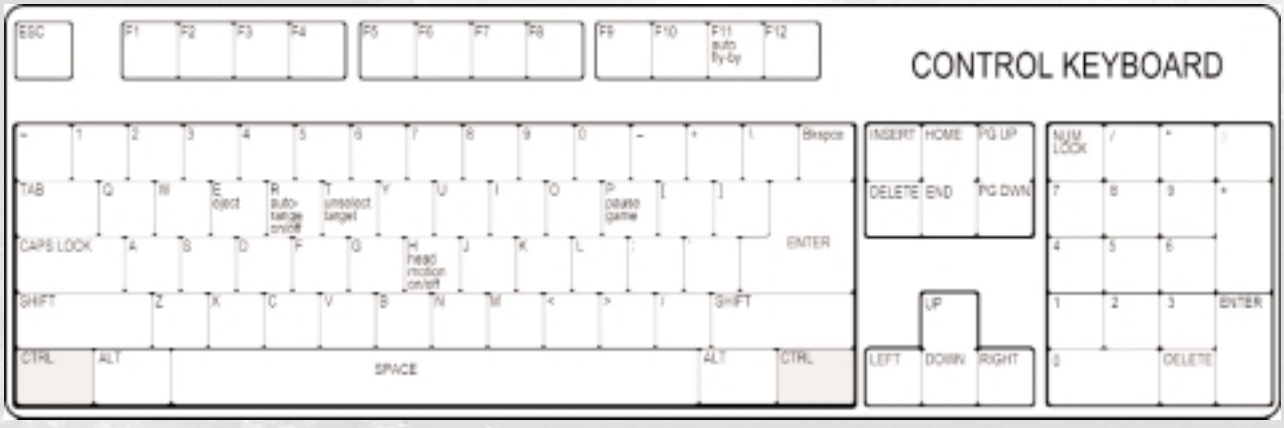
KEYBOARD ASSIGNMENTS

KEYBOARD ASSIGNMENTS





KEYBOARD ASSIGNMENTS (CONT.)



FUNCTION KEY

Flight Controls

Stick Back ..... Numpad 2
Stick Forward..... Numpad 8
Stick Right ..... Numpad 6
Stick Left ..... Numpad 4
Rudder Right ..... Numpad [Enter]
Rudder Left ..... Numpad [Ins]

Throttle

10% thrust..... 1
20% thrust..... 2
30% thrust..... 3
40% thrust..... 4
50% thrust..... 5
60% thrust..... 6
70% thrust..... 7
80% thrust..... 8
90% thrust..... 9
100% thrust..... 0
1% increase ..... +
1% decrease..... -
Full Afterburner ..... \
AB stage increase
(100% thrust)..... +
AB stage decrease
(100% thrust)..... -
Engine off ..... ~
Landing gear (up/down) .. G
Arrestor hook (up/down) .. A
Wheel Brake / Airbrake.... B
Autopilot ..... [Shift A]

DISPLAY OPTIONS

Resolution

Screen size cycle.....[Alt] [F5]

Features

Clouds ..... [Alt] C
Visibility distance..... [Alt] V

HUD Control

HUD brighter ..... H
HUD dimmer ..... [Shift] H
LANTIRN
mode L
Altimeter mode
(MSL / AGL)..... [Alt] A

Navigation

Waypoint next/
Nav mode ..... N
Waypoint previous [Shift] N

VIEW CONTROLS

PRE-SET Views

Forward view..... [F1]
Look left..... [F2]
Look right..... [F3]
Look behind..... [F4]
Defensive MFD (left)..... [F5]
RADAR MFD (center)..... [F6]
Offensive MFD (right) ..... [F7]
Systems MFD (lower) ..... [F8]
Tactical view ..... [F9]
Missile view..... [F10]
Fly-by-view ..... [F11]
“Steady cam” view ..... [F12]
View Wingman ..... W
Tower view .....
Numpad*
Cockpit panel (on/off) ..... P
Map view..... M
Switch internal/
external view .....
Numpad -

ADJUSTABLE VIEWS

Virtual cockpit
enable ..... joystk btn 1
Switch internal/
external view ..... Numpad -
Center view ..... Numpad 5
Pan up ..... Numpad 3
Pan down..... Numpad [Del]
Pan left..... Numpad 7
Pan right ..... Numpad 9
Zoom in ..... >
Zoom out ..... <

COMBAT

TARGETING

Target next ..... T
Target previous ..... [Shift] T
Target nearest..... Y
Target center..... U
IFF Discriminator..... ;
LANTIRN
mode L
Manual Designator
activate ..... [Shift]D
Manually Designate
target ..... D
Deselect target .. [Ctrl]

RADAR
Range zoom in ..... R
Range zoom out ..... [Shift] R
Autorange (on/off) ..... [Ctrl] R
On-screen (on/off) ..... [Alt] R

Weapons

Air to Air ..... [Enter]
Air to Ground..... [Backspace]
Fire Weapon ..... [Spacebar]
Fire Cannon..... “

Defense

ECM jammer ..... J
Flares..... F
Chaff C
Eject..... [Ctrl] E

Wingman

WM: follow me ..... [Alt] F
WM: attack target .....[Alt] G
WM: hold position ..... [Alt] H

Special Commands

Pause ..... [Ctrl] P
In-Flight menu ..... [Esc]
Time compression
(2:1, 3:1, off) ..... [Alt] T
Landscape Transversal
mode (on/off)..... [Alt] S
Head movement ..... [Ctrl] H
Exit game ..... [Alt] X

Cheats

Unlimited fuel ..... [Shift] F
Reload munitions ..... [Shift]M

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