Falcon¨ 4.0 Demo

About *Falcon 4.0*

Falcon 4.0 carries on the tradition of presenting the most accurate, realistic and engaging F-16 flight simulator available anywhere. Within *Falcon 4.0*, you'll pilot the F-16 Fighting Falcon, one of the premiere dogfighting and air-to-ground combat aircraft in the world today. The F-16 is a favorite of experienced combat pilots and is widely used by the United States and allied air forces. *Falcon 4.0* simulates the F-16 with unbelievable realism. This is as real as it gets!

Inside the complete version of *Falcon 4.0*, you'll find four main arenas of play along with several support sections. The main arenas are Instant Action, Dogfight, Tactical Engagement and the Campaign. This demo version only includes Instant Action, but we'll describe the other major areas to give you an idea of what you're missing!

Instant Action

Instant Action is the place to go for an immediate adrenaline fix. In Instant Action you find yourself in the air, surrounded by the enemy. Your job is to shoot down as many aircraft and blow up as many ground targets as you can before you get killed. And you'll have to be pretty good to avoid getting killed. Because in Instant Action, the enemies keep coming. There is an unlimited supply. That's the point. Instant Action puts you into battle without any preliminaries. You go for points and try to stay alive as long as possible.

Dogfight

You'll go to Dogfight to duke it out in the skies under more controlled circumstances. In Dogfight, you'll go head-to-head with as many as 15 other aircraft at once in the battle area. It can be a free-for-all or you can join up in teamsÑup to four teams of four players each.

Tactical Engagement

This is the *Falcon 4.0* construction set. In Tactical Engagement, you'll build your own complete air and ground scenarios, creating your own campaign-like missions. Or you can load in missions and scenarios that come with *Falcon 4.0*, that your friends create or that you find on the Internet. Tactical Engagement is the ultimate free-form mission builder.

Campaign

This is the ultimate challenge. You are a highly trained F-16 pilot, a combat veteran. You've gone through the program, you've learned your stuff. Now you are being assigned to a complex war in which you'll play a small but important part. The *Falcon 4.0* campaign is a highly complex real-time simulation engine that wages a major war on the Korean peninsula.

The Logbook

You'll set up the logbook with your name, tactical call sign and other personal information about yourself. This helps *Falcon 4.0* know it's you who's flying and keep track of your points, rank and other statistics.

Tactical Reference

This is an important study guide for staying alive in the air. The Tactical Reference shows you every aircraft, weapon, ground unit and sea unit you'll encounter in the *Falcon 4.0* arena. The way to stay alive is to know your enemy and Tactical Reference is where you learn it.

ACMI

Air Combat Maneuvering Instrumentation is the package that records everything that happens during a *Falcon 4.0* mission, whether it is in Instant Action, Dogfight, Tactical Engagement or Campaign. It's one of the most useful tools you have as a fighter pilot because it gives you a chance to review and evaluate your mission, see your mistakes and glory in your brilliant moves.

Setting Up *Falcon 4.0*

Falcon 4.0 System Requirements

The *Falcon 4.0* demo requires the following minimum system requirements:
   IBM PC 133MHz Pentium compatible with a Voodoo 3Dfx video accelerator card **OR** IBM PC 166MHz Pentium compatible
   Windows 95
   DirectX version 5.0
   32MB RAM
   Quad-speed CD-ROM drive
   High Color graphics for 800 x 600 x 16-bit color (video card must be compatible with DirectX 5.0 and have 2MB video RAM minimum)
   Hard drive (20MB free)
   Mouse
   DirectX-compatible sound card
   DirectX-compatible joystick

We recommend the following:
   IBM PC Pentium II compatible
   64MB RAM
   Voodoo 3Dfx video accelerator card
   Hard drive (51MB free)

How to Install the *Falcon 4.0* Demo

Note: Windows 95 must be installed on your computer before you can install the *Falcon 4.0* demo.
1.   Turn on your computer to start Windows 95.
2.   Insert the *Falcon 4.0* demo disc into your CD-ROM drive.
3.   Double-click SETUP.EXE.
4.   Follow the onscreen instructions to install the *Falcon 4.0* demo.
5.   At the "Determine Computer" screen, please choose the computer type that most closely matches your computer. Based on your selection, the *Falcon 4.0* demo will provide default graphics settings (which you can change later).
6.   When the installer asks, "Do you have a Voodoo 3Dfx graphics card installed?" click the "Yes" button if you do. Please note that the *Falcon 4.0* demo is not compatible with Voodoo Rush cards, such as the Hercules Stingray 128 2D/3D, which combine 2D and 3D on the same video card. All 3D-only Voodoo cards, such as the Diamond Monster 3D, are compatible with this demo. If you click the "Yes" button and you do not have a Voodoo 3Dfx card, the game will turn on "Texture Smoothing" which will make the demo run much more slowly.
7.   At the "Setup Options" screen, click "Compact" if you want to use less hard drive space. The Compact version only requires 20MB of hard drive space, but you must keep your *Falcon 4.0* demo disc in your CD-ROM drive. The Complete version requires 51MB of hard drive space, but you will not need the *Falcon 4.0*

demo CD-ROM. (Please note that you also need additional hard drive space for the Windows 95 swap file. We recommend at least 30MB free.)

How to Run the *Falcon 4.0* Demo

Note: DirectX version 5.0 must be installed on your computer before you can run the *Falcon 4.0* demo. If you do not have version 5.0 installed, you can update from the files supplied on the *Falcon 4.0* demo disc.

8. Turn on your computer to start Windows 95.
9. Make sure your joystick is calibrated in Windows 95 before starting the *Falcon 4.0* demo. Double-click the "Game Controllers" control panel. Click the "Add" button to view the list of possible joysticks. Click on the one corresponding to your joystick. (Note that if you have a ThrustMaster stick, please click the generic joystick corresponding to your stick instead of the ThrustMaster-specific ones.) Click the "Properties" and then "Calibrate" buttons to calibrate your joystick. You can test your joystick's range of motion and buttons by clicking the "Test" tab.
10. If you installed the Compact version of the demo, insert your *Falcon 4.0* demo disc into your CD-ROM drive.
11. Click the Start button and select "Programs."
12. From the Falcon 4.0 group, choose either "Falcon 4.0 Demo 3Dfx" if you have a Voodoo 3Dfx card or "Falcon 4.0 Demo" if you do not.
13. After the demo loads, click the "Setup" button on the left-hand side to configure your joystick. Click the "Controllers" tab and then the "Calibrate" button. Follow the directions onscreen. You can also test your joystick buttons. Click the OK button to exit the Setup screen.
14. Click the "Instant Action" button to configure your Instant Action mission. When you're ready to fly, click the F-16 icon in the lower right-hand corner.
15. Please read the complete demo Readme for further instructions on how to fly and fight in your F-16.

Configuring

You can configure many of *Falcon 4.0*'s options by clicking Setup from the main screen. The setup screen has four tabs across the top: Simulation, Graphics, Sound and Controllers.

Simulation

You control how realistic the simulation is from this screen. You may select the following choices:

Skill level

You choose the skill level from a pop-up menu. The choices are Ace, Veteran, Rookie, Cadet and Recruit. Choosing one of these skill levels automatically presets various game parameters to match the skill level you choose. You can also modify these individual parameters afterwards.

Realism Rating

This gives you a numeric value of how realistic your settings are. The range is from 100 to 0.

Flight Model

You may select between two flight model settings: Accurate or Simplified. The Accurate setting simulates the real flight model of the F-16. The Simplified setting eliminates the forces of drag, you bleed off less energy while turning and you accelerate more smoothly. It is also more forgiving at low speed.

Avionics

You may choose among three avionics modes: Easy, Simplified and Realistic

Easy shows every aircraft that is in the air at all times. It provides a look-down (God's-eye) view of the air arena. The Simplified display only shows aircraft that are in front of you and is closer to the real APG-68 radar. The Realistic radar mode simulates the real AN/APG-68 radar and submodes.

Weapons Effects

You can choose from three weapons effects settings: Accurate, Enhanced and Exaggerated. When the setting is Exaggerated, you don't have to be very accurate with your weapons to score a kill. Enhanced requires you to be a little more precise. Accurate requires that you accurately hit the target in order to record a kill.

Autopilot

There are three autopilot settings you may choose among: 3-axis, Steerpoint and Combat. When you choose 3 axis, the autopilot keeps your aircraft flying straight and level at whatever heading and altitude you were at when you engaged the autopilot. This is the most realistic setting.

The Steerpoint setting causes your F-16 to automatically fly to the current steerpoint. There are preset steerpoints in Instant Action that correspond to the air bases you can land at.

If Autopilot is set to Combat, the F-16 will actually engage in combat maneuvers all by itself. It will evade attacking aircraft and try to get you into position to shoot down any enemy aircraft.

There are also a number of check boxes that turn certain features on or off. These features are:

Invulnerability

This setting makes you invulnerable to any damage except crashes. It sets your Realism rating to 0 and you will always score 0 points.

Unlimited Fuel

If this is checked, you don't have to worry about finding a flying Texaco or hitting your bingo limit. You'll never run out of fuel. If unchecked, you have a normal fuel complement. In this demo, you *will* run out of fuel since you only have 8,000 pounds, so keep your eye on the fuel gauge (or keep an eye out for a tanker).

Unlimited Chaff and Flares

If checked, you can shoot off chaff and flares as often as you like. If unchecked, you have a specific load of 30 chaff bundles and 30 flares.

No Collisions

If checked, you can run into anything (except the ground) and you won't die. If unchecked, collision detection is on and you will crash if you run into things. This includes other aircraft and buildings.

No Blackout

If this is unchecked, you will be subject to the forces of gravity when you pull or push Gs. If you pull enough Gs, your vision will start to narrow until you succumb to gravity-induced loss of consciousness (GLOC). If you push too many negative Gs, you will burst tiny blood vessels in your eyes and your vision will go red. If No Blackout is checked, you won't notice any visual effects from G forces, although they will still affect the dynamics of your aircraft flight.

Lift Line Cue

If checked, you will see a line with arrows drawn on the top of your cockpit while you're in the virtual cockpit. This is to give you a frame of reference while you are looking up. Otherwise, all you see is the blue, blue sky, with no sense of which way you're looking. If this is unchecked, the Lift Line Cue is not drawn.

Labels

When this is checked, you will see every military object (planes, ground units, boats) tagged with its name. This identifier floats just above the object as you look out any view. This is very useful for identifying objects, particularly small ones. If this is unchecked, you won't see the name label.

Weather

Weather is disabled in this demo. Checking this box turns on the cloud layer. This adds realism and can make flying and fighting more difficult because vision may be reduced. Clouds also take more computing power, so you may want to turn the weather off to increase performance. If this is unchecked, you will always be flying in clear skies.

Radio Calls Use Bullseye

If checked, all radio calls to you reference a preset location known as bullseye. If unchecked, radio calls reference your own location. This option is disabled in this demo, so all radio calls are relative to your own location.

If you change these settings, you will change the value of the Realism Factor.

Graphics

The graphics setup section lets you control the level of detail the simulation displays. You will want to modify these primarily to affect performance. The higher the level of detail, the better the scene looks, but more demands are made on your computer. Adjust the graphics settings to give yourself the best balance of visual realism and performance.

When you make selections in the setup screen, you can see the results of your selection in the box on the right of the screen by clicking the Render checkbox.

You can select among five sliders for graphic detail. The general rule is that moving the sliders to the left gives you a better frame rate but less graphic detail, while moving the sliders to the right give you better graphics but a lower frame rate.

Terrain Texture

As you move the slider to the right, you turn on terrain texture. The further to the right you move the slider, the further out the terrain texture is drawn. Moving the slider to the left decreases how far out it is textured. When the slider is all the way to the left, textured terrain is turned off.

Terrain Detail

As you move the slider to the right, you add more detail to the texture. You also increase the detail further out in the distance, thereby reducing the " popping" effect as mountains come into view. Moving the slider to the left decreases the amount of detail and how far out it is rendered.

Object Detail

Objects are drawn at various levels of detail depending on how far from them you are. If you move the slider to the left, you have to be very close to an object to see it at full detail. If the slider is to the right, the object will be drawn at full detail much further out.

Object Density

Moving the slider to the right increases the number of ground objects, usually in a city grouping. Moving the slider to the left will give you fewer ground objects.

Vehicle Magnification

When the slider is to the left, objects are drawn at their actual size. Moving the slider to the right increases their size. Vehicles are very hard to spot on the ground while flying, so setting the magnification to greater than their actual size can help you to find them. This magnification also applies to aircraft and missiles in flight. Increasing the apparent size of vehicles will make them appear to move slower.

There are also several check boxes that turn specific graphics details on or off.

Textured Objects

Every object in *Falcon 4.0* has a detailed texture map that is " painted" on the object whenever it is displayed. If you turn off Textured Objects, this texture map is not drawn. Objects won' t look as detailed, but you' ll get better performance.

Transparency

This setting provides transparent smoke when you fire a missile or shoot down an aircraft. This will work without a graphics accelerator card, but it is not recommended.

Texture Smoothing

This setting smoothes out the ground texture, giving it a somewhat more realistic look. This setting should only be used with a hardware accelerator card; otherwise, performance will suffer significantly.

Gouraud Shading

This setting blends the colors of untextured objects and terrain, such as water. If the Textured Terrain slider is all the way to the right, then this setting should be turned off.

Haze

This setting adds haze to the distance, so everything isn't so sharp against the horizon.

Sound

There is a lot of audio bombarding an F-16 pilot and the noise can get overwhelming. This section of the setup area lets you balance the volumes of the different sounds you're likely to encounter in *Falcon 4.0*.

Each of the following items has a volume slider and a test button. You can have more than one sound on at the same time. The sounds are:

Engine
Your basic engine noise.

Sidewinder
The "growl" your missiles make when they lock on to a heat source.

RWR

This is the Radar Warning Receiver, a passive device that lets you know if unfriendly radar units have locked on to you.

COM 1

Communication channel 1. Primary channel used by AWACS, your wingmen and your package.

COM 2
Communication channel 2. Background radio channel used by other packages.

Sound FX
Basic sound effects such as missile explosions and aircraft crashes.

Music
The music used within the program.

UI Sound FX

The feedback the program makes when you select options or choices in the main module screens.

Controllers

This section lets you set up your joystick and change the keyboard mapping of cockpit functions.

To calibrate your joystick, click the Calibrate button and follow the instructions.

Changing your keyboard mapping is not available in this demo. However, if you press a key, this screen will show you what function is assigned to that key.

Getting Airborne

OK, it's time to get you into the air. Here are the basics you'll need to know.

Basic Controls

The tools you'll use to maneuver your aircraft around in space are the stick and throttle. But in the F-16, the stick and throttle have come a long way from the ones you'll find in a crop duster.

The F-16 stick (more properly called the side-stick) is a pressure-sensitive device that measures movement from transducers on the stick. The F-16 is a "fly-by-wire" aircraft, meaning that the stick and throttle do not use mechanical linkages to other parts of the aircraft. Instead, these devices are "read" by the flight control computer and the proper signals are sent to the control surfaces via electronic link.

The F-16 also has rudder pedals, although the rudder is generally controlled automatically by the Flight Control Computer. *Falcon 4.0* supports rudder pedals in addition to joysticks and throttles.

HOTAS

One of the remarkable aspects of the stick and throttle in the F-16 is the proliferation of buttons and other controls. These controls allow the pilot to control all critical combat operations without taking his hands off either stick or throttle. The seconds this saves in a combat situation may easily save the life of the pilot. This system is known as Hands-On Throttle and Stick, or HOTAS.

If you are flying with an advanced joystick and throttle, such as the ThrustMaster TQS/FCLS setup, you will be able to operate *Falcon 4.0* in a manner very similar to a real F-16 pilot.

Head Up Display

One of the basic instruments you'll use is the Head Up Display (HUD), a piece of glass in the front of the cockpit upon which important navigation and weapons information is projected. It allows you to view this information without taking your eyes off the enemy and having to look down in your cockpit. The HUD gives you your altitude, airspeed and heading, along with other navigational information. It also provides critical information during combat.

MFD (Multifunction Display)

The F-16C revision incorporates two multifunction displays, which provide a wide variety of information about the operations of your aircraft. You'll used the MFDs for navigation, stores management, weapons status, radar and threat management. You select different options on the MFD either through your HOTAS controls, by pressing the Option Select Buttons (OSB) which surround each multifunction display (while in the Cockpit view) or with keyboard keys.

Views

In *Falcon 4.0*, you get to see the world via a number of different views. From these views, you'll construct the situational awareness needed to succeed in the combat arena.

Cockpit Views

The Cockpit views show the inside of your cockpit, along with the various instruments and systems you'll use to fly your aircraft. The default cockpit view is of the front cockpit view (1 on the top row of the keyboard). You'll see a hand icon that moves when you move your mouse. As the hand icon nears the edge of the screen, it becomes a pointer to let you know that there are more cockpit screens available. If you click the mouse when the cursor turns into an arrow, you'll see the next cockpit screen.

There are four main cockpit screens: front, lower, left and right. You can look in other directions while in cockpit view, but these views don't display any additional instrumentation. If you have a hat on your joystick, you can also use the hat to move through these views.

You'll use the hand icon to interact with many of the cockpit displays, particularly the MFDs and the Instrument control panel. The hand icon will point a finger whenever it is over a button you can push, and it will turn into a closed hand when it is over a knob you can turn. In this demo, many of the cockpit instruments are disabled.

No Cockpit view (Accent mark on the top row of the keyboard)

This view provides an unobstructed view out the front of the aircraft. The HUD is superimposed onto the view, but all cockpit structure disappears. You see the landscape as though you were flying free over the ground. You may, however, optionally turn on up to four views of the MFDsÑone MFD in each corner of the screen.

Virtual cockpit (2 on the top row of the keyboard)

The virtual cockpit keeps some of the cockpit displays available to you, but also provides you with a smooth scrolling view around your aircraft. Use the hat or the camera pan keys (numeric keypad keys 4, 8, 6 and 2) to look around.

Padlock view (3 on the top row of the keyboard)

When you select Padlock view, your screen is divided into two areas: the Padlock reference area to the left and an out-the-window view to the right. Padlock view locks you visually to the closest air threat in visual range. You will be looking at that target in the out-the-window view, and this view will smoothly pan to help you keep track of the target.

The Padlock reference area is a narrow band that represents a vertical 360-degree cylinder that goes through the center of your aircraft. The line down the middle represents the center-line of your aircraft. Of course, this cylinder has been flattened out to display on the screen.

There is a tick mark at the center of the vertical line. This represents the nose of your aircraft. A moving rectangle represents the field of view you see out the window. In order to point your nose at the tracked target (which is what you' ll need to do if you want to shoot him down), you need to fly your aircraft so that the rectangle moves to the tick mark on the line.

If the rectangle is to the right and above the tick mark, this indicates that you are looking up and to the right of the nose of your aircraft. Bank right and pull up on the stick. This will bring the rectangle over and down to the tick mark. You' ll also see your HUD swing into view on the right side of the screen.

Below the Padlock reference area are two readouts, one of which shows the position of your speed brakes. They can be anywhere in the range of 0, which is fully closed, to 100, which is fully open. There is also a readout for your throttle setting. This can be anywhere from 0 (throttle off) to 100 (military power). If you are in Afterburner, the throttle will read up to 150.

Extended Field of View (4 on the top row of the keyboard)

This is another useful view to help you gain situational awareness and track targets that are outside of the normal front view out your cockpit.

In Extended FOV view, you will immediately lock on to the closest visual threat, and if he is not directly in front of you, a small window appears at the bottom of the screen. In this window, you' ll see the enemy target visually, as though you had turned your head to look at him. In addition, a green arrow will appear along the edge of the screen to indicate the direction the target is in relation to your nose.

Once you bring the target to your nose, the window at the bottom of the screen disappears.

Outside Views

These outside views let you see the action from outside your aircraft. They almost all allow you to rotate the views using the hat or the 4, 8, 6 or 2 keys on the numeric keypad. In addition, you can use 1 and 7 on the numeric keypad to zoom in and out respectively.

Chase view (5 on the top row of the keyboard)

Chase view positions you directly behind your aircraft. If you bank your aircraft, the camera lags behind your movement for a moment and then repositions itself behind you again. This view gives the best sensation of movement while flying.

External view (6 on the top row of the keyboard)

External view starts directly behind your aircraft. You may also rotate the view around the center of the aircraft, which makes this view a good one to get a quick look around.

Zoom in and zoom out (1 and 7 on the numeric keypad)

You may zoom closer or further away from your aircraft while in an outside view. Use the 1 and 7 keys on the numeric keypad to zoom in or out.

Flying in Instant Action

Instant Action is the only module that is enabled in this demo, but it's the most exciting one, so you will get a good sense of the thrill and excitement you'll find when you purchase the full *Falcon 4.0* package. Here's how to get going.

How to Start Instant Action

To get into Instant Action, click the Instant Action menu item on the left of the screen. There are three sections of the Instant Action screen: the Options area, the Map and Sierra Hotel. At the bottom of the screen is an F-16 icon. Once you've set up your options, click the F-16 to launch into Instant Action.

Setting Your Instant Action Options

You use the Instant Action options area to customize your experience in Instant Action. There are three areas you can customize from within Instant Action. You can also use the main Setup options to further customize *Falcon 4.0*.

Mission

The mission options allow you to choose between a primarily air-to-air mission or a ground target mission. Choose Fighter Sweep for a predominately air-to-air combat experience. You will be presented with many air threats. Choose Moving Mud for more air-to-ground targets.

Wave

These settings determine the enemy difficulty level. Choose from Recruit, Cadet, Rookie, Veteran or Ace. The higher the level of enemy difficult, the smarter, faster and more deadly the enemy will be. This setting applies to both air threats and ground threats. You will also get more cargo planes and fewer fighter planes at the easier settings and correspondingly more fighters and fewer drones at the higher settings.

Air Defenses

Most countries don't like hostile aircraft flying over their airspace, so they do what they can to discourage this. One way to discourage you is to shoot at you from the ground. You'll find two types of ground threats in Instant Action that try to do just that: surface-to-air missiles (SAMS) and anti-aircraft artillery (AAA). These air defenses are disabled in this demo.

Finishing Instant Action

Instant Action doesn't have a real ending. You fly and fight until you decide to quit, land, eject, get shot down or run out of fuel. The enemies are unending and relentless. If you get shot down, the Instant Action mission will automatically end. You may also end at any time by pressing the Esc key.

When an Instant Action mission ends, you'll be returned to the Instant Action main screen. If you're fortunate enough to score enough points to put you in Sierra Hotel (the best of the best), you'll be asked to enter your name. Then you'll see the events list which displays all the weapons releases by your aircraft and by the enemy, along with the outcomes.

Next to the events list is the score list. This score is determined by your kills, multiplied by your realism setting. You'll get points for downing aircraft and destroying ground targets. You'll have points deducted from your score for expending munitions. The more weapons you use that do not hit targets, the lower your score (you may even have a negative score).

Weapons, Avionics, Instruments

The HUD

The HUD (Head Up Display) uses a projector to display important information on glass directly in your line of sight. This is one of the most important pieces of equipment you'll use during combat.

The HUD displays basic flight information, navigational information, weapons systems information, target information and landing cues. The real value of the HUD is that during combat, you have all the important pieces of information you need without having to look down into the cockpit to find it. The HUD gives you the critical information without having to take your eyes off the bad guys.

Each time you select a weapon, you will see an associated HUD mode for it. The HUD displays important information that is specific to that weapon. Each of the HUD weapons modes will be covered below, but there are some elements to the HUD display that tend to be common among all HUD modes, so we'll take a look at them first.

Basic HUD information

The HUD contains a number of items that are common to most HUD modes and are useful for normal flight. Each of these items is discussed below.

Airspeed

The airspeed indicator shows your current airspeed in nautical miles per hour (knots) There are two versions of the airspeed display: the discrete airspeed and the airspeed tape. You can toggle between them by pressing Ctrl-H.

The discrete airspeed indicator consists of a rectangle on the left side of the HUD with the airspeed displayed inside. The airspeed tape consists of a moving, calibrated display along the left side of the HUD. Airspeed is indicated every 50 knots with hash marks indicating every 10 knots. Airspeed is displayed as calibrated airspeed (CAS).

Altitude

The altitude indicators are on the right side of the HUD and they can be either discrete or displayed as an altitude tape. The discrete indicator gives altitude accurate to the foot inside the rectangle. The altitude tape show the thousands and hundreds values of the altitude (for example, "10,5" for 10,500 feet). The altitude tape is marked in increments of 100 feet.

The altitude measurement is your altitude above sea level, which may be different than your altitude above ground level (AL). There is an additional display on the HUD that shows your AL.

AL

The Above Ground Level indicator shows up in the lower right corner of the HUD under the altitude tape. It only appears when your altitude drops below a preset height of 3,000 feet. The AL indicator flashes to show you that you are getting dangerously close to the ground.

Heading

The heading indicator tells you which direction (according to the compass) you are heading. Headings are displayed in degrees with 0¡ = North, 90¡ = East, 180¡ = South and 270¡ = West. The heading tape is calibrated to indicate 5¡ increments.

Flight Path Marker

The flight path marker indicates the actual direction of flight your aircraft is taking. This may not always be the exact direction your F-16 is pointing. The flight path marker is displayed as a circle with three spokes representing your wings and tail. It will lag behind the center of the HUD as you bank and then slowly drift back to the center as you straighten out. If the flight path marker is below the horizon, you are descending towards the earth.

G Force Indicator

The G force indicator is a discrete readout in the upper left corner of the HUD. It indicates the G forces you are experiencing at any given moment. When you are flying straight and level, the G force indicator will read 1.0. By changing direction from the current line of force, you will experience the equivalent of multiple times the normal

pull of gravity. The F-16 can pull up to 9.0 Gs, although this will result in G-induced loss of consciousness (GLOC) and blackout. You may also incur negative Gs if you nose your aircraft down.

Max G Force Indicator

This indicator, in the lower left of the HUD indicates the highest G force your F-16 has experienced on the current mission. This indicator is automatically set to 0 at takeoff. This is the setting your crew chief will want to see, assuming you make it back, because it indicates how much you've stressed the airframe.

HUD Mode Indicator

The HUD mode indicator in the lower left corner of the HUD tells which HUD mode is currently being displayed. The HUD modes you might see are:

NAV	Basic navigation
SRM	Short-range air-to-air missile
MRM	Medium-range air-to-air missile
MSL	Missile override mode
ILS	Instrument landing system
EEGS	Enhanced envelope gun sight
LCOS	Lead computing optical sight
SNAP	Snapshoot
STRF	Ground strafe
DGFT	Dogfight
DTOS	Dive toss
CCRP	Continuously computed release point
CCIP	Continuously computed impact point
LADD	Low altitude drogue delivery
PRE	Preplanned electro-optical weapon deliver submode
BSGT	Boresight electro-optical weapon deliver submode
SLAVE	Slaved weapons delivery submode

Mach Indicator

Located above the max G force indicator, this displays the current airspeed as a percentage of Mach 1, the speed of sound.

Pitch Ladder

The pitch ladder appears in the center of the HUD and consists of parallel lines marked to indicate the angle of climb or dive. The lines also rotate to indicate the roll of your aircraft. As you climb or dive, the lines move accordingly. The lines orient to the horizon so as you roll, they continue to indicate the line of the horizon. The pitch ladder lines are marked in increments of 5 degrees of climb or dive and have tick marks on each end that point toward the 0¡ line. If you get disoriented in a climb or dive, steer the plane in the direction of the tick marks to come back to level orientation.

The pitch ladder is turned off by default. Turn it on by pressing the H key.

Steerpoint Marker

The steerpoint marker appears as a bold tick line above the heading tape. It indicates the heading for the current steerpoint. If the steerpoint heading is not in the viewable heading tape, the steerpoint marker will appear on the side of the heading tape closest to the steerpoint heading. As you bring your heading to that of the current steerpoint, the steerpoint marker will slide into position above the heading tape at the correct position.

Boresight Cross

This is the cross at the top of the HUD which represents the fuselage reference line. This symbol is displayed in most weapons HUD modes.

Steerpoint Info

In the lower right of the HUD while in NAV mode are three readouts containing steerpoint information. The top line is the time, in minutes, to the current steerpoint. The first item on the second line is the distance to steerpoint in nautical miles, and the second item is the number of degrees left or right off your nose to the current steerpoint.

Low Fuel

When your fuel gets to 1,000 pounds, you will see a message on your HUD saying WARN FUEL. This lets you know you'll soon be flying on fumes.

Other HUD Modes

The HUD will display special modes when air-to-air or air-to-ground weapons are selected. These HUD modes provide important targeting information to help with accurate weapons delivery.

Air-to-Air Missile

There are several HUD displays for missiles depending on the type of missile.

Medium Range Missiles (MRM)

AIM-120 RETICLE

When MRMs are selected, the HUD shows MRM in the HUD Mode Indicator. A large circular reticle appears in the center of the HUD. A target aspect angle marker appears on the circumference of the circle. If it is at 6 o'clock, the target aspect angle is 0 degrees. 12, 3 and 9 o'clock positions correspond to 180 degrees aspect, 90 degrees right and 90 degrees left aspect. The aspect marker may appear at any position on the circle.

If a selected target is within 12,000 feet, four ticks appear on the circle at 12, 3, 6 and 9 o'clock positions. A range gap, marked by a range tick, also opens in the circle starting at the 12 o'clock position and extends counterclockwise around the circle. This range tick indicates the selected target's range from you in thousands of feet. For example, if the tick and gap are at the 9 o'clock position, the target is 9,000 feet from you.

DYNAMIC LAUNCH ZONE/MANEUVERING ZONE SCALES

The Dynamic Launch Zone (DLZ) ranging scale is really two scales. The outer brackets represent the maximum and minimum range for non-maneuvering targets. When a caret appears to the left of this scale, it indicates that the designated target is within this range. A number to the left of the caret shows the target's closure rate.

The inner brackets are the maneuver zone markers. They indicate the maximum and minimum ranges for a successful launch against maneuvering targets.

The range of the DLZ corresponds to the selected radar range scale of 80, 40, 20, 10 or 5 nm. This number is displayed above the DLZ. The range will automatically set to 5 nm if the range to the target is less than 4.5 nm.

TARGET DESIGNATOR BOX AND LOCATOR LINE

A locked target shows up as a circle with four spokes inside a target designator box. At the lower right side of the HUD is the distance of the locked target. This readout is labeled with an F.

When the target is outside the HUD field of view, a target locator line is drawn from the gun boresight cross to the target. An angle-to-target display appears to the left of the boresight cross. It indicates the angle, in degrees, to the target.

When you launch a missile, you'll see the time of flight count down in the lower right corner of the HUD. The time of flight countdown is labeled with a T and counts down in seconds.

The attack steering cue appears as a small circle that moves within the larger reticle. It indicates whether the target is within the missile gimbal limits. If the attack steering cue goes outside of the large reticle, you have a reduced chance of a successful missile hit.

This is a small circle that moves up or down the DLZ. It indicates the range at which the missile's seeker head goes active.

Short Range Missiles (SRM)

When SRMs are selected, the HUD shows SRM in the HUD Mode Indicator. A medium-sized circular reticle appears in the center of the HUD. A target aspect angle marker appears on the circumference of the circle. If it is at 6 o'clock, the target aspect angle is 0 degrees. 12, 3 and 9 o'clock positions correspond to 180 degrees aspect, 90 degrees right and 90 degrees left aspect. The aspect marker may appear at any position on the circle.

If a selected target is with 12,000 feet, four tick marks appear on the circle at 12, 3, 6 and 9 o'clock positions. A range gap, marked by a range tick, also opens in the circle starting at the 12 o'clock position and extends counterclockwise around the circle. This range tick indicates the selected target's range from you in thousands of feet. For example, if the tick and gap are at the 9 o'clock position, the target is 9,000 feet from you.

The Dynamic Launch Zone (DLZ) ranging scale is really two scales. The outer brackets represent the maximum and minimum range for non-maneuvering targets. When a caret appears to the left of this scale, it indicates that the designated target is within this range. A number to the left of the caret shows the target's closure rate.

The inner brackets are the maneuver zone markers. They indicate the maximum and minimum ranges for a successful launch against maneuvering targets.

The range of the DLZ corresponds to the selected radar range scale of 80, 40, 20, 10 or 5 nm. This number is displayed above the DLZ. The range will automatically set to 5 nm if the range to the target is less than 4.5 nm.

A locked target shows up as a diamond inside a target designator box. At the lower right side of the HUD is the distance of the locked target. This readout is labeled with an F.

When the target is outside the HUD field of view, a target locator line is drawn from the gun boresight cross to the target. An angle-to-target display appears to the left of the boresight cross. It indicates the angle, in degrees, to the target.

AA guns
There are three aiming displays you can use for air-to-air guns.

Enhanced Envelope Gun Sight (EEGS)
The EEGS adds a funnel and a target designator to the HUD display.

The funnel pulls as you bank your aircraft, giving you a general indication of the path of bullets if they were fired continuously. It is also used to judge distance to the target. The minimum range, corresponding to the top of the funnel, is 600 feet. The maximum range, at the bottom of the funnel, is approximately 3,000 feet. If the target is smaller than the bottom of the funnel, it is out of range.

The target designator is a circle with a diamond in it. A range gap, marked by a range tick, opens in the circle starting at the 12 o'clock position and extends counterclockwise around the circle. This range tick indicates the selected target's range from you in thousands of feet. For example, if the tick and gap are at the 9 o'clock position, the

target is 9,000 feet from you. The maximum gun range is indicated by a dot on the circumference of the target designator.

Lead Computing Optical Sight (LCOS)

This is an alternative method of tracking enemy aircraft with guns. To hit an enemy, put the center of the circle on the target.

Snap Gun Mode

This is another alternative method of tracking enemy aircraft with guns. To hit an enemy, put the center of the circle on the target.

Press the Backslash key to cycle through these Fire Control Computer submodes.

Air-to-Ground Weapons

You have a large number of air-to-ground weapons to work with in *Falcon 4.0.* In this demo, you've got Mk82 500 lb. iron bombs, Maverick AGM-65 optically-guided missiles, the LAU 5003A rocket launcher and your M61A1 20mm Vulcan cannon.
Cycle through your air-to-ground weapons by pressing the BackSpace key.

CCIP Mode

CCIP stands for Continuously Computed Impact Point and is one method of accurately dropping iron bombs. Select CCIP by pressing the BackSpace key until CCIP appears in the lower left corner of the HUD. You will see a vertical bomb line with a circle at the bottom. The circle (pipper) is where a bomb will impact if you release at any given moment. There is also a short horizontal line that crosses the bomb line called the delay cue.

There are two methods of releasing the Mk82s using CCIP.

MANUALLY PICKLE THE BOMB

Line up on your target with your flight path marker just above the target. Keep the bomb line running through the target. Pitch down at least 5 degrees. At some point, the delay cue will disappear and the pipper will walk up the bomb line toward the target. Pickle the bomb (press the fire weapon button on your joystick) when the pipper is on the target.

You should immediately egress out of the area by banking to the side at least 60 degrees and pulling at least 5 Gs or else you're likely to get hit by the bomb blast.

LET THE FIRE CONTROL COMPUTER PICKLE THE BOMBS

Line up on the target and, when the pipper is over the target, press and hold the fire weapon button on your joystick. Fly so that you keep the pipper on the bomb line. The bomb line will eventually move quickly to the side of the HUD. When it moves back to the center, your bombs will be automatically released by the Fire Control Computer.

Maverick AG Missile

The Maverick is a TV-guided missile that is very effective in taking out tanks and other vehicles. It is a Òfire-and-forgetÓ weapon because, once you lock onto a target, the missile will track to the target independent of what you may be doing.

There are three Maverick modes, but youÕll only use two of them in this demo.

Boresight mode

Press the Backspace key to cycle through the air-to-ground weapons until you see BSGT in the lower left corner of the HUD. You will see a small square TD (target designator) box appear over the flight path marker. Turn on one of your MFDs (Multifunction Displays) and cycle through it until you see the SMS (Stores Management System). (If the SMS is on the Inventory page, press the Toggle SMS Page key (apostrophe) until it displays the Weapons page.) This activates the electro-optical system on the Maverick and feeds the data to your MFD, where it will be displayed as a video image.

Use the cursor keys to move the TD box until it is over your target and press the Designate Target key (0 on the numeric keypad). This ground-stabilizes the Maverick. Then use the cursor keys to fine-tune your aim. Press the

Radar Return to Search key (period on the numeric keypad) if you need to break the lock and lock the TD box back to the center of the HUD.

When the Maverick ÒseesÓ the target, a box will enclose it on the MFD. At this point the Maverick is locked on, and you can fire it by pressing the fire weapon button on your joystick. Press the Radar Return to Search key to clear the lock so you can select a new target.

If you are in the Easy avionics setting, Mavericks will maintain their lock even when they're not pointed at the target. If you are in the Realistic avionics setting, you must be pointed at the target for the Maverick to hit its target.

Slave mode

With the Maverick selected (BSGT mode), press the Backslash key to cycle through the Fire Control Computer submodes until the HUD mode indicator reads SLAVE. Set up one of your MFDs as you did for boresight mode.

Cycle your other MFD to radar mode and then select either Ground Map (GM) mode or Ground Map Tracking (GMT) mode by cycling the F2 key. Lock an enemy ground target (displayed as a red square in Easy and Simplified avionics) by pressing the Lock Next Target key (>) or move the radar cursor over the target with the cursor arrow keys and press the Designate Target key (0 on the numeric keypad).

Once you lock up a ground target, a small diamond will appear over the selected target and the Maverick TD box in the HUD will automatically slave to the target that your radar has locked up. Use the Radar Return to Search key (period on the numeric keypad) to break lock if you need to reestablish the lock or to lock a different target. Then press the fire weapon button to launch the Maverick.

Rocket Launcher

Your F-16 is equipped with a LAU-5003A rocket launcher pod. It launches small, 2.75-inch unguided rockets that are effective against light armor, vehicles and other soft targets. Cycle through your air-to-ground weapons until you see RCKT in the HUD mode indicator. Place the pipper on your target and press the fire weapon button.

AG guns

Put the pipper on your target and fire away. Try to remember to pull up before you actually crash into the target. Why waste those bullets if you're just going to blow him by plowing into him?

ILS

ILS stands for Instrument Landing System and is used to help you line up with runways on air bases. You will find ILS systems on the runways in *Falcon 4.0*, but you must be coming in from the right direction for ILS to work.

You get to the ILS HUD mode by cycling through the Fire Computer master modes (Shift-Backslash). You'll see a horizontal and vertical line on the HUD. If they are flashing as you approach the runway, you are entering from the wrong end of the runway. Go around to the other side.

Now the lines should be solid. Fly in the direction of the intersection of the lines. For example, if the lines touch each other at the bottom right, you need to descend to your right. As you line up with the runway, the lines should form a cross in the center of your HUD. Place the flight path marker at the beginning of the runway and glide right in.

Other HUD-Related Instruments

AOA Indexers

The AOA indexers are three lights to the left of the HUD glass. They consist of a down arrow, a circle and an up arrow. You use these lights to determine if your angle of attack (AOA) is correct for landing. If your AOA is too high, the top lamp (down arrow) lights up. This means your airspeed is too low and you need to increase throttle or drop your nose. If your AOA is too low, the bottom lamp (up arrow) lights up. This indicates that your airspeed is too fast and you need to decrease throttle or raise your nose. When the center lamp (circle) illuminates, your AOA is just right for landing. Your airspeed for landing should be between 150 and 170 knots.

HUD Control Panel

You may change the HUD display color. Use Alt-H to cycle through several different colors of the HUD display.

If you want to toggle the pitch ladder on or off, use the H key.

You can also switch between the discrete altitude and speed scales and the altitude and speed tapes. Pressing Ctrl-H toggles between these two displays.

Radar Modes

Falcon 4.0 supports three types of radar displays: Easy, Simplified and Realistic. The first two displays are made-up radar modes. We've included them to ease you into the real F-16 radar display: Realistic. The Realistic radar in *Falcon 4.0* is extremely close to the operation and function of the real AN/APG-68 radar found in the F-16C. This sophisticated radar suite is powerful and complex. With its many modes and operations, it can be a bit overwhelming to have to use it right from the start. So we've provided the other two modes to help you learn the basic concepts of radar. As you become comfortable with Easy mode, try out the Simplified mode, which is much closer to the APG-68 radar. It goes without saying that the Realistic radar mode will take some time to learn. While the Realistic radar mode is functional in this demo, you'll have to buy *Falcon 4.0* if you want the detailed documentation on how to use this radar. Once you master the APG-68, you'll be able to carry on an intelligent conversation with a real Falcon driver (at least about radar).

 o give you an immediate view of all the air and ground threats around you. It shows you reats, their relative altitudes from you and whether they are hostile, neutral or friendly.

The Easy display consists of two concentric circles with a pie wedge. The circles are range rings and the pie wedge is the view your radar sees in front of you (the radar cone). You are located in the center of that circle and the view is a god's-eye view looking down.

You set the range of the radar scan with the radar range keys (F3 and F4). You can set the Easy display to 80 nm, 40 nm, 20 nm, 10 nm or 5 nm. The outer circle represents the range your radar is set to. The inner circle represents half that range. For example, if the radar is set to 40 nm range, an aircraft at the outer circle would be approximately 40 nautical miles away. An aircraft at the inner circle ring would be approximately 20 nm away.

In Easy mode, you see every aircraft and ground target that is within the range set by your radar. Normally, an aircraft or ground target must be within the radar scan cone, which is in front of your aircraft. However, in Easy mode, you see everything in the 360-degree circle around you.

Each aircraft or ground target appears as a colored triangle. The colors represent the threat type. Red is hostile, green is neutral and blue is friendly. There is a number associated with each triangle. This number represents the differences in the aircraft's altitude, in thousands of feet, from your own. For example, "2" indicates that the aircraft is 2,000 feet above you. If it says "-1," it is 1,000 feet below you.

You can lock up a target (enemy targets appear in red) by pressing the Lock Next Target (>) or Lock Previous Target (<) keys or by pressing the Lock Target on Nose key (Slash). Pressing Lock Next Target locks the closest target to you that's within the radar cone. As you continue to press it, it locks on the next target (further away) and so on. Lock Previous Target works in the opposite way from Lock Next Target. While Lock Next Target goes from the current target to targets furthest away, Lock Previous target moves from the current target to the next closest target and so on. Lock Target on Nose will try to lock up any target that is directly in front of you.

You can also lock up any arbitrary target directly by moving the cursor bars (using the cursor keys) directly over the target on the radar display and pressing the Designate Target key (zero on the numeric keypad). Notice that the cursor bars always stay within the radar cone. A locked target will stay locked even if it moves outside the radar cone, but a target must be within the cone in order to *establish* a lock.

The Easy display shows a number of readouts around the display itself. Starting from the upper right and moving clockwise you'll find:

Radar mode
May be AA for air-to-air or AG for air-to-ground.

Auto (AA and AG)

Indicates that the radar will automatically try to lock up the closest threat. If you explicitly lock up a target or cycle through the threats, this readout will turn off. However, if you break lock on a target, the radar will go back into Auto mode and this display will reappear.

Bullseye
These readouts are not used in this demo.

Range scale
The current radar range is found between an up and down arrow. This indicates the range of the outer circle.

intermediate mode, somewhere between the simple, less realistic Easy mode and the de. It is visually like the APG-68 radar, but many of the chores are automated for you in

In this mode, rather than displaying a god's-eye view from above, the radar display is a 60-degree cone from center to edge, looking forward. Radar returns appear right or left of the center of the display proportionate to their actual position to the right or left of the nose of your aircraft. Their position between the top and bottom of the display indicates their distance from you, depending on the radar range.

For example, if the radar range is set to 40 nm and if there is a radar return halfway down the screen and halfway to the right of the screen, the aircraft that is being painted is to the right of your nose by about 30 degrees and about 20 nm in front of you.

Air-to-air mode

Simplified mode shows multiple returns and you can lock up a single aircraft while continuing to display the other returns. When you lock up an aircraft, you get additional information about that aircraft.

You can lock up an enemy target (which will appear in red) by pressing the Lock Next Target or Lock Previous Target keys or by pressing the Lock Target on Nose key. The Lock Next Target locks the closest target to you that's within the radar cone. As you continue to press it, it locks on the next target (further away) and so on. Lock Previous Target works in the opposite way from Lock Next Target. While Lock Next Target goes from the current target to targets furthest away, Lock Previous target moves from the current target to the next closest target and so on. Lock Target on Nose will try to lock up any target that is directly in front of you.

You can also lock up any arbitrary target directly by moving the cursor bars directly over the target on the radar display and pressing the Designate Target key. Press the Radar Return to Search key (period on the numeric keypad) to break the lock.

Unlocked radar returns appear as small squares. A locked target appears as a triangle with a leader line surrounded by a circle. The leader line indicates the relative aspect of the aircraft you've locked up and its length is proportional to its speed. A number representing the aircraft's altitude (in thousands of feet) appears under the circle. This is the aircraft's altitude above ground level, not relative to you as it was in the Easy radar mode.

The cursor bars have two numbers associated with them, indicating the upper and lower altitude range the radar can scan. These numbers will vary according to your altitude and pitch.

When a target is locked additional readouts appear around the edge of the display in Simplified mode. From the top left moving clockwise, they are:

ASPECT ANGLE

This indicates the aspect angle of the locked aircraft. Use this value to determine if he has his nose on you or not. An aspect of 180 degrees indicates his nose is pointed directly toward you. An aspect of 0 degrees shows his nose is pointed in the same direction yours is. Aspect values are given as left or right aspects because his nose may be pointed to your left or right by a certain angle.

HEADING

This readout shows the heading of the locked target.

SPEED

This readout shows the computed air speed of the locked target in knots.

CLOSURE

This readout shows the closure rate of the locked aircraft in feet per second. Closure is positive (if you're gaining on him) or negative (if he's pulling away)

BULLSEYE

This readout isn't used in the *Falcon 4.0* demo.

RANGE SCALE

The current radar range is found between an up and down arrow.

ANTENNA MARKERS

You'll see an inverted T marker along the bottom and the left edge of the radar. These markers indicate the horizontal and vertical position of the radar as it tracks a target. You need to be aware of the maximum limits of these directions because if the radar exceeds its gimbals limits, it will drop lock on the currently locked target. Don't let the markers move to either end of their range (top or bottom edge for the vertical marker and left or right edge for the horizontal marker). Instead, move the nose of your aircraft so that the target is back in the center of the radar.

Air-to-ground radar modes

When you switch to air-to-ground radar modes, you will get a slightly different display, but the operations will be the same as with the air-to-air radar modes. There are three air-to-ground radar modes in Realistic avionics: Ground Mode (GM), Ground Mode Tracking (GMT) and SEA. Easy and Simplified avionics have only one radar mode, Ground Mode Tracking.

GM is used to locate fixed targets on the ground. GMT is used to locate targets that are moving, such as trucks and tanks. SEA is used to locate targets on the ocean. Cycle through the air-to-ground radar modes by pressing the F2 key.

Use the Lock Next Target (>) or Lock Previous Target (<) keys to lock up targets (enemy targets will displayed in red). Or you can use the cursor keys to position the cursor over a target of interest and press Designate Target (0 on the numeric keypad).

Realistic Mode

simulates the radar modes in the F-16. This is the most accurate rendition of the APG-flight simulator that's available. This mode actually works in this demo version, but *con 4.0* to get the detailed documentation that tells you how to take advantage of this modes.

Gameplay Hints and Tips

Q: How do I get my joystick to work with the *Falcon 4.0* demo?

A: Your must first calibrate your joystick in Windows 95 before starting the game. Double-click the " Game Controllers" control panel. Click the " Add" button to view the list of possible joysticks. The *Falcon 4.0* demo will not correctly detect your ThrustMaster or similar joystick unless you choose their generic equivalent from the joystick selection screen. For example, select " 3-axis, 2 button joystick" if you have a throttle or " 2-axis, 2 button joystick" if you do not have a throttle. Otherwise, the *Falcon 4.0* demo will not properly assign the correct buttons to your joystick. Click the " Properties" and then " Calibrate" buttons to calibrate your joystick. You can test your joystick' s range of motion and buttons by clicking the " Test" tab.

Q: I want to just jump right in and start shooting things. What do I need to know to fly and fight?

A: The main thing to remember when flying to make sure that you never lose too much airspeed. Always keep an eye on your throttle and airspeed indicator, especially when making sharp turns.

To fire at enemy planes, just press joystick button 1 to fire your 20mm Vulcan cannon. To use your air-to-air missiles, press " C" to switch to Dogfight mode and you will be armed with AIM-9P missiles (short-range infrared missiles). Press " V" to switch to MRM mode and you will be armed with AIM-120 missiles (medium-range radar missiles). When an acquired target has both a circle and a diamond around it on your HUD, press joystick button 2 to fire your missile.

Be sure to calibrate your joystick from within *Falcon 4.0* once you start the demo. Click the " Setup" button on the left-hand side to configure your joystick. Click the " Controllers" tab and then the " Calibrate" button. Follow the directions onscreen. You also test your joystick buttons.

Q: What weapons does *Falcon 4.0* have?

A: Although the final *Falcon 4.0* game will have a wider selection of weapons, you should find the six weapons in this demo more than sufficient. You can use your 20mm Vulcan cannon or 2.75-inch FFAR rockets. For targets in the air, you can fire AIM-9Ps or AIM-120s. For taking out ground targets, use the Mk82 bombs or the AGM-65 Mavericks.

Q: What are the different radar modes and how do they work?

A: To change your radar type (avionics), click the Setup icon at the main menu. You can select from three different avionics settings: Easy, Simplified or Realistic. In Easy mode, the radar gives you a god' s-eye view of the world from overhead in which all other objects are positioned relative to you. In Simplified mode, the radar covers a cone-shaped area in front of you and all other objects are identified based on range and bearing. The Realistic mode is based on the real F-16 and its AN/APG-68 radar. It' s too complex to explain here.

Just remember that pressing " C" will put you in Dogfight mode with AIM-9P missiles and pressing " /" (slash) will lock whichever target is directly ahead of you.

Q: How do I shoot down an air target?

A: First, change to air-to-air mode. You can press " C" or " V" to go straight to your missiles. Or you can press the Enter key to cycle through your air-to-air weapons. When you acquire a target, a circle will appear around that target. Press " /" (slash) to acquire a target directly in front of you. When a diamond appears within the target circle, you' ve got a good lock on that target. If you look at the bottom right of your HUD, you will see a range readout that displays how far the target is in miles. If you get close enough to the target, the circle around the target will start to disappear going counterclockwise from the top. Guns are usually good within one-half of a mile. If your target gets behind you or shakes you off, press " 4" to bring up the Extended FOV. This view displays a small inset picture at the bottom of the screen as well an arrow indicating which direction you should fly in order to get back on the enemy' s tail.

Q: I' ve just been locked on and I hear missiles being launched at me. What should I do?

A: Your best bet is to line yourself up at a 90-degree angle away from the approaching missile to try to break the missile lock. Don' t forget to drop chaff and flares as the missile approaches.

Q: When do I use chaff vs. flares?

A: Chaff packets are used when a radar-guided missile is locked onto you. Flares work against heat-guided missiles. However, rather than worrying about which type of missile is trying to destroy you, we advise that you drop both chaff and flares liberally to survive.

Q: How do I drop bombs?

A: To drop Mk82 (iron) bombs, press the Backspace key once and you should see " CCIP" for Continuously Computed Impact Point appear in the lower left corner of your HUD. You will see a straight line from the top of the HUD that goes to the ground with a circle at the end. This circle (pipper) represents the bomb' s impact area when it is released. If a short horizontal line appears on the main line, this means that the bomb would impact the ground under your nose and, therefore, you won' t be able to immediately release the bomb. You should try to be at around 400 knots at about 4,000 feet for your approach and diving at your target at 15 degrees or more. When the horizontal line goes away, press joystick button 2 to drop your bombs. After you release the Mk82s, press " P" to pause the game, switch to an external view, unpause the game and then watch the explosions from overhead. Don' t forget to pull up while sightseeing!

Q: How do I land my F-16?

A: Well, the first step is to find a runway. With your radar in HSD mode, you should see the steerpoints that lead to your air bases (and, therefore, runways). Press the " N" key to change to your next steerpoint. When you

find an air base, make sure your airspeed is below 300 knots and then lower your landing gear. Press " B" to use your speed brakes and lose some airspeed. If you press " 5" for Chase View, you should be able to verify that your speed brakes are open. You should be at about 160 to 180 knots during your final approach. If you manage to touch the ground without crashing, press " W" to set the wheel brakes and your plane will come to a complete stop. Note that in this demo, completely stopping on a runway will end your Instant Action game.

Q: How do I turn off the radio calls?
A: Just select from various sound options in the Setup area on the main menu.
Q: How do I handle air-to-air refueling?
A: One of the ultimate challenges in flying an F-16, midair refueling requires a lot of skill and experience. First, you need to find a KC-10 tanker. Press " C" to acquire the KC-10…but don' t shoot it! Pull within one nautical mile of the tanker, press Shift-S and choose option 1 on the Tanker Command menu. Once you' re cleared for pre-contact, proceed toward the KC-10 until you hear " Clear to contact." Press Shift-S again and select option 2. When you reach the boom, try to move under the KC-10 and the boom should start moving toward you. Once the refueling is completed, press Shift-S and selection option 3 to complete refueling.
Q: It doesn' t appear as if the flight characteristics of the various aircraft and missiles are entirely accurate.
A: Please remember that this is a preliminary demo version of *Falcon 4.0*. We are continuing to fine-tune the simulation before we release it.

Demo Keyboard Commands

Simulation keys

+ (plus)	Increase thrust
- (minus)	Decrease thrust
Shift-Minus	Full afterburner
W	Wheel brakes
Ctrl-E	Eject
A	Autopilot
G	Gear
H	Toggle pitch ladder
Ctrl-H	Toggle HUD scales from analog to digital
Alt-H	Change HUD color
Z	Flares
X	Chaff
B	Toggle speed brakes
Shift-B	Open speed brakes
Ctrl-B	Close speed brakes
N	Set previous steerpoint
M	Set next steerpoint

Weapon keys

Backspace	Cycle air-to-ground weapons
\ (backslash)	Fire control computer submodes
Shift-\	Fire control computer master modes

Enter	Cycle air-to-air weapons
D	Cancel missile mode
Alt-J	Jettison selected weapon
D	Toggle Dogfight mode
V	Toggle MRM mode
Spacebar	Fire weapon

MFD (Multifunction Display) keys

[	Cycle left MFD
]	Cycle right MFD
Shift-[	Display upper left MFD
Shift-]	Display upper right MFD
Ctrl-[	Display lower left MFD
Ctrl-]	Display lower right MFD
’ (apostrophe)	Toggle SMS (Stores Management System) page or EO (Electro-Optical) for Maverick

Radar Keys

F1	Cycle radar air-to-air modes
F2	Cycle radar air-to-ground modes
F3	Decrease radar range
Shift-F3	Decrease radar gain
F4	Increase radar range
Shift-F4	Increase radar gain
F5	Tilt radar antenna down
F6	Center radar antenna
F7	Tilt radar antenna up
F8	Cycle radar submodes
Shift-F8	Change radar bar scans
F9	Ground Map radar field of view
<	Lock previous target in Easy and Simplified radar modes
. (period)	Lock next target in Easy and Simplified radar modes
/	Lock target on nose in Easy and Simplified radar modes
Up arrow	Move cursor up
Left arrow	Move cursor left

Down arrow	Move cursor down
Right arrow	Move cursor right
0 on numeric keypad	Designate target
. on numeric keypad	Radar return to search

View Keys

` (accent)	No cockpit view
1 on top row	Front cockpit view
2 on top row	Virtual cockpit view
3 on top row	Padlock view
4 on top row	Extended FOV (field of view) view
5 on top row	Chase view
6 on top row	External view
Y	Toggle narrow FOV
U	Lower left cockpit
I	Lower cockpit
O	Lower right cockpit
Insert	10 o' clock view
Home	50/50 view
Shift-Home	HUD view
PageUp	2 o' clock view
Delete	9 o' clock view
End	4 o' clock view
Shift-End	8 o' clock view
PageDown	3 o' clock view
7 on numeric keypad	Zoom out
1 on numeric keypad	Zoom in
8 on numeric keypad	Pan view up
4 on numeric keypad	Pan view left
6 on numeric keypad	Pan view right
2 on numeric keypad	Pan view down
+ on numeric keypad	Track previous plane
- on numeric keypad	Track next plane

3 on numeric keypad	Glance backward
Enter on numeric keypad	Glance forward

Command keys

Shift-Q	AWACS command
Shift-S	Tanker command

Miscellaneous Keys

PrintScrn	Screen shot
P	Pause
Ctrl-L	Toggle labels

The *Falcon 4.0* demo keys are also available in a key chart called F4DEMOKEYS.PDF. This file can be opened with Adobe Acrobat Reader version 3.0, which can be downloaded from Adobe's Web site.

Troubleshooting

Q: When I try to run the 3Dfx version of the *Falcon 4.0* demo, the game crashes when I start Instant Action.

A: First, try running the non-3Dfx version of the *Falcon 4.0* demo just to make sure the demo works correctly. If it does, then you may need to update your Direct3D and Glide drivers for your Voodoo 3Dfx card. Please follow the instructions in the README.TXT file in the 3DfxD3D folder in your *Falcon 4.0* demo directory.

Q: When I run the *Falcon 4.0* demo, the palette is wrong and everything looks neon-colored.

A: If you do not have a Voodoo 3Dfx card and you turned on "Texture Smoothing," you may see this problem. We recommend that you do not turn on "Texture Smoothing" unless you have a 3Dfx card because the game will also run significantly slower.

Q: How can I improve the frame rate in the *Falcon 4.0* demo?

A: We plan to optimize the code for the final version of *Falcon 4.0.* However, we recommend turning off "Texture Smoothing" and "Transparency" in the Graphics setup if you do not have a Voodoo 3Dfx card. In addition, turning down terrain detail and turning off labels will help improve the frame rate. Another option is to turn Terrain Texturing lower (or even off).

Q: How do I update to version 5.0 of DirectX?

A: Please insert your *Falcon 4.0* demo disc into your CD-ROM drive. Open the DirectX5 folder, then open the DirectX folder. Double-click the DXSETUP.EXE file to install version 5.0 of DirectX.

Q: I installed the Compact version of the *Falcon 4.0* demo, and I am having some pauses or stuttering when I play the demo.

A: We are still working on optimizing *Falcon 4.0* to run smoothly from a CD-ROM. However, for the demo, we recommend installing the Complete version (which takes 51MB) in order to minimize these problems.

Q: I have a ThrustMaster FCLS and TQS. How do I set up the *Falcon 4.0* demo to work with my game controllers?

A: Before loading the *Falcon 4.0* demo, open up the *Falcon 4.0* demo folder. Double-click the TM folder and then the TM.BAT file to load the B50 file for the *Falcon 4.0* demo. Then start the game demo and your ThrustMaster equipment should work correctly.

Q: I have a CH F-16 Combat Stick or a CH Jane's Combat Stick. How do I get my CH joystick to work with the *Falcon 4.0* demo?

A: First, you need a CH utility called Speedkeys version 1.6b. You can download Speedkeys from the CH Web site at www.chproducts.com. Then, install Speedkeys by running the Setup program. Next, copy the CHFALCON4.PTW from the CH directory in your *Falcon 4.0* demo directory to the CH Products directory. Run Speedkeys and select CHFALCON4.PTW from the list of game choices. Click the "Download" button to download the joystick setup for *Falcon 4.0.*

Q: I have a non-Intel CPU (such as older Cyrix and AMD chips) and the *Falcon 4.0* demo does not run smoothly or at all.

A: Unfortunately, *Falcon 4.0* makes intensive use of floating point arithmetic. Therefore, some "586" CPUs that do not include a floating point processor will run *Falcon 4.0* significantly slower or not at all.

Q: I don't have a Voodoo 3Dfx video accelerator. Does *Falcon 4.0* support Direct3D?

A: Unfortunately, the *Falcon 4.0* demo does not include support for Direct3D. However, we will include Direct3D support in the final game.

Q: Does *Falcon 4.0* work on a Windows 3.1 or Windows NT system?

A:	Unfortunately, *Falcon 4.0* requires Windows 95 and DirectX version 5.0. This makes it incompatible with both Windows 3.1 and Windows NT.

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