FALCON 4.0

ALLIED FORCE

Basic Operations Manual

LEAD PURSUIT

graphsim entertainment

Falcon 4.0: Allied Force
Basic Operations Manual

Contents:

Chapter 1: Introduction

"There's a huge war going on, and someone has put you in charge of an F-16."
That's Falcon 4.0: Allied Force in a nutshell. It is the most advanced and immersive
military flight simulator ever produced for the home PC. This game builds upon the
legendary reputation of the Falcon series of simulations to give the closest feeling
yet of what it is like to fly one of the most important combat aircraft of modern
times.
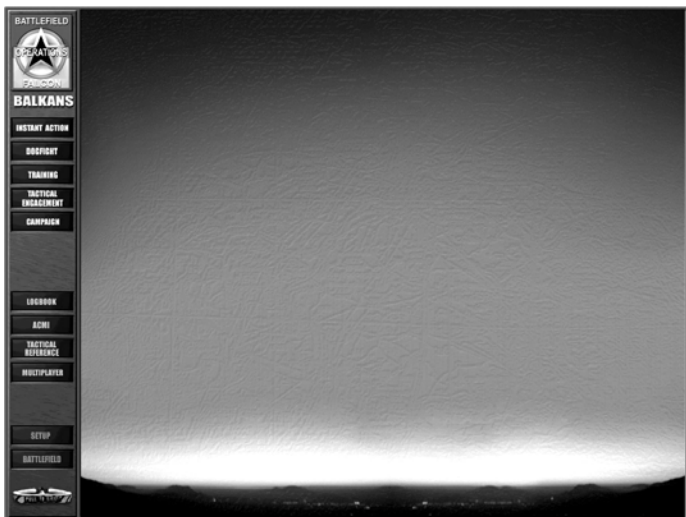
The F-16 Fighting Falcon, also known as the "Viper", is the workhorse of the
United States Air Force and many of her allies around the world. To date, more
than 4,000 F-16s have rolled off the production line in various guises. Its combat
duty spans both Gulf conflicts and the war in the Balkans.

In this simulation, you'll learn to fly realistic air and ground attack missions, and
feel part of a dynamic real-time war environment. This manual will guide you
through the basics of operating the aircraft. Not only will you become proficient
inside the cockpit, but you will also gain an understanding of the way weapons
systems operate in the war, and understand the complexities of fighting in a modern
high-tech battlefield.

Chapter 2: Main Menu

There are five main ways to play:

Instant Action

This is your first port of call if you are looking for an adrenaline rush. Jump straight into a jet already in the air and shoot down as many enemy aircraft as you can. You can also attack ground targets in the same arena.

Dogfight

Battle it out head-to-head against computer-controlled aircraft or your friends over the Internet or in a LAN. Fly in teams to practice in-flight coordination and maneuvers against the enemy. There are a number of easily selected parameters so you can focus on the skills you want to hone, either alone or as a member of a team.

Training

Training consists of thirty missions to help get you up to speed with the complexities and challenges of flying the F-16. From take-off to missile threat avoidance, these missions help prepare you for combat in the virtual battlefield.

Tactical Engagement

Create your own missions or fly missions created by others. The game comes with a complete and easy to use mission editor. Design and fly any type of mission; be it Close Air Support, Intercept, or one of a dozen other mission types. Then add any type of enemy you want. You can import custom missions from your friends to modify and fly.

Campaign

This is the most demanding yet rewarding method of play. You assume the role of a veteran F-16 pilot assigned to a squadron that is taking part in a conflict in either the Balkans or Korea. Your success or failure to accomplish your missions directly impacts the progress of a simulated war. The game controls tens of thousands of enemy and friendly units: land, sea, and air. Watch how the campaign evolves dynamically and in real-time. The campaign is unscripted, unpredictable and unmatched in its realistic depiction of a dynamic battlefield environment -- no two missions are ever the same.

You can choose to fly one of three variants of the F-16: Block 50/52; Block 40/42; and "Mid-Life-Upgrade" (MLU) series. The depth of the simulation is immense. The more you learn, the more you begin to appreciate the amount of training and skill required by those pilots who do it "for real".

There are several "tools" in the simulation that can help you assess your progress and debrief your missions.

Logbook

Details about your pilot character, such as callsign, are contained in this section. Here you can keep track of the number of aircraft that you have shot down and the number of enemy units destroyed. Medals and ranks are awarded according to a points system. You can simultaneously keep track of multiple pilots in your logbook.

ACMI (Air Combat Maneuvering Instrumentation)

One of the most useful tools for a fighter pilot is ACMI. By keeping track of the position of your aircraft and others, you can replay your mission to better understand what went right and what went wrong. Using simple movie-style controls you can move back and forth in time during your mission and watch a replay from a variety of viewpoints. You can analyze the way you successfully evaded an SA-2 or see how those two SU-27 Flankers got onto your tail.

Tactical Reference

The Tactical Reference is a comprehensive reference guide for every aircraft, weapon and unit in the game. Here you can find out the radar warning signature of a MiG 29 for example, or the approximate range of a surface-to-air missile.

Multiplayer

Fly with your friends either over the internet or on a LAN, with the choice of Dogfight, Tactical Engagement or with the Campaign mode.

The main User Interface (UI) is also the place where you can change the settings and preferences for the simulation.

Setup

Here you can modify simulation-specific settings, alter graphics and sound to your needs and change key mappings.

Battlefield

Finally, this button gets you to the Battlefield selection screen where you can choose from the Balkans and Korean theater, each set in 3 different periods of time, giving you a total of 18 campaigns in 2 theaters to enjoy.

Quit

Click the "Pull to eject" to quit the game.

Chapter 3: Cockpit Instruments

To fly the F-16, you need to know a few basics about the instruments. This cockpit depicted in the game not only looks exactly like the real F-16 cockpit, but also features the same functionality.

The HUD

The HUD, or Head-Up Display, uses a projector and a series of lenses to deliver real-time information about target location, navigation and weapons systems through virtual imagery within the pilot's line of sight.
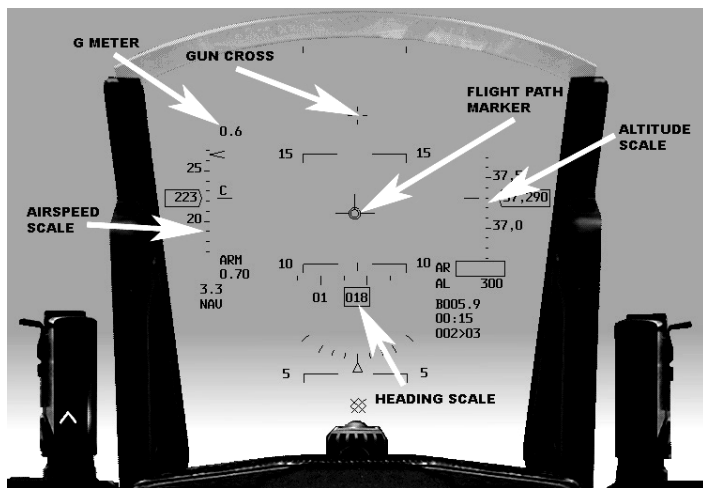
Figure 3-1

Main HUD Components

● The flight path marker (FPM), the small aircraft like silhouette, is the most important indicator on the HUD. This symbol shows the aircraft's direction of travel. The flight path marker can be used to fly to an exact touchdown point on a runway. You can achieve level flight or precise-angle climbs or dives using nothing more than the flight path marker.

● The gun cross is the small cross symbol at the top of the HUD. This is an important reference since it represents where the nose of the aircraft (and thus the

gun) is pointing. The angular difference between this mark and the FPM is called the AOA (Angle Of Attack.) In level flight it is normal for FPM to be below gun cross, which represents the positive AOA needed by the wings to generate necessary lift.

● The pitch ladder provides a level flight reference along with a reference for climbs and descents. The long solid horizontal line in the middle of the HUD is the 0° pitch line which indicates the horizon. It can be easily differentiated from the other pitch ladder lines because it has no number associated and is a bit wider than the climb and descent rungs. The dashed pitch ladder lines show descents in 5° increments while the solid lines show climbs.

● The airspeed scale (on the left side of the HUD) displays airspeed in knots. It can show calibrated airspeed, true airspeed or ground speed.

● The altitude scale is on the right side of the HUD. The data is derived from either barometric pressure indicating altitude above mean sea level (MSL), or from special downward-facing radar that determines height above the ground (AGL). Barometric altitude is indicated by a "B" to the left of the altitude and radar altitude by "R". The "B" also appears when the radar altimeter is switched off, or when your jet is not reasonably parallel to the ground. Above 1,200 feet AGL, the number indicated is thousands of feet. For example, if the scale shows "20", then the aircraft is 20,000 feet above sea level. When you get "down in the weeds" (below 1,200 feet AGL) the altimeter changes scale to hundreds of feet. So if the number indicated is "2," then you are 200 feet above the ground. Keep in mind that this number is the ground directly underneath your jet and not the ground that is in front of you. As you climb and get above 1,500 feet, the scale goes back to MSL.

● The heading scale at the bottom of the HUD shows aircraft heading. So "018" in the box indicates a heading of 18 degrees on a compass scale, where 0 degrees corresponds to north.

● The HUD G meter located in the top left corner of the HUD shows current G force (one G is the acceleration due to Earth's gravity) acting on the jet, whereas the G meter (located at the bottom left corner of the HUD just above the 'NAV' symbol) shows the maximum G force you have pulled so far during a given flight.

HUD Control Options

Figure 3-1 shows all the various indicators on the HUD display called up, which is the way you normally fly in both the game and the real F-16. Not all fighter pilots use the HUD the same way. You can configure your HUD display to suit your needs just as the real pilots do.

There are several key presses to individually customize the appearance of the HUD elements. So for example, press "SHIFT CTRL ALT S" to change the appearance of the Heading Scales, press "SHIFT CTRL ALT P" to change the appearance of

the Pitch Ladder. Further switches can be found in the Control section of the setup user interface or check the PDF manual on the CD-ROM.

Other HUD symbols, like diamonds and timing cues, are discussed in the training missions section of this manual.
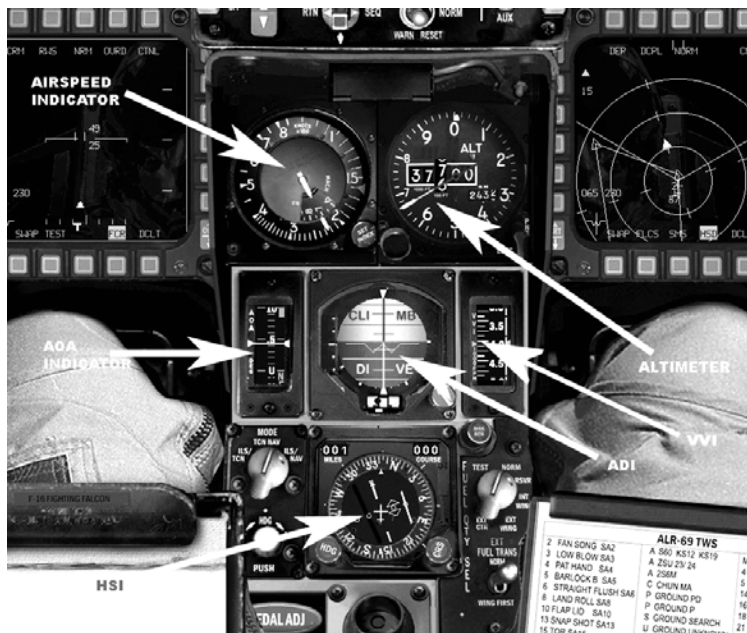
Figure 3-2

Instruments

At first sight, it looks quite overwhelming. But as you become familiar with your F-16, the cockpit instruments will become second nature. Let's examine some of the main instruments that show how the aircraft is flying.

The ADI (Attitude Director Indicator) provides an artificial horizon and an aircraft symbol so you can tell the attitude or orientation of the aircraft relative to the earth. The airspeed indicator shows the aircraft's airspeed in hundreds of knots. When the outside needle is on the "4," you are going 400 knots. The inside needle shows current Mach number, which is your speed relative to the speed of sound. In this figure, the number indicated is slightly above Mach 0.7.

The altimeter shows the MSL altitude (altitude above mean sea level) of the aircraft on the round dial. The digital readout on the inside of the dial shows the altitude in feet. The white needle on the dial displays the hundreds of feet of the current altitude. For example, when your aircraft is between 10,000 and 11,000 feet and the needle positioned on the "8", you are at 10,800 feet altitude MSL.

The AOA indicator is a tape that shows the angle of attack of the aircraft. To generate lift, the jet needs to have a positive angle of attack (a positive angle relative to airflow.) The F-16 can fly with an AOA between +25° and -5° degrees. Remember that the AOA is the angular difference between the gun cross and the flight path marker.

The VVI (Vertical Velocity Indicator) shows the aircraft's current rate of climb or descent in thousands of feet per minute. The scale has two parts: the white indicator shows values for climbing, and the black shows values for descent. The range of values the VVI can display are within +6000 and -6000 feet per minute.

The HSI (Horizontal Situation Indicator) is a very complex gauge, but primarily tells you the direction your aircraft is heading. The round moving dial on the HSI shows N/S/E/W for north, south, east and west. When the aircraft turns, the dial moves to indicate the change in aircraft heading. HSI is showing other markers as well.

The RPM gauge shows the revolutions per minute of the turbine blades at the core of the engine. RPM is shown as a percentage, with 100% representing the fastest the engine can go and 0% meaning the engine is stopped. Engine idle is 70% power. RPM is directly tied to throttle position, which controls how much thrust the engine produces.

Figure 3-3

Chapter 4: HSD

Horizontal Situation Display

Figure 4-1

Imagine an instrument which presents you with a "God's Eye" view of your aircraft during a mission, showing you the route you should take, the steer points you must reach, the position of your wingmen and even details about what enemy aircraft

they might be engaging. That instrument in the F-16 is the Horizontal Situation Display (HSD).Figure 4-1 shows a simple HSD in action.

Details

The HSD is activated automatically by turning on the radar or by cycling through the screens with the "]" key. Your position is indicated by the simple cyan-colored symbol in the center of the display.

Figure 4-2

Now refer to Figure 4-2. Your route is represented by a series of white lines, which typically trace a complete path from start to target and back home. You'll notice that there are various symbols linking the route lines together. These are called Steer points (STP) and are discussed in more detail later.

The three circles fanning out from the aircraft icon indicate distance from the aircraft. You can adjust the range of the HSD by clicking, with your mouse, the buttons immediately to the left of the "60" figure. The top button increases range, the bottom decreases. In the figure, the range is 60 NM. Therefore, the smallest circle represents 20 NM, the middle circle 40 NM and the largest circle 60 NM.

The cyan-colored zone above your aircraft symbol represents the current scan volume of the aircraft's radar. In the figure it is set to 40 NM. Just ahead of the radar zone on the display, the steer points (STP) are marked on the route. These points are used for navigation, guiding the pilot to a target. The first steer points are numbered starting with your take-off airbase. You can select the next STP with "S", and the previous with "SHIFT S". The critical steer points for any mission are represented by the box and triangle shaped symbols. These represent the "ingress" point and "target" points respectively. The ingress point is start point of the attack run, where you and your flight should be fully prepared for executing whatever attack has been assigned. The target point is where the target is located (or rather believed to be located: intelligence isn't always correct).

Figure 4-3

Other Flight Aircraft Information

Okay, we've covered the basics: now to find out about how to use the HSD to determine the position of the rest of your flight in the air.

Figure 4-3 shows an HSD display after pressing "DEP" on the top left to centralize our aircraft in the middle of the display. Range has also been decreased. And highlighted inside the circle is the direction of North, which, of course, is rather useful.

This HSD shows your aircraft and three others, making up a "four-ship". Each aircraft is depicted by a semi-circle icon with a protruding line and a number above; "2" (your wingman), "3" (element lead) or "4". The protruding line indicates the aircraft's direction of travel. In this case the wingman ("2") is following a similar bearing to "3", whereas "4" is heading slightly more to the right from our perspective. The numbers below each icon indicate the aircrafts altitude in thousands of feet. We can see here they're all flying at 23,000 feet.

Locking Up Targets

Figure 4-4

Now for some advanced uses of the HSD. It is recommended you first familiarize yourself with the workings of Air-to-Air radar by reading **Chapter 5: Radar**. How can the HSD help us when engaging air to air targets? Well, in certain modes it can

show a target and provide information about the target's direction of travel. Consider a simple engagement between one F-16 and one Mig-29. Both aircraft are following flight paths in which they meet head-on, what's known as a "high aspect encounter." Figure 4-4 shows a target locked in RWSSAM mode.

Figure 4-5 shows the same target locked up one stage beyond RWS-SAM, using Single Target Track (STT).

This display is very similar, except that we now have a "radar volume line" reinforcing the switch to STT. The HSD can also relay information about what your flight's aircraft are targeting.

In this next scenario (Figure 4-6), we have two F-16s going head to head with two Mig-29 aircraft. Our wingman is fairly close by, so does not register particularly well on the HSD. The primary F-16 has not locked up a target. What we see is what our wingman has locked up, denoted by the "2". The target's height is given as the lower number again, here at 31,000 feet.

Figure 4-5

Understanding the Bulls-eye

A final point on the HSD is the concept of "bulls-eye" positioning. See Figure 4-7.

The bulls-eye is an imaginary location in the theatre of war. It is a reference point from which the relative position of an aircraft, a ground unit or any other target can be determined. So why use a reference point rather than GPS coordinates for targets? The answer is simple: since the bulls-eye location is communicated prior to takeoff, the position it represents can be kept secret. GPS coordinates, if intercepted by the enemy, would give away target positions.
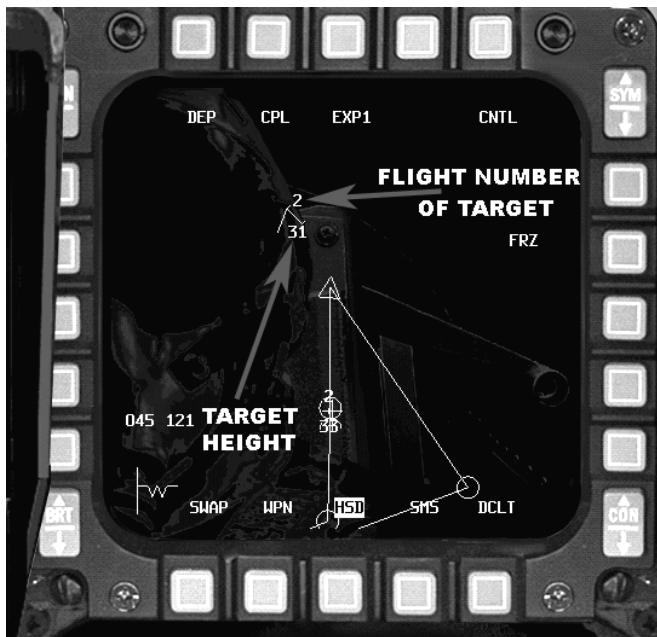
Figure 4-6

The distance and bearing of the cursors from the bulls-eye are displayed. In Figure 4-7, we can see a reading of "196 for 17". This means that the cursors are at a bearing of 196 degrees from the bulls-eye, and 17 NM distance from the bulls-eye. Those numbers change as the cursor is moved around the HSD or the A-A radar screen with the UP, DOWN, LEFT and RIGHT keys.
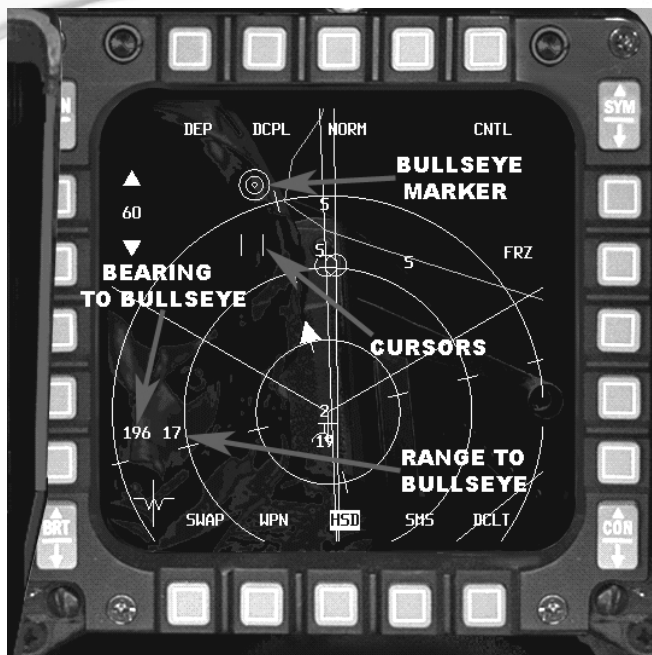
Figure 4-7

Chapter 5: Radar

Radar is the single most important sensor on a fighter aircraft. It shows the pilot what is in the air and what is on the ground. Without it, the pilot is blind. Radar is used to detect and attack targets. Far from exhaustive, this chapter gives the basics so that you can operate the aircraft successfully without a lot of reading. For more detailed information please refer to the full manual on the CD-ROM.

Radar works by emitting a pulse of electromagnetic radiation, then detecting reflected (returned) radiation. These returns are analyzed and a tremendous amount of information can be gleaned about what they bounced back from. For example, specific return patterns can identify the aircraft type. They can determine its height, its speed, even the direction in which it travels. And the radar does all of this continuously, as it happens, when it happens.
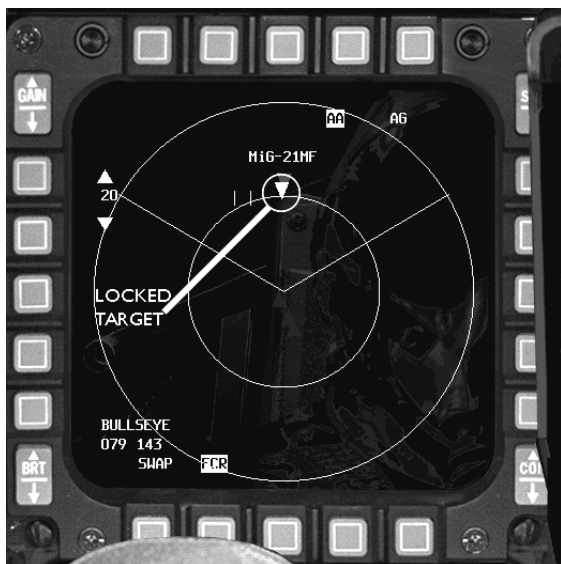
Figure 5-1

The radar modeled in *Falcon 4.0: Allied Force* is based upon the AN/APG-68 as used in the F-16. The radar results are processed by an on-board computer, and the results are displayed on the Multi-Functional Display (MFD) and the HUD. You

can select air-to-air radar by pressing the "RETURN" key or by selecting the "A-A" button on the ICP panel, beneath the HUD.

"Simplified" Radar Mode

For the new pilot, the best option to select is "Simplified" under the "Avionics" tab of "Simulation" in the set up screen. This setting gives a 360 degree area of coverage around the F-16. It doesn't work like this on the real F-16, but the simplified presentation provides the basic information to tell the new player what's around their aircraft. Figure 5-1 is a typical display.

The important concept to understand here is that you are looking down at a diagrammatic representation of your aircraft in flight. Your plane is positioned in the middle of the display. Other aircraft around you are shown as colored triangles: blue for "friendlies" and red for "enemies". In this example, we have a group of two enemy planes ahead of us and three enemy planes behind us. In Real Life the job of discerning the "good guys" from the "bad guys" is a lot more involved, but "simplified" avionics sorts this out for you straight away. The range of the radar can be adjusted either up or down to see aircraft returns further out or closer in. Here we have 20 nautical miles (NM) selected. Decrease range by pressing "F3" and increase range by pressing "F4".

Figure 5-2

Simplified radar also lets you see on the screen missiles fired by enemy aircraft at you. These are shown as red lines coming form the target. These red lines can also curve to show the direction of the path of the missile. See Figure 5-2.

So how do you "select" an enemy aircraft to fire a missile at? Simple: just press the target designate key (Page Down – Radar lock next target) and the nearest bandit is automatically locked up for you. This allows you to launch a missile at the attacking bandit. You'll notice too that the type of aircraft locked up is displayed

above the target icon. This will help you determine the level of threat of the bandit. (A Mig-21 is less deadly than an Su-27, for example.)

Once you're comfortable with simplified radar, it's time to try the advanced radar setting.

"Realistic" Radar Mode

Realistic radar can be selected by choosing "Realistic" avionics under "simulation" in the set up screen. Figure 5-3 shows a typical a-a radar scope display on the left hand MFD.
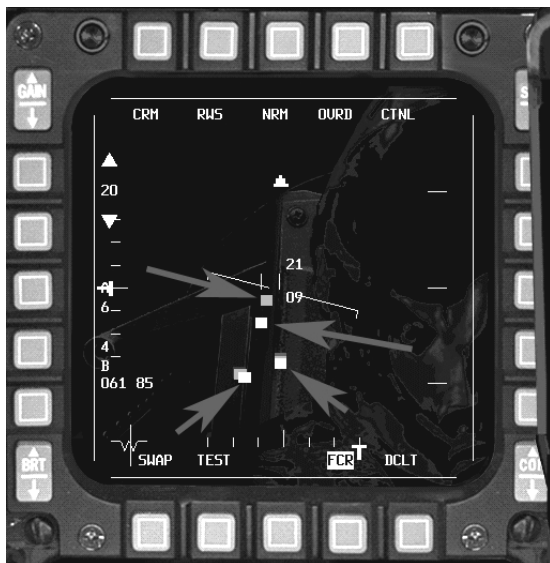
Figure 5-3

The large arrows (not part of the display) highlight yellow radar returns, which indicate aircraft flying in front of you. These aircraft can either be enemies or friendlies, and it's the pilot's job to separate the good guys from the bad guys. Each sweep of the radar, indicated by the blue-colored "T" moving back and forth along the bottom of the display, produces yellow boxes for each return. But you will notice that there are also pale yellow returns. These are target histories, and are ghosts which remain from the previous radar sweep. Notice the two vertical white lines, just above the returns. These are the radar cursors, which can be positioned

over a return to provide detailed information about it. The two values shown to the right of the cursors ("21" and "09") depict the current scan elevation envelope of the radar. Scan elevation is the vertical range of the radar sweep. In this example, at the current position of the radar cursor, only aircraft flying between 9000 and 21000 feet can be detected. If you want to scan for low-flying aircraft, you must move the scan elevation down. Do this by pressing the "F5" key. Press "F7" key to move the scan elevation up. To center the antenna elevation, press the "F6" key.
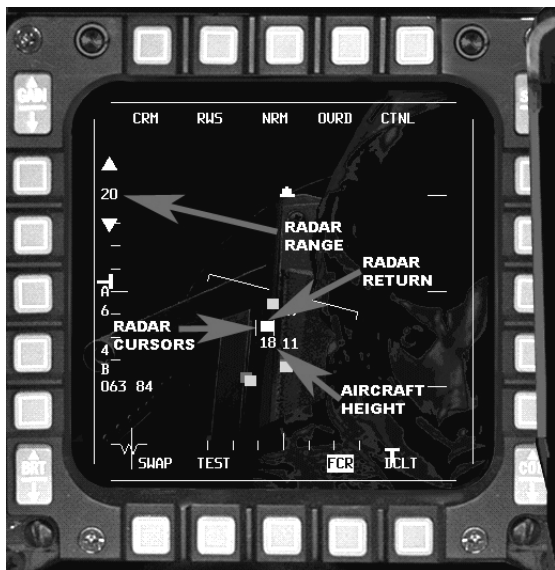
Figure 5-4

The radar display depicts returns from a top-down perspective, such that returns low on the display are near you, and returns higher in the display are further away. In Figure 5-4 we can see the radar range is set to 20 NM. This means that a radar return in the middle of the MFD would be at a distance of 10 NM, and a return at the top would be 20 NM away. At this setting, you can not see a radar return at the distance of 25 NM. Radar range can be changed by using the "F3" key to decrease range, and the "F4" key to increase range. Alternatively you can click the OSB buttons to the left of the radar range display to change the range. In this figure, the radar cursors are positioned over one of the returns. The "18" reading immediately beneath this return indicates that the target is at 18,000 feet, or "Angels 18".

Radar Modes

The radar can operate in one of several modes. This particular mode, Range While Scan (RWS) is the one used most often. Its maximum range is around 160 nautical miles, although it will not detect a target much further than 70 NM. The minimum range is 10 NM. So what happens when we select one of the returns? Position the radar cursors over one return, using the UP, DOWN, LEFT and RIGHT arrow keys, and then press "0" on the numeric pad. This puts the radar into the first sub-mode of RWS, called RWS-SAM (Range While Scan -- Situation Awareness Mode). See Figure 5-5.
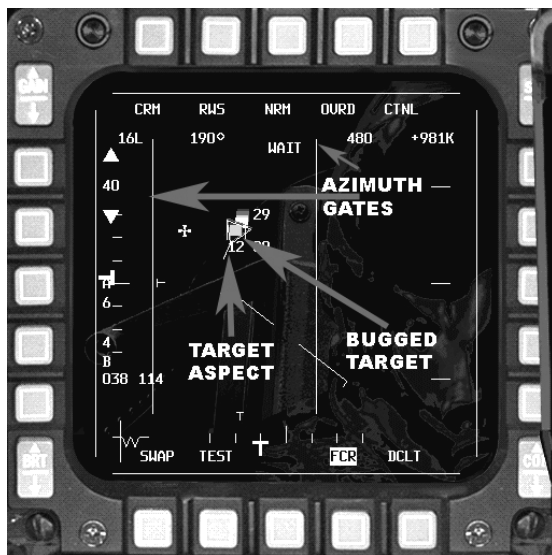
Figure 5-5

Here we see the bugged (selected) target, which has now lost its square shape and become a thin-lined triangle. The line emerging from the point of the triangle is the velocity vector, which indicates the speed (longer means faster) and direction of travel for the selected target. In this case, the target is in front of you and is heading to the left. Also in the scope are two vertical blue lines, the azimuth gates. These lines represent the new boundaries within which the radar is scanning. Notice the white "480 +981K" in the top right-hand corner of the display. This tells you the current speed and the rate of closure of the target, in this case 480 kts speed and 981

kts closure rate. If the figure were negative, it would mean that the target is pulling away from you.
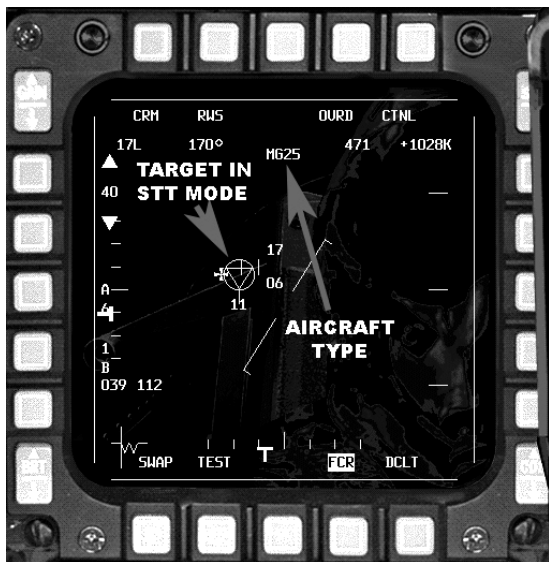
Figure 5-6

Let's go a bit further, and put the radar into a mode so that a missile can be fired at the target. At this stage we already have the target in RWS-SAM. Press "0" again and the radar will go into STT (Single Target Track) mode. In STT, the radar's concentrates on the one designated return, forsaking all others but producing a very high update rate. This is an ideal mode for launching the AIM-120 AMRAAM missile (more on this in the next chapter) because a target locked in STT is less likely to be dropped than a target in RWS-SAM mode. Figure 5-6 illustrates this mode.

STT mode is indicated by a circle surrounding the triangle symbol. All other radar returns are missing from the scope and the position of the new return updates rapidly on the screen. Additionally, the type of aircraft, if determined by onboard computers, is displayed at the top. Aircraft identification depends largely on target aspect. From this display in Figure 5-6, we see that a MiG-25 at 11,000 feet is headed towards us. These are just the basics of air-to-air radar. There are other radar modes modeled in *Falcon 4.0: Allied Force* which are explained in the full (PDF) manual. Experiment more for yourself by selecting Training Mission 13.

Chapter 6: Air-to-Air Weapons

A fundamental characteristic of a fighter aircraft is an ability to shoot down other aircraft. While the previous chapter examined the basics of air-to-air radar, we now concentrate on using the radar to deploy weapons against enemy aircraft. There are two types of A-A (air-to-air) missiles used by the F-16 in *Falcon 4.0: Allied Force*; The AIM-120 AMRAAM and the AIM-9 Sidewinder.

The AIM-120

If you want to take out a target that is beyond your visual range (BVR), the AIM-120 AMRAAM (Advanced Medium Range Air-to-Air Missile) is the weapon of choice. It is a supersonic missile capable of Mach 4 with a range of more than 30 miles, carrying 40 pounds of high explosive.

Figure 6-1

For the first part of its flight the AIM-120 uses returns from the host aircraft's radar to guide it towards the target. Once it gets close to the target, the missile's own onboard radar takes over. The steps required to deploy the AIM-120 are: detect the

target with the radar; select the target for the weapons system; launch the AIM-120 and follow procedures to ensure that it reaches the target.

Figure 6-1 shows a contact that has been locked up on a-a radar in STT (Single Target Track) mode. (Refer to Chapter 5: Radar.) The target is selected by pressing "0" twice. The "RETURN" key activates A-A mode, which displays the AMRAAM's range scale in the left hand MFD. If you cannot see the AMRAAM range scale, make sure you've activated the Weapons Master Arm switch.
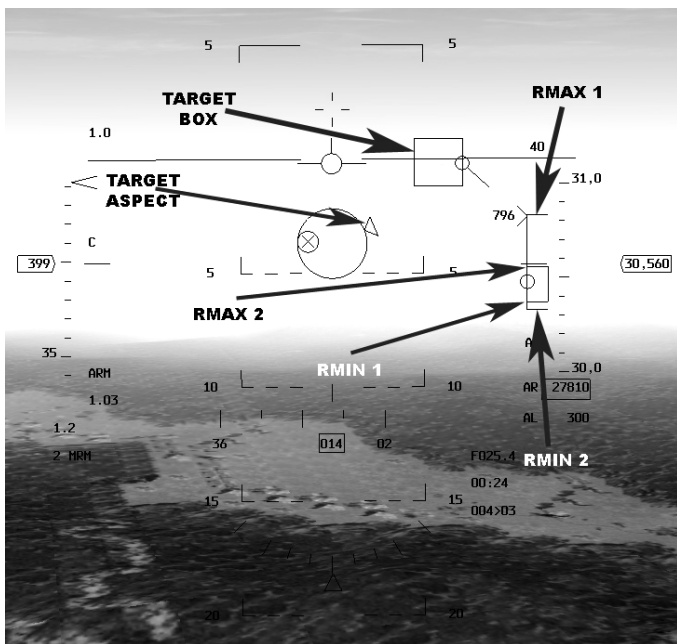
Figure 6-2

The HUD can also be used to launch an AIM-120. Figure 6-2 shows a view with the cockpit graphics removed, the so called "HUD-Only" view that you can reach by pressing the "1" key." The HUD data looks rather complicated, so let's examine the most important features:

TARGET BOX: Displays the position of the target in the HUD. In this example the target is too small to see at its current range, so the box provides the pilot with a visual position.

TARGET ASPECT or Velocity Vector: Indicates the direction of the selected target's travel.

RMAX 1: Is the maximum range at which the missile can reach the target. You can see that the range caret (the ">" symbol) is positioned at the uppermost end of this scale. This means that if the missile was fired, and the aircraft took no evasive maneuvers, the AMRAAM would just reach the target.

RMAX 2: Is the maximum range at which the missile would reach the target even if the target takes evasive maneuvers. Always consider this the absolute maximum range for a "jinking" bandit.

RMIN 1: Is the minimum range at which you can shoot the target. The closer the target, the more the missile has to maneuver to account for the bandit's change in direction.

RMIN 2: Is the base of the maneuver zone. This is considered a better gauge of minimum range for a maneuvering target.
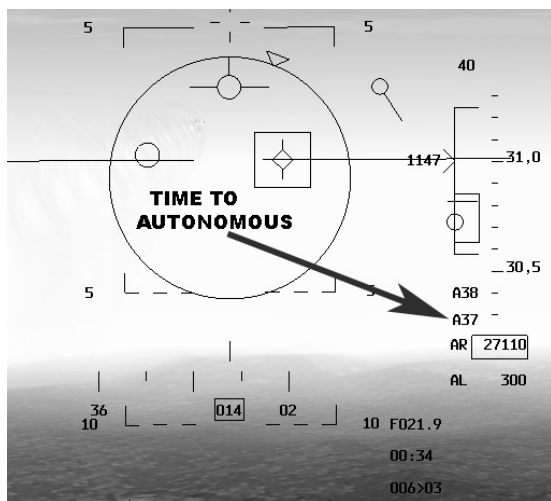
Figure 6-3

The best time to launch the missile is when its range is somewhere between RMIN 2 and RMAX 2. After pressing "SPACEBAR" to launch, there is a countdown in the HUD. See Figure 6-3.

Notice the "A37" figure. This means that the missile will go autonomous (self-guiding) in 37 seconds. When this timer reaches zero, the "A" will be replaced by a "T" and a new countdown time will begin. At this point the missile starts using its onboard radar, and the timer counts-down the time until impact. Notice also the "A38" in above "A37" in the figure. This shows the timing information for the next AMRAAM to be fired. When the first fired missile went autonomous and we locked up another target, the HUD in Figure 6-4 tells us the time for this next missile to go autonomous – 54 seconds.
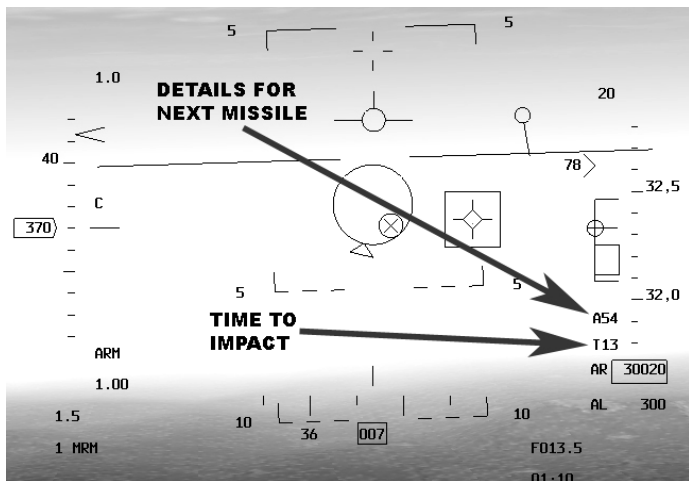
Figure 6-4

It is very likely that the target aircraft is itself carrying an electronic jamming system, designed to defeat attacking radar by transmitting "false-return" signals. The AMRAAM, however, can detect this jamming signal and use it to lock onto the target. And because it can use passive radiation for guidance, the AMRAAM can simply switch off its onboard radar. This is called "Home on Jam" and a "HOJ" symbol appears in the middle of the HUD when this occurs.

The AIM-9 "Sidewinder"
Not all confrontations with enemy aircraft take place beyond visual range. For encounters within visual range, the AIM-9 Sidewinder is the weapon of choice. Jet engines produce tremendous amounts of heat. The AIM-9 uses a specially cooled infra-red seeker to guide itself to a target. With the ability to reach more than twice the speed of sound, the AIM-9 is an important weapon for the F-16.
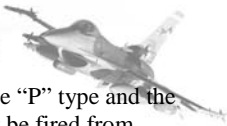
Falcon 4.0: Allied Force models two types of AIM-9 missile, the "P" type and the "M" type. The "P" type is called rear aspect, and generally must be fired from behind the target to achieve a kill. The "M" is all-aspect and can detect the target's heat signature from any angle.

Before using the AIM-9, make sure that the radar is set to A-A mode (press "RETURN" or the "A-A" button in the ICP panel beneath the HUD.) Figure 6-5 shows a view of the HUD with an AIM-9 selected.
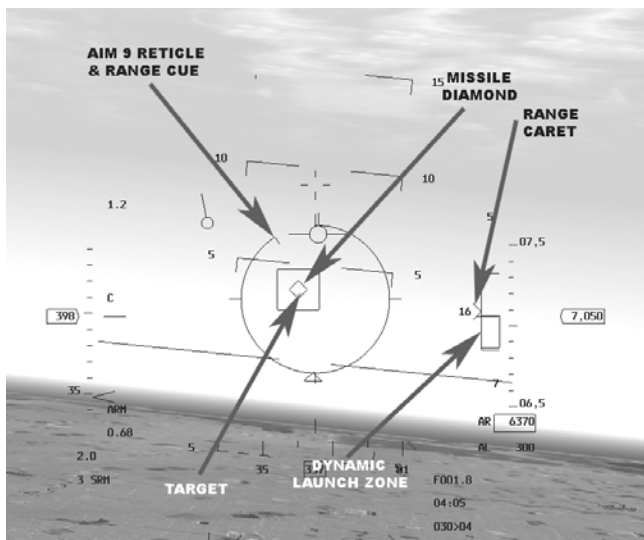
Figure 6-5

Remember that while the AIM-120 requires your aircraft radar for guidance during the initial part of the missile's flight, the AIM-9 requires no assistance after launch. Although the Sidewinder can be fired without first radar-locking a target, radar is nonetheless an important tool. A radar lock provides range information to the target and automatically points the AIM-9's seeker at the target. The missile's seeker provides feedback to the pilot using an audio tone. It ranges in pitch from a low "growl" with a low-quality lock to a higher-pitched whine with a high-quality lock.

Other important highlighted features are as follows:

RETICLE & RANGE CUE: This circle cue disappears in an anti-clockwise manner as you approach the target.

MISSILE DIAMOND: This icon indicates the direction that the missile's seeker head is currently pointing. The seeker itself can either be SLAVED to the radar, in which case it points at whatever is locked on radar. Or it can be UNCAGED, such that the seeker hunts around within set limits looking for a heat source. Consult the PDF manual on the CD-ROM for details on how to operate an un-caged Sidewinder missile.

Since you may have both "P" and "M" types onboard, check you've got the desired missile "in the chamber" on the right-hand MFD. The best way to learn is by trying it out, so go to Training Mission 15 and experiment on some slow-flying bombers.

Chapter 7: Air-to-Ground Radar

Air-to-ground radar allows the pilot to see features on the ground and pick ground targets. It maps the terrain with a radar beam and presents a picture in the MFD. The picture can be used as a guide to drop bombs on ground targets, even those which cannot be seen with the naked eye. *Falcon 4.0: Allied Force* has three main master air-to-ground radar modes and numerous sub modes. The three master modes are GM (Ground Map), GMT (Ground Moving Target), and SEA (designed to detect water-born craft.) The most frequently used mode is GM.
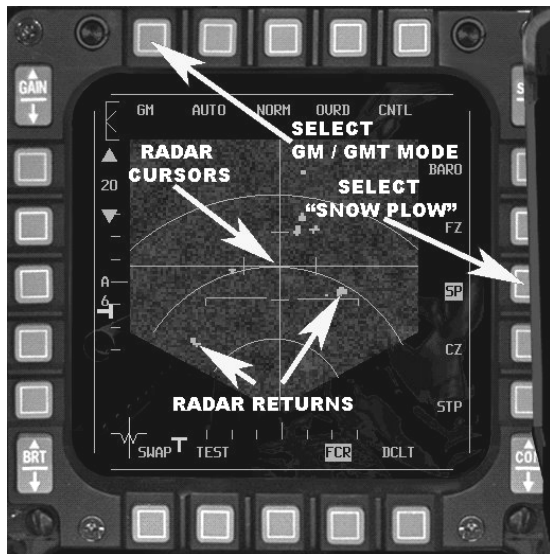
Figure 7-1

Figure 7-1 shows a typical Ground Map display that appears on the left-hand MFD. This mode is engaged by pressing "BACKSPACE" or by clicking the "A-G" button on the top right of the ICP panel just beneath the HUD and cycling to the display with "[".

Details

RADAR RETURNS: Returns could be anything from blocks of buildings to individual structures, shelters, bridges, or anything else which can generate a radar return.

RADAR CURSORS: Intersecting lines on the display which the pilot moves around to select individual radar returns. You'll need to do this to drop bombs in CCRP mode for example (more on that in the chapter dealing with air to ground weapons). These cursors can be moved using the UP, DOWN, LEFT and RIGHT arrows on the keyboard.

GM / GMT MODE: Changes the radar mode from one in which stationary objects are detected to one in which moving vehicles are detected. You would select GMT, for example, if your mission was to destroy a line of moving armor, such as tanks. But beware, once they stop moving, you can't see them anymore in the GMT mode, so you need to switch back to GM for a radar return. After pressing the MFD button to select GM, click the "GMT" button on the right-hand side of that screen to select the GMT mode.

SNOW PLOW: Disconnects the radar beam from the steer point, so that it is no longer tied to the selected steer point. This is used when you want a continuous radar scan of what is directly in front of the aircraft.

OVRD (Override): Shuts down the radar. This can be used when attempting to approach the enemy undetected. Remember that the radar beam you send out is like shining a torch in the dark. It allows you to see, but also means you can be seen.
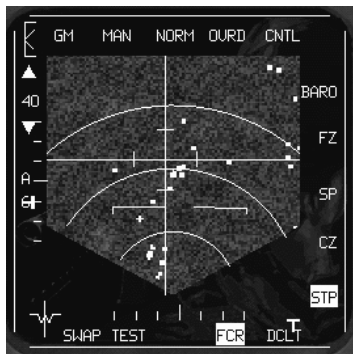
Figure 7-2
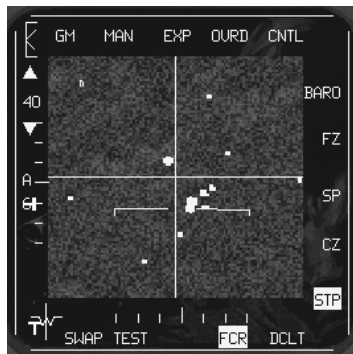
Figure 7-3

As you can see, radar returns have little definition. They appear blocky and it is difficult actually making out what you are seeing. Here's where you can enter sub-modes of GM radar. The modes, ranging from least to greatest radar resolution,

are: NORM (NORMal), EXP (EXPanded view), DBS1 (Doppler Beam Sharpening mode 1) and DBS2 (Doppler Beam Sharpening mode 2).
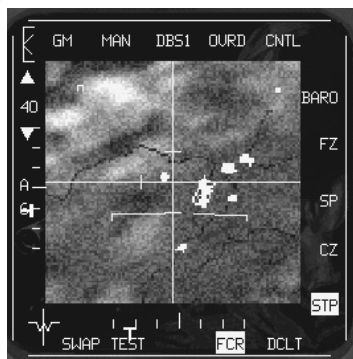
Figure 7-4
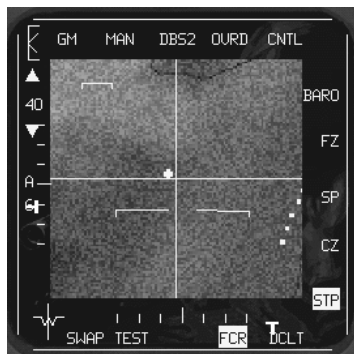
Figure 7-5

Figure 7-2 and Figure 7-3 show NORM and EXP modes. Figure 7-4 and Figure 7-5 show DBS1 and DBS2 modes. You can see how the resolution improves, but there is a trade-off: it takes longer for the radar to obtain the data the further up the resolution scale you go.
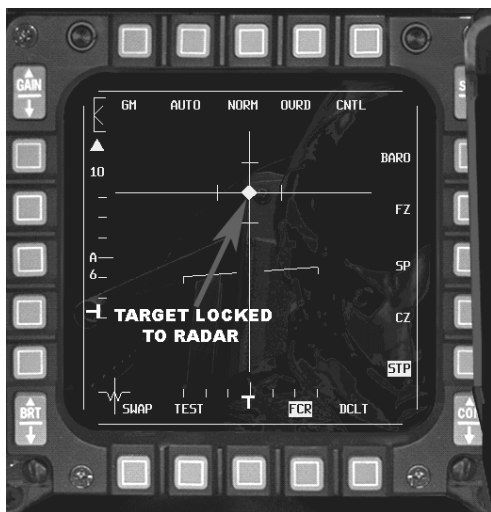
So we've now worked out how to find ground objects using radar. But in order to use it effectively, we need to be able to single out a particular object. This is needed when dropping bombs because, in one particular mode, the F-16's computer needs to know what we want to hit. To select a ground target, simply position the radar cursors, using the UP, DOWN, LEFT and RIGHT.

Once a target is locked up, all other targets are removed and the display becomes greatly simplified. In this mode the air to ground radar is now concentrating on one particular return. Now is the time for weapon deployment.

Chapter 8: CCIP

Free-Fall Bombs

We often hear about the pinpoint accuracy of weapons such as Laser Guided Bombs and Mavericks. These are highly advanced (and rather expensive) ways of delivering explosives to a target. But in *Falcon 4.0: Allied Force*, the F-16 can also carry bombs that don't have on-board guidance. These include the MK-84 and MK-82 weapons. Both are general purpose bombs. The MK-84 weighs 2,000 pounds and the MK-82 weighs 500 pounds. Just under half of the weight of each bomb is explosive materials.

The following guide is simplified to allow a new player to quickly learn how to drop bombs effectively. Refer to the full PDF manual for complete details on free-fall ordnance.
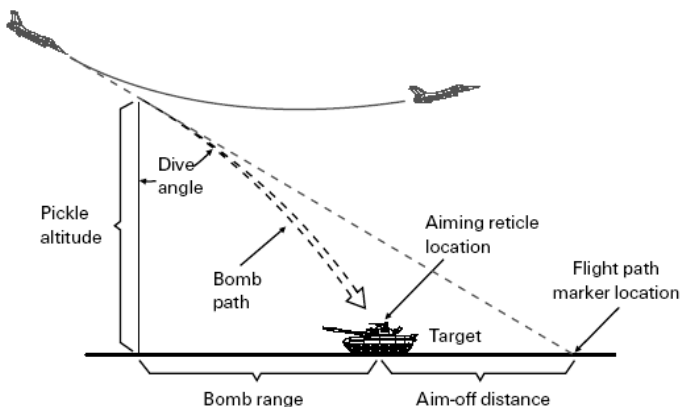
Figure 8-1

It's easy to understand that if an aircraft releases a bomb while flying at several hundred miles an hour, that bomb will impact the ground ahead of the point that the pilot pressed the bomb release button (called the "pickle".) Momentum carries the weapon forward as it falls. The onboard computers can assist the pilot in accurately

delivering free-fall ordnance. Here we look at two methods: CCIP (Continuously Computed Impact Point) mode and CCRP (Continuously Computed Release Point) mode.

Continuously Computed Impact Point

CCIP continuously displays a symbol in the HUD showing where a bomb would land if released at the current moment.

This point is represented by the pipper (Figure 8-2). Press the pickle and the bomb falls and impacts that point. You may change the HUD color as needed to make the view more clear.
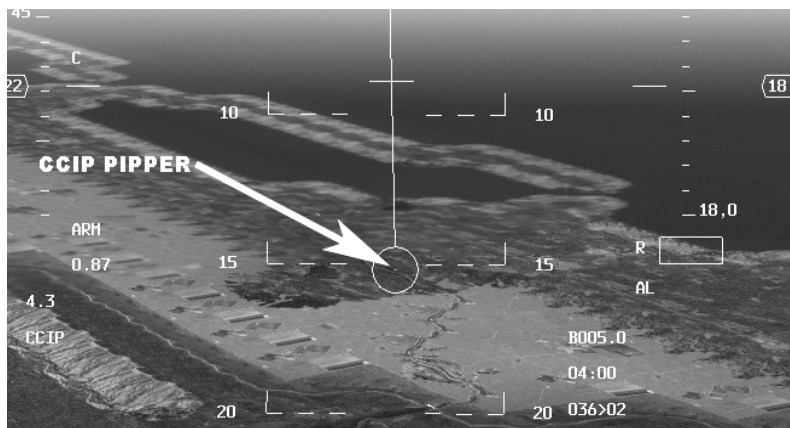
Figure 8-2

Sequence:

1. Launch the game then load the mission titled "19 Bombs with CCIP" from the training section. The target in this mission is a bridge.

2. Take off and fly towards the target which is at Steer Point 4.

3. Press "BACKSPACE" and call up CCIP by pressing "]" until the SMS page appears. CCRP appears in the MFD by default. Click the button above CCRP (Figure 8-3).

Figure 8-3

4. On the new page, select CCIP (Figure 8-4)
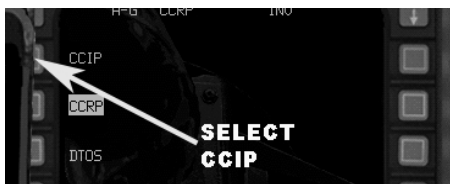
Figure 8-4

5. When you approach the target begin a shallow dive, say around 5 degrees.

6. When you're within visual range, place the pipper over the area of the bridge you wish to destroy. Go to "1" view to get a clearer view of the pipper and target if necessary (Figure 8-5)

Figure 8-5

7. When the pipper is positioned over the target, press the weapon release button. Pull up out of the dive and proceed to the next waypoint.

Chapter 9: CCRP

Continuously Computed Release Point

Although CCIP is an accurate way to drop bombs, it depends on the pilot's ability to see the target. Continuously Computed Release Point (CCRP) is useful when the pilot cannot see the target due to night or weather. It might also be too dangerous to make a lower-level attack onto a heavily-defended target. CCRP works in conjunction with the aircraft's Air to Ground radar. The pilot picks out the target on the radar screen and locks onto it. The radar cursors, which are positioned on the target, determine how far away that target is. Since the aircraft's Fire Control Computer knows the aircraft's height and speed, it can work out the correct point in time the bomb should be released to strike the target. The diagram below demonstrates the point.
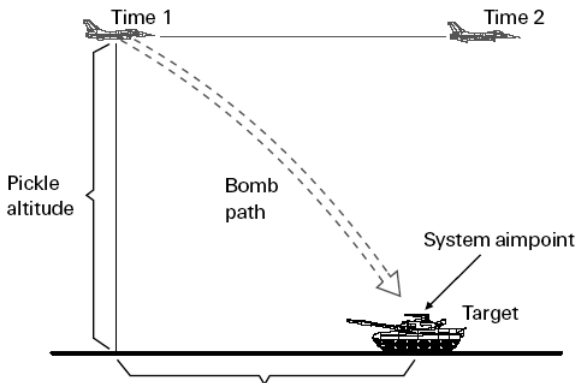
Figure 9-1

The important thing to remember with CCRP is that the pilot, when pressing the pickle button, only gives his consent to release the weapon. It's different from CCIP where the pickle button immediately releases the weapon. With CCRP, the aircraft decides when to release the bomb. That's the theory, so let's try it out.

Figure 9-2

Sequence:
1. Load training mission "18 Bombs with CCRP" from the training section. You'll start off in the air approaching the target.

2. Press "BACKSPACE" to get into A-G mode, or press the "A-G" button just underneath the HUD.
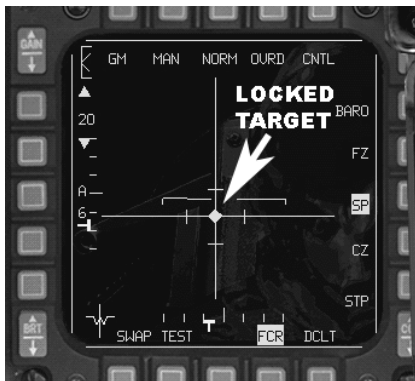
Figure 9-3

3. Looking at the radar returns on the left MFD, you'll see the bridge is particularly small on the screen (Figure 9-2). How do we know it is the target? Move the radar

40

cursors over it and verify that the Target Designator box (TD) in the HUD is over the bridge.

4. Lock the target by pressing "0" on the numeric keypad. Note how the radar display changes (Figure 9-3)

5. Now look at the HUD and press "1" on the main keyboard for better view (Figure 9-4.) You should see the TD Box over the target. You should also see a long vertical line, known as the Steering Line.
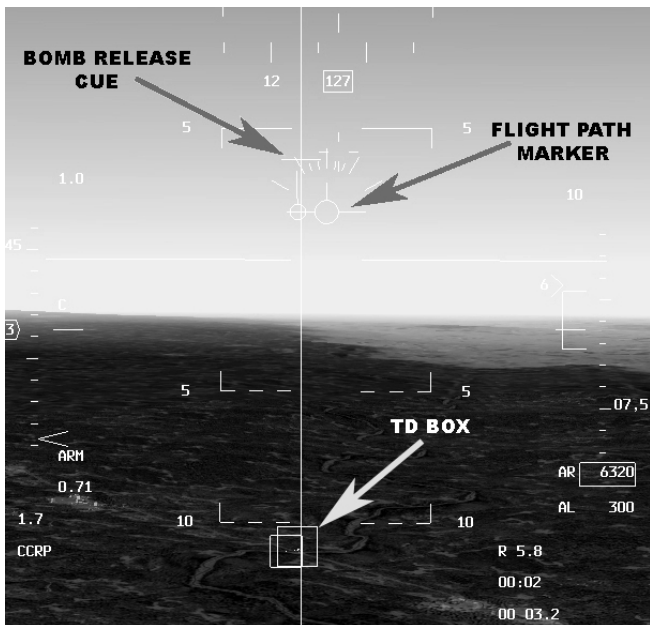
Figure 9-4

Continue towards the target, maneuvering so that your flight path marker is aligned with this line. Now, press and HOLD DOWN the pickle (bomb release) button. This gives the aircraft permission to automatically drop the weapon at the right moment for it to hit the target. As you near the target, the Bomb Release Cue moves down the Steering Line, at which point the weapon is released. To "loft" the bomb, make it travel in a prolonged arc towards the target, go to full power and pull back on the stick to put the jet into a 45 degree climb. If you stay roughly level, a flashing

circle (Reticle) appears, and the weapon will drop when the Bomb Release Cue
intersects the Flight Path Marker.
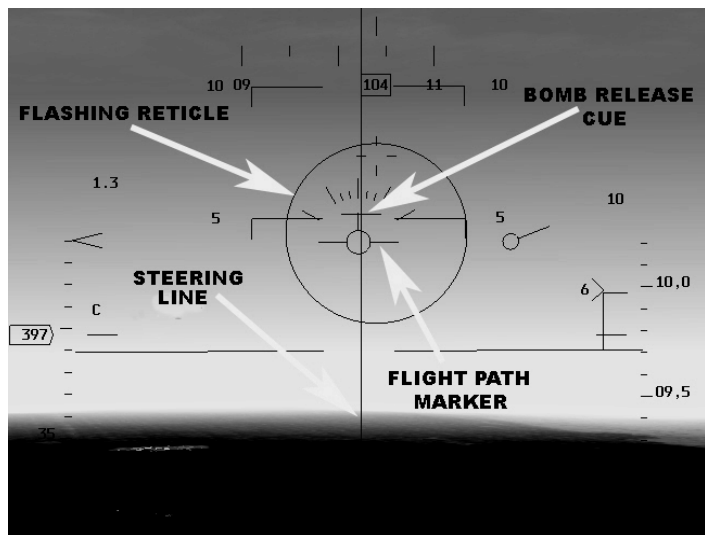
Figure 9-5

Chapter 10: AGM-65 Maverick

AGM-65 Maverick

One of the most important air-to-ground weapons carried by the F-16 is the AGM-65 Maverick. It is a high precision fire-and-forget missile with the ability to destroy tanks and other armored vehicles. During the Desert Storm conflict, more than 5,000 mavericks were launched with a success rate of 92%.

The first Maverick was delivered to the United States Air Force in 1972, the AGM-65A. It used a television camera seeker to guide itself to the target. Since then a family of Mavericks has been developed, using television guidance, infra-red sensor technology and laser designation as means to reach the target.

Infra-red sensors are particularly useful over TV-guided seekers because they see the target as a heat mass. Therefore, a camouflaged target is equally as vulnerable as one not camouflaged.

Figure 10-1

When targeting with the Maverick, the image generated by the missile's seeker is displayed to one of the screens in the cockpit. This image is used by the pilot both to see and select the target before launch and by the missile as guidance during flight. Begin by calling up the F-16's Air-to-Ground mode and selecting the AGM-65 weapon. Then power up the missile's electronics and "un-cage" it, removing the protective lens cap from the seeker. The missile now displays an image on one of

Multi Functional Display (MFD) screens in the cockpit. From here, it's a matter of panning the seeker camera around until the desired target appears on the display and is positioned inside the targeting gate on the MFD. Once achieved, the pilot locks the missile onto the target and launches when range is appropriate. The Maverick then guides itself to the target.

Sequence

1. Select Air-to-Ground mode by pressing "Backspace" or "A-G" on the ICP just under the HUD (Figure 10-1). Turn on "Master Arm" by flicking the switch to the bottom-left of the normal cockpit view.

2. Next, press the arrowed button on the right hand MFD (Figure 10-2) until the designation for the AGM-65 appears, which looks like <number>AG65<letter>. The number indicates how many mavericks are currently on the aircraft, and the letter to the right of "65" denotes the type of Maverick loaded, in this case the "D" variety.

Figure 10-2

4. Now it's time to power up the missile. Press the MFD button next to the "PWR OFF" indicator, so that it reads "PWR ON". Uncage the Maverick by pressing "U".
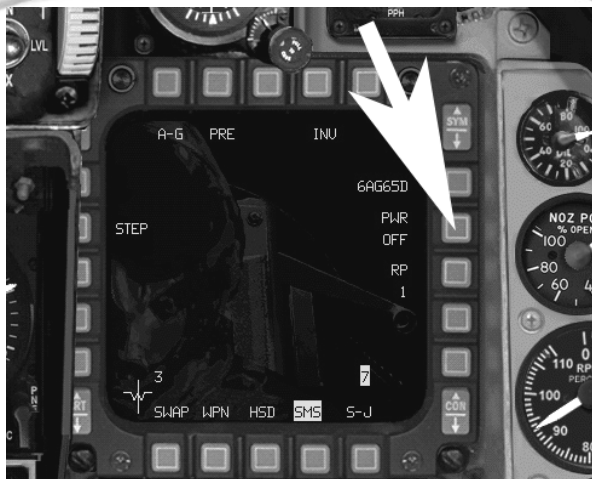
Figure 10-3

Figure 10-4

5. Select the Maverick's view on the MFD by pressing "]"so that the "WPN" symbol at the bottom of the display is highlighted (Figure 10-4).

6. Use the "UP", "DOWN", "LEFT" and "RIGHT" arrows next to the keypad to move the seeker head on the missile. This allows you to pinpoint the target. You should see that a box moves around the HUD corresponding to the point where the Maverick is "looking" in the view out ahead. Currently the Maverick is "slaved" to the radar, and you can't fine-tune the Mavericks target this way. Press "0" on the numeric keypad to switch the "SOI" (sensor of interest) to the Maverick display. Now use "UP", "DOWN", "LEFT" and "RIGHT" to home in on your desired target.

7. Press the button above "FOV" (Field Of View) to get a magnified view of the targets, which at this point appear as little more than dots on the screen (Figure 10-5). Press it again to get back to "FOV" from "EXP" (EXPanded view).

8. Make sure the target is within range by checking the position of the caret on the launch zone indicator (Figure 10-5). In this figure the target is just within range. The caret moves down the vertical range scale as you get closer to the target.
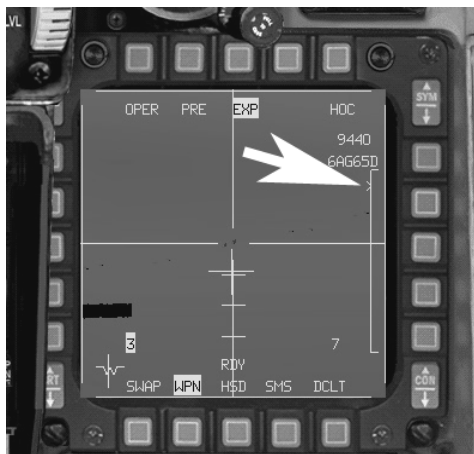
Figure 10-5

9. Position the desired target in the center of the display and press the "0" key on the numeric pad to "lock" the Maverick to the target.

10. Press "SPACEBAR" to fire.

Chapter 11: HARM

High-Speed Anti-Radiation Missile

The greatest threat to pilots in recent wars has been from the Surface-to-Air-Missile, better known as the SAM. These weapons are fired from the ground at attacking aircraft. Most types of SAM use ground-based radar for targeting and guidance. One of the most famous incidents was in 1960, when the USAF pilot, Gary Powers, was shot down in his U-2C spy plane over flying the USSR. He survived, but was captured by the Soviet authorities, tried for spying, convicted and jailed for two years before returning to the United States. More recently, Yugoslav SAMs were reported responsible for the loss of an F-117A Night Hawk aircraft over Kosovo in 1999.

A SAM site consists of one or more missile launchers and a radar station. The radar station scans the sky searching for enemy aircraft. When detected, a missile (or series of missiles) is launched in attempt to destroy the threat. These missiles are guided either by onboard radar or by commands sent from the radar station on the ground. Therefore the key to neutralizing a SAM site is to knock out its radar. That's where the HARM (High Speed Anti Radiation Missile) comes in.

HARMs work by homing in on the radar emissions from the ground station and destroying it. The F-16 carries advanced equipment which allows radar emissions from the ground to be detected. It can distinguish between different radar emitters, helping the pilot to determine what type of SAM is threatening the aircraft.

When these emissions reach the aircraft, computers process the information and present a "God's Eye" view of the area around the plane, depicted on the MFD in the cockpit. Symbols indicate the type and location of each enemy radar source. The pilot simply selects the threat he wishes to destroy, and launches a HARM. The beauty of the HARM is that once it leaves the rail, it is guided using radar emissions from the target. However, radar operators on the ground can employ a tactic known as "blinking" whereby the radar is switched off and back on in an attempt to confuse the missile into loosing its lock. This practice can be effective in delaying a HARM launch, but these days advanced software in the HARM system is capable of taking out even these "blinking" targets.

Sequence:

1. Load up Training Mission "25 HARMs," which presents SA-2, SA-3, SA-4 and SA-6 threats along the route. Set "Invulnerability" to ON in the set up screen (you'll need it) and join the mission.

Figure 11-1

2. You'll start in the air approaching Steer Point 2. Select A-G radar and choose the AG88 missile by clicking the button on the right-hand MFD next to the current weapon's name. Figure 11-1 shows a search radar return on the HTS display. The target we'll be concentrating on is at Steer Point 2, so continue to head for that.
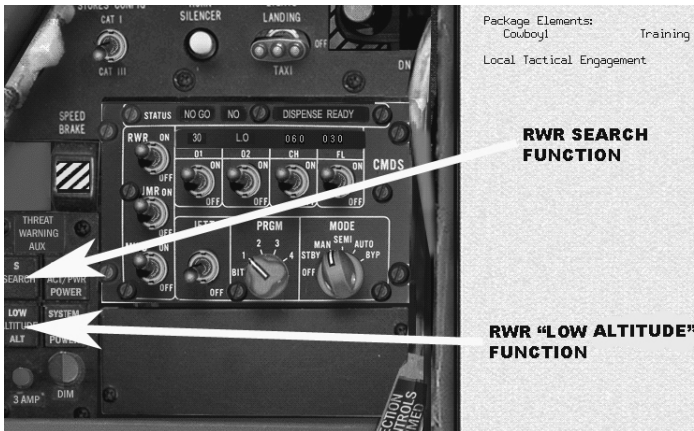
Figure 11-2

3. Set your Radar Warning Receiver (RWR) to allow "search" radars on the ground to be picked up. Before a SAM can launch, its radar has to search the skies. This can be detected by the RWR. Select the search radar and low altitude option using these buttons in the cockpit (bottom left-hand side). See Figure 11-2.

4. Move the radar cursors on the MFD using the UP, DOWN, LEFT and RIGHT arrows until you position the little two vertical cursor lines over the "2" figure at Steer Point 2 in front of you once the "2" appears. As you get closer to the target, reduce the range of the HTS to 15 NM or so by pressing the range arrows on the MFD. When you have the cursors over the "2", press "0" on the numeric pad to lock the target (Figure 11-3)

5. Now switch to "1" HUD view by pressing the "1" key on top of the keyboard. At this stage you're just about ready to launch the HARM. Make sure that you are in range by checking that the "RANGE CARET" is somewhere within the "HARM RANGE SCALE." When within range, a flashing "IN RANGE" cue appears. See Figure 11-4.

Figure 11-3
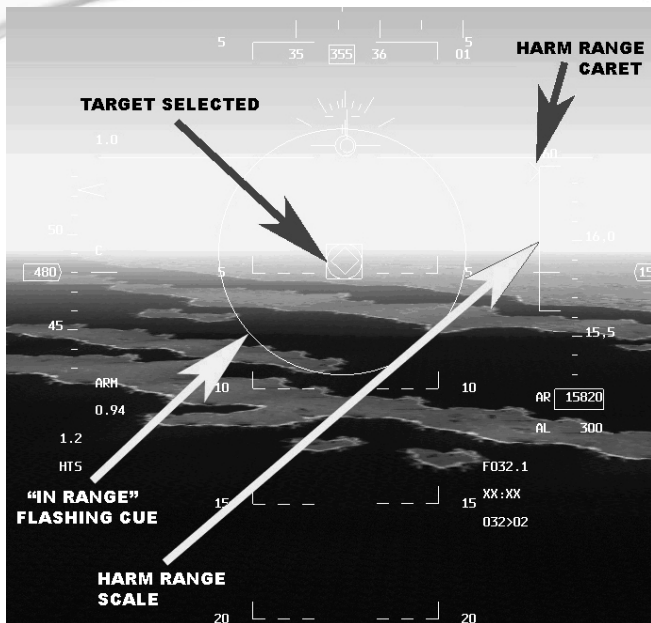
Figure 11-4

6. All that's left to do is to press SPACEBAR or your joystick FIRE button to launch the HARM. By this time, SA-2 missiles may well be launching at you (hence the need for invincibility mode in training missions!) But notice that once the HARM destroys the target's radar, the SA-2 missile is no longer able to track your aircraft. They simply fly blind. Also, the "2" warning symbol in the RWR will go out, indicating that the SA-2 is no longer a threat.

Chapter 12: RWR

Radar Warning Receiver

The concept of an electronic battlefield has never been more important than it is today. In an age of highly sophisticated systems designed to defeat enemy forces, wars can be won and lost on the crucial ability to use the electromagnetic spectrum to best effect.

Figure 12-1

How it Works

To put it simply, nothing will save your skin more than the RWR. Its job is simple: to detect and prioritize radar emissions reaching your aircraft. These emissions may come from a variety of sources, both enemy and friendly, including SAM sites, ship-based search radars, radars onboard aircraft and, most importantly, missile radar. Radar emissions may be from a harmless entity, such as your wingman, or they might indicate a serious threat, such as the launch of an AA-12 missile from a Su-27.Figure 12-1 shows a typical RWR display.

In Figure 12-1, the "16" symbol refers to an emission from an F-16 radar which lies dead ahead. The diamond symbol surrounding the "16" means that it is the highest priority emission, maybe due to the strength of the radar beam from this particular aircraft. You can see two other "16" symbols indicating two other nearby F-16s. To the left of the display, the upturned symbols represent unknown aircraft types.

Figure 12-2

Figure 12-2 shows an SA-6 SAM launcher. At this point the aircraft is beyond the lethal range of the SAM, yet the SAM's search radar is operating and registers as an emission on the RWR with an "S". Because it has the strongest signal, it is deemed to be the highest priority. You'll notice a collection of other "S" symbols. These are lower priority radars around the battlefield. The semicircle icon over the "S" in the left side of the display indicates that it is the most recent emission to register on the RWR.

Figure 12-3

RWR Symbols:

Figure 12-3 demonstrates what happens when we fall into the range of the SAM site. The "S" with a diamond around it now becomes a "6" with a diamond around it, signifying the SA-6 search radar has locked onto your aircraft. Time to take evasive action pretty soon: this SAM is most likely to launch at you in this scenario. There are of course a variety of symbols in the RWR. Below is a list of those most commonly used by the game.

RWR Symbology

Search radar	S
Unknown radar	U
Active radar missile	M
Hawk	H
Patriot	P
Naval	⛴
Modern aircraft	⌁
Older aircraft	△
Anti-aircraft artillery	A
Surface-to-air missiles	2,3,4,5,6,8,15
Chaparral	C
Launch warning	②
Highest priority target	◇C◇
Nike/Hercules	N

Figure 12-4

Now, imagine the RWR as a display representing a "God's Eye" view of the battlefield, and your aircraft is slap bang in the center of it. The positions of the symbols represent the relative bearings of the object which is emitting the radar signal. For example, in Figure 12-1, the F-16 highest priority threat would be somewhere to your seven o'clock position, i.e. right back behind your left shoulder. But here's the crucial thing: the proximity of the symbol to the center of the RWR display does not correspond to how far away that emitter is. It corresponds to the strength of that emitter. Put simply, the closer an emitter symbol is to the middle of the display, the greater the strength of that emitter. For the new player, this may seem confusing because the display conveys bearing but not distance. It's just something you get used to. Now, let's look at the threat warning lights in Figure 12-5.

Figure 12-5

Threat Warning Lights:

HANDOFF: Press this button and you can cycle through the threats on the RWR in order of radar strength. This function can be useful in prioritizing threats. When it's lit, it means the selected target (identified by a diamond enclosing the symbol) is not the highest threat.

LAUNCH: When this is lit, you're in trouble. It means a missile has been launched at you either from a SAM site, an aircraft or a ship. Take evasive action immediately. Note that infra-red missiles will not show up as a launch (because they do not use radar as guidance).

PRI MODE: Means Priority Mode. When it is lit, the RWR is in priority mode and only the five highest priority threats are displayed. When it is unlit, up to 16 threat symbols may be displayed.

NAVAL: The button with the ship symbol increases the priority of naval threats. If the button is unlit, naval threats are a lower priority than air or ground threats.

UNK: The Unknown button controls the display of unknown or undetermined radar energy sources. In most cases, the TWS can determine the type of radar. However, if it can't make a determination, it normally doesn't display the source. The default (unlit UNK light) is to ignore unknown radars. However, if you press the UNK button, the unknowns will be displayed on the RWR as "U" symbols. If this button is unlit and an unknown threat is detected, this button will flash.

TGT SEP: Press the Target Separate button to un-stack threat symbols that overlap each other on the RWR display. If threats are in the same general orientation to your aircraft, they may overlay each other on the display. Normally the RWR shows all threats at their true azimuth relationship to your aircraft. If you press TGT SEP, the highest priority threats remain where they are but the lower priority threats are moved radially away from the center. This allows you to see all the threats more easily.

Additional Controls:

There are additional controls for the RWR. These can be found by looking at the bottom, left hand corner of the cockpit (one click left + one click down on joystick HAT). (Refer to Figure 12-6.)

Figure 12-6

S SEARCH: enables all search radars to be displayed in the RWR. While this gives additional information to the pilot about the electronic emissions in the battlefield, it can mean that the pilot is presented with too much information.

LOW ALTITUDE ALT: Enables the RWR to receive emissions from low altitude radars.

POWER: Power up the RWR, and power down the RWR.

Chapter 13: Tactical Engagement

"Tactical engagement" is the term used by Air Force personnel to describe any planned encounter with the enemy. When actual missions are created, Air Force personnel rely on tools similar to ones in the game's Tactical Engagement editor. This chapter walks you through the Tactical Engagement editor and shows you how to create missions that closely parallel actual military procedure and structure. After you finish reading this chapter, you will be able to create both simple missions to test an idea and lengthy mini-campaigns involving numerous warring nations, ground forces and sorties so thick you can cut 'em with a knife.

Opening Screen

Tactical Engagements lets you create new engagements and edit or join existing ones. The opening screen is divided into three areas:

<u>Load Mission</u> allows you to choose the mission or engagement you'd like to fly, edit an engagement or join one online. You can choose to create a new mission, load a saved engagement or join an online engagement (after you connected to a multiplayer server). This chapter shows you how to create new engagements and edit the missions that appear under the "Missions" tab.

Theater Map appears only after you have selected a mission. This map displays the balance of forces in the currently selected engagement. Each team involved in the engagement is represented by a different color on the Theater Map. The different teams that make up the engagement are listed to the left of the Theater Map. If you want to fly a saved engagement, the Theater Map is where you'll choose the team you'd like to join.

Mission Description appears only after you have selected a mission. This overview provides a quick synopsis of the engagement or mission.

Playing a Tactical Engagement
If you are playing a tactical engagement (rather than creating or editing one), you will not be able to access the Tactical Engagement editor tools described below.

When playing a mission, you can create and plan mission packages, as well as issue orders to ground units--but you cannot add new units or squadrons, or drag units to a new location. In addition, Teams and Victory Conditions can only be edited when building a mission.

You may also notice many similarities to playing in the Campaign. In the Campaign, a large planning staff is working tirelessly behind the scenes to determine the most valuable targets and to frag out orders for all the aircraft and ground units on your team. In Tactical Engagement, you are the planning staff as well as a pilot. (Actually, the person who built the mission may have planned out some missions and orders for you already.) In the Campaign, you can only fly missions assigned to your chosen squadron. In Tactical Engagement, you can fly any F-16 mission--plus, if you don't see any you like, you can plan a new mission

(as long as aircraft are available). Finally, in the Campaign, since victory depends as much on destroying the enemies' will to fight as on achieving specific military objectives, there is no concrete list of victory conditions. In Tactical Engagement, the military objectives you must achieve to succeed are clearly spelled out in the victory conditions and are assigned a point value.
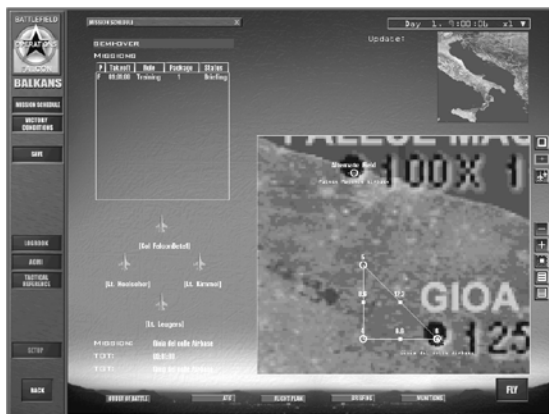
Loading a Tactical Engagement

Loading a tactical engagement involves a few simple clicks and then you're on your way to participating in a new mini-campaign or sortie. To load a tactical engagement, follow these steps:

- Click on Tactical Engagement in the main menu.

- Click on the filename for the engagement you'd like to play.

The right side of the screen displays the Theater Map and the Mission Description. Click on the team flag you'd like to join in the Theater Map, and then review the mission below. When you finish, click on the Commit icon in the bottom right corner.

The Mission Schedule window will open. Click on the mission you'd like to fly in the Mission Schedule list, review the flight plan and briefing, and then click on the Fly icon in the lower right corner to take off!

If you forget to stop the clock while you're dilly-dallying around looking at the briefing or fiddling with loadouts, the flight you want to fly may take off without you. You can still jump into the mission even though it has departed simply by clicking on the Fly icon. The game drops you into the mission wherever the aircraft

is located, provided that the flight has not reached its last steerpoint before the target (called the IP or Initial Point).

Quick start: Building a Simple Mission

The fastest way to build a mission in the Tactical Engagement editor is to accept most of the defaults. This section shows you how to build a simple air-to-ground mission that includes an enemy intercept near the target point.

- Select Tactical Engagement in the main menu.

- Click on the Mission Builder button. The screen changes to show the Mission Builder.

Adding a Ground Strike

When you start a new engagement, the computer assumes you're flying for the United States or NATO.

- Right-click on the map and choose Installations - War Production. Click on the map to close the pop-up menu. Now you see things you can blow up!

- Zoom into an area near the border between blue and red forces by clicking on the "+" button in the lower right. To move the map after you enlarge it, drag the map by clicking and holding down the mouse button as you move the mouse. If your mouse is equipped with a wheel, you can also use this to zoom in or out of the map.

- Click on the Add Package button to the right of the map.
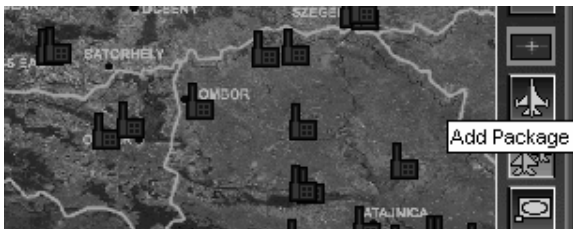
- Click on the Krsko Nuclear Plant, which looks like a radiation symbol and is located near the top of the map. (To find the Krsko nuclear plant on the map, turn names on or hold your mouse cursor over the icon until a map label appears.) After clicking on the nuclear plant icon, the "Add Package" window appears.
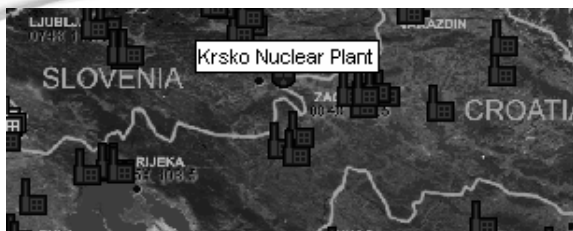
- Lock the takeoff time by clicking on the padlock icon until it is green and in the locked position.
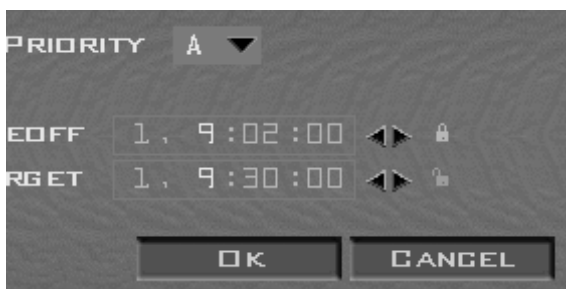
- Click on the "New" button and the Add Flight window will appear.

- Review the defaults that the game automatically computes for the mission. Ensure that the Aircraft type is "F16C-52" and that the "Role type" is "Strike" (more on what each role means at the end of this

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chapter). Click on the "OK" button to close the "Add Flight" window. Your flight will appear in the "Add Package" window.

- The takeoff time appears in the package window. The mission planner automatically computes steerpoints to the target, and you will see the flight plan on the map.

- Click on the OK button in the Add Package window.

- Click on the Flight Plan icon at the bottom of the screen.
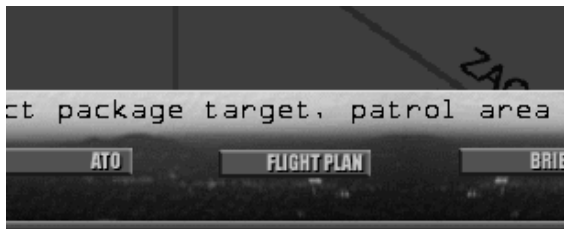
- Cycle through the steerpoints by clicking on the right arrow next to STPT (Steerpoint) until you see TGT (Target). Click on the Assign button that appears at the bottom of the window.
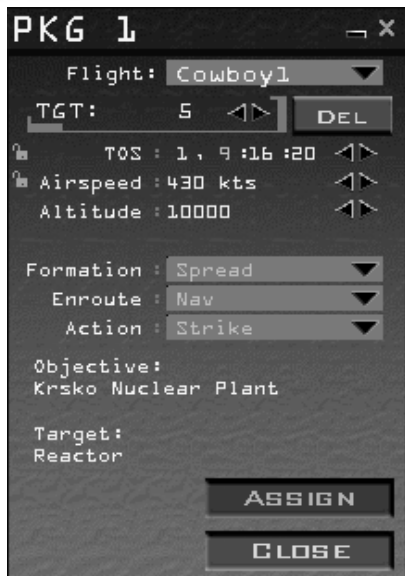
- When you click the "Assign" button, the Target List window will appear. Scroll through all the targets in the vicinity of your steerpoint. Expand the target list for the nuclear power plant by clicking on the "+" sign. Select the specific target that you want destroyed at the nuclear power plant site, and its name will turn green.
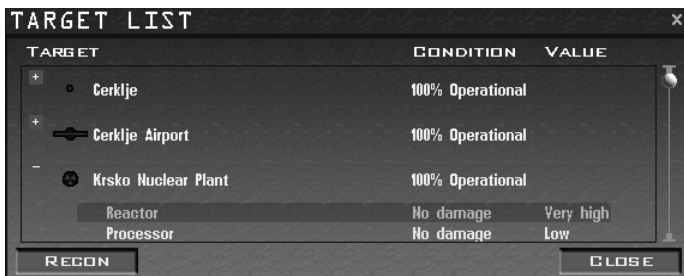
- Click the "Recon" button to see a satellite image of the target. Verify that it is the target you want. Then close the Recon window by clicking on the "X" in the upper right- hand corner.

- Confirm the target selection by pressing ASSIGN.

- Verify that the correct target is shown in the Flight Plan window. When you finish, close the Flight Plan window.

- Click on the "Briefing" icon at the bottom of the screen. This is automatically filled in after you select a flight plan and target. Scroll through the briefing to see your mission objectives and munitions for your wingmen. Munitions for the mission are automatically configured. Close the Briefing window when you're finished reading.

- If the Add Package button is green, click on it again to deselect it.

Adding Opposition

A bomb run is challenging, but it's even more adventurous when you have two MiGs barreling down on you from above. To add an intercept mission to your new strike sortie, follow the steps listed below:

- Click the Fit Flight Plan button (in the lower right, below the "+" button) so you can see the entire route from takeoff to target.

- Turn on the icons for the fighter planes by right-clicking on the map and selecting Air Units - Fighter from the pop-up menu.

- Click on the "minutes" field of the clock above the map and click the right arrow to advance the clock. As you advance the clock, the icon for your F-16 flight will appear and begin moving along the flight plan. Keep advancing time until your flight's icon appears halfway between your airbase and the target on the route. Now you're going to add a package to intercept your flight.

- Change teams by clicking on the Team Selector button in the top right. The default team is the NATO in blue. Click on the Team Selector button to select FRY (the other flag).

- Turn on map labels by right-clicking on the map and selecting Names.

- Zoom in on your blue F-16 icon by clicking the "+" button until the map labels are readable.

- Click on the Add Flight icon (just below the team selector icon on the right). Then click on the F-16 icon for your flight, which appears along the route.

- The Add Flight window will pop up again. Change the aircraft to a MiG-29A by selecting it from the Aircraft drop-down list.

- Check to make sure that Role is set to "Intercept." The target will change automatically to the closest aircraft that can be intercepted. Check that the target is your flight name (as seen on the map).Not every aircraft type can fly every mission. If you choose an attack aircraft, such as an Su-25, Intercept will not be available in the Role drop-down list.

- Click on the OK button in the Add Flight window.

- Click on the Flight Plan icon at the bottom. Cycle through the steerpoints until you see TGT. Then confirm that the target matches your flight's name. Click the "X" button in the upper right-hand corner when you're finished.

Adding Victory Conditions

Now, it's time to add some victory conditions to the mission you've built. Victory conditions establish what a team needs to do in order to complete its mission successfully.

- On the left side of the screen, click on Victory Conditions

- Zoom in on your flight's target (which is the Krsko nuclear power plant) by clicking the "+" button. Drag the map to center the target. Right-click on the icon for the nuclear power plant.

- Select "Add Victory Condition" from the right-click menu. The victory condition will appear in the window below.

- Make sure that the victory condition is assigned to your team, which is NATO. If not, select the correct team from the drop-down list.

- The victory condition is automatically configured for destroy or degrade. Select "Destroy" from the drop-down list. After the Target List window appears, click on the "+" sign to expand the target list. Click on the reactor at the nuclear power plant site that you assigned yourself earlier. It will highlight in green.

- Select the "ASSIGN" button to mark the Reactor as target.

- Right-click on the map and select "Show Victory Conditions" from the pop-up menu. You will see a blue diamond around the target icon in your team color. You will also see "Victory Condition 1" underneath the name of the target.

#	Team		Victory Condition	Points	
1	NATO	Destroy	Krsko Nuclear Plant	1000	NEW
					DELETE

ORDER OF BATTLE   ATO   FLIGHT PLAN   BRIEFING   MUNITIONS
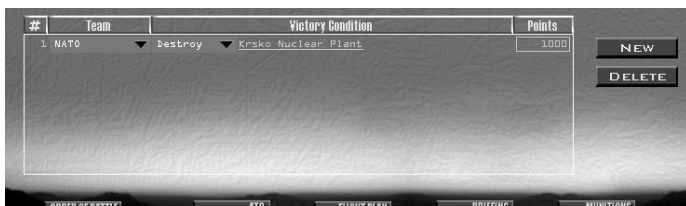
- Now, we're going to assign a point value for successfully destroying the target. Click in the "Points" field, type a new point value of 1,000 and then press return. Notice that 1,000 points have been added to NATO team on the victory conditions summary section on the upper left..

- Let's set the victory conditions for the other team. Click the New button to create a new victory condition.

- Change the team assignment to North Korea.

- Click the underlined word "Assign" to the right. Move your cursor over your flight's icon (the blue F-16) and hold it there until you see your flight's name pop up. Now click on your flight's icon to select your flight as the new target for the other team's victory condition.

- Make sure that the Victory type is set to "Intercept" and that the name of your flight appears under Victory Condition.

- To set the minimum number of destroyed aircraft required to complete this intercept mission, select "1."

- Enter the number of points for meeting the Victory Condition as "1,000" and press return.
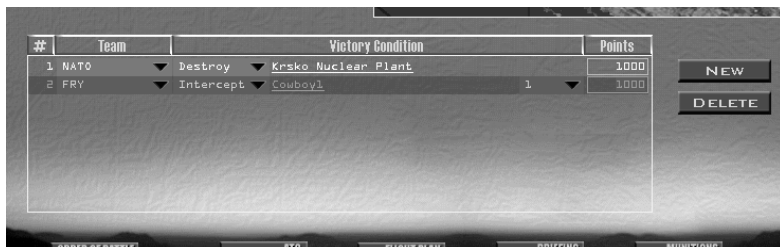
- Click on Points for Victory at the top of the Victory Condition window and type in the required points for any team to win. Type in "1,000" so that either team can win the mission.

- Under "Mission Type" at the top of the window, select "Sortie" (not "Engagement").

- Change the Start Time clock to "1, 8:57:00" (Day 1, 8:57 AM).

- Set the Time Limit for the mission to "1, 12:00:00."

- Set the Tactical Engagement clock back to "1, 8:57:00." Otherwise, the mission may start without you when you load it.

- To save your brand-new tactical engagement, click on Save on the left side of the screen. Give the mission a name in the text field at the bottom of the dialog box. Click the Save button to save your tactical engagement.

Whew, you've completed creating your first tactical engagement... but, now it's time to fly it! Save your TE, then hit "BACK". In the Tactical Engagement window, under missions, you'll see your TE. Select it, and select "COMMIT" if you're happy with the options and you'll arrive in the "MISSION SCHEDULE" screen. Click on your flight in the window under "FLIGHT", click on the relevant aircraft to choose your position in the flight then hit "FLY".

Aircraft Mission Roles

The Role field in the Add Flight window lists the missions the selected flight can fly. The table below outlines the missions you can choose when building packages and flights.

Type	Purpose	To Achieve Success
DCA	Defensive Counter Air. A counter air mission designed to protect friendly assets in and around the station area.	Stay on station (unless redirected or relieved by AWACS) and ensure that no friendly targets in the station area are destroyed.
BARCAP	Barrier Combat Air Patrol. A counter air mission flown to protect a lane for a given period of time. DCA missions are tied more to a specific asset, whereas BARCAPs are used to protect a defined airspace from enemy approach.	Stay on station for the fragged time (unless redirected or relieved by AWACS) and do not allow enemy aircraft through.
HAVCAP	High Value Asset protection Combat Air Patrol. An air-to-air mission designed to protect an asset such as a friendly AWACS aircraft or tanker.	Ensure that the high-value asset is not destroyed during time on station.
TARCAP	Target Combat Air Patrol. An air-to-air mission designed to protect friendly attack aircraft at a target area.	Protect friendly aircraft at the target.
RESCAP	Rescue Combat Air Patrol Mission.	Protect rescue helicopters.
Ambush Cap	A counter air mission flown in an area shielded from enemy radar. Aircraft assigned this mission will evade detection for as long as possible so they can attack at close range.	Stay on station for the fragged time (unless redirected or relieved by AWACS) and do not allow enemy aircraft through.
Sweep	Aggressive counter air patrol into enemy territory.	Kill as many enemy aircraft as possible without taking losses.
Intercept	Air-to-air interception of enemy aircraft.	Destroy assigned target or force them to abort their

mission.

Escort	Protect a strike package from enemy aircraft.	Ensure the package reaches the target with no losses from enemy aircraft.
SEAD Strike	Suppression of Enemy Air Defenses.	Reduce enemy air defense assets by destroying radar or launch vehicles.
SEAD Escort	Suppression of Enemy Air Defenses. Protect a strike package from enemy air defenses.	Ensure the package reaches the target with no losses from enemy air defenses.
OCA Strike	Offensive Counter Air strike. A mission flown against enemy assets (such as airbases or search radar systems) designed to degrade an installation by at least 30%.	Make sure you hit the assigned target or reduce its operational status to help obtain air superiority.
Strike	Air-to-ground mission flown against a wide variety of enemy targets.	Hit the assigned target or reduce the operational status by at least 30%.
Deep Strike	Air-to-ground missions flown against a wide variety of enemy targets deep in enemy territory.	Make sure you hit the assigned target or reduce the operational status by at least 30%.
FAC	Forward Air Control. As part of an On-Call CAS package, FAC aircraft locate and assign enemy targets to CAS aircraft.	Assist in the destruction of as many enemy vehicles as possible.
On-Call CAS	Close Air Support. CAS missions are strike missions flown against enemy army units that are in close proximity to friendly forces. Specific CAS targets are usually passed to the fighter from a FAC.	Destroy as many enemy vehicles as possible.
Pre-Plan CAS	Pre-planned Close Air Support. Pre-planned CAS missions are flown against known targets, usually without the	Destroy as many enemy vehicles as possible.

assistance of a FAC.

CAS	Close Air Support.	Destroy as many enemy vehicles as possible.
Interdiction	Air attacks on enemy logistics and reinforcements moving toward the front.	Cause as much damage to the target as possible.
Recon	Reconnaissance. Mission designed to photograph a target site for intelligence purposes.	Photograph the target from within 2 miles slant range.
BDA	Battle Damage Assessment. BDA missions are identical to reconnaissance missions except they are flown to get post-strike pictures of the target area.	Photograph the target from within 2 miles slant range. You must photograph the target after the attack.
Anti-Ship	Strike enemy naval forces.	Cause as much damage to the target as possible.
Training	Practice missions flown prior to battle.	A sortie that is designed to teach a particular method or idea. These missions are available depending on the type of aircraft being flown.

Chapter 14: The Campaign

Welcome to one of the most impressive features of *Falcon 4.0: Allied Force* -- the Campaign. This is where you'll fight out battles in what you'll feel to be a living war. The campaign, which ever one you'll chose to fly in, will allow you to take part in a full-scale dynamic battlefield scenario, where outcomes are decided not only by the actions you take, but also the actions of computer-controlled aircraft and ground forces. Think of it as a gigantic soup of action and reaction which makes a war evolve in a realistic, challenging and thrilling manner.

Understanding the Campaign

Before we look at the detail of Campaign, let's examine the way that the Campaign works. Describing what drives the campaign isn't easy. The best way is probably to envisage the Campaign Engine as our Universe. The Universe in Falcon is full of entities, such as a tank, an engineering unit, a Mig-21, an F-16 or in fact anything else that exists in the campaign database. These entities are like the planets and galaxies that fill the void in our real world Universe. But of course in our real Universe planets and galaxies interact with each other. They do this with forces such as gravity. In the Falcon universe, the force of interaction is not gravity, but "AI" or Artificial Intelligence. AI gives an entity "character". It is the computer code which determines how everything acts and reacts in the campaign. And it is this multitude of "character" which determines how the campaign evolves.

The Campaign runs when you are in the Mission Schedule screen of the User Interface, as well as when you are sitting in the pit flying. As long as the clock is running, the Campaign Engine is running too. If you wanted to, you could leave Campaign running for hours or even days on its own. It will continue the intricate and complex process of analyzing what interacts with what, and what those outcomes are likely to be. It's an extremely powerful feature. So the Campaign takes place real time. Air and ground movements occur simultaneously in the Campaign. While you study intelligence or reconfigure the steerpoints for your mission, other missions are being flown and the face of the war continues to change.

Campaign: A Quick Start
A quick rundown of how to start a campaign quickly and fly:

- Choose your Battlefield via the first User Interface screen. Confirm with "OK".

- Select "Campaign" from start up User Interface Screen.

- Choose your type of Campaign from the list of three.

- Select your Airbase and Squadron by clicking the appropriate airbase icon on the map. Press the "COMMIT" button.

- Adjust Priorities, or simply accept them with "OK".

- Start the Campaign by pressing "OK" when prompted.

- Select your mission in the Mission Schedule Screen and select the aircraft you want to pilot.

- Read your mission briefing by pressing "BRIEFING", close with "OK".

- Adjust your weapons loadout by selecting "MUNITIONS", confirm with "OK".

- Press "FLY" and choose TAKE-OFF option.

- Wait for the clock to countdown.

- After the mission loads, you're in the cockpit ready to fly.

- It sounds complicated, but you can go from starting the campaign to flying in less than a minute.
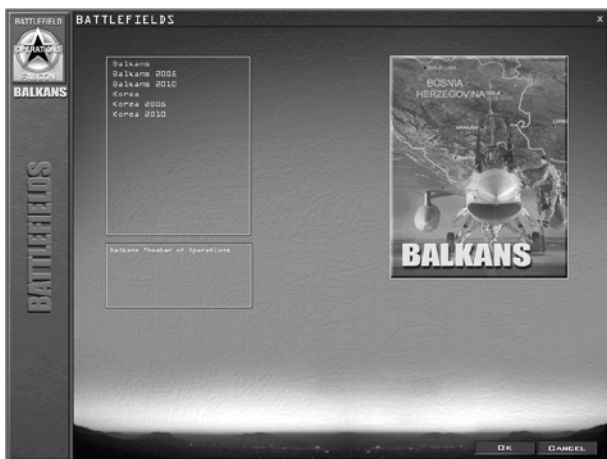
Campaign: In Detail

Your first choice on firing up the campaign for the first time to decide which one you want. *Falcon 4.0: Allied Force* features six battlefields. Three are based on the

Balkans theatre of operations and three on the Korean theatre. You can get to the screen below by pressing the "Battlefield" button on the main screen.

The main campaign battlefields are the Balkans and Korea. Those marked with 2005 and 2010 are modified versions of the main campaigns with more modern aircraft, such as the F-22. Whatever theater you chose, each has three separate campaigns offering varying levels of difficulty. Each scenario represents a specific military condition. Once you enter one of these scenarios, you are placed in the middle of a significant military action involving ground, naval and air assets. You play the part of a fighter pilot. You choose the squadron you want to fly with and pick your mission from a daily list of sorties being generated by headquarters. This headquarters is called Air Command (short for Air Component Commander) in the game. The Air Component Commander and his staff work directly for the war-fighting CINC (Commander in Chief) in the theater.

The Campaign in the game is set up with a similar structure. The ATO (Air Tasking Order) is called the frag (for "fragment"), which is an enormous document that covers every Air Force and Navy aircraft in an entire theater of war. Your squadron gets its piece of the air war assigned via the frag. The mission schedule represents the "fragment" of the ATO that is being assigned to your squadron in the form of your mission schedule. You can fly several sorties a day and the campaign can last for many days. Although you are one of many hundreds of pilots flying in this war, your success or failure will affect the outcome of larger strategic situations. It's time to take your flying seriously and put your training to work.

Jumping Into the Campaign

If you are ready to join the battle and fly now, you can accept the default campaign settings and jump in. To join the campaign quickly, follow these steps:

- Click on Campaign at the main menu.

- Click on one of the three campaign scenarios, and choose an airbase on the map and the squadron listed above it.

Scenario Overview

The Scenario Overview part of the Preliminary Campaign window provides an overview of the scenario you're about to enter. Four areas provide information on ratings and strength:

SITUATION: provides an overall sense of the situation in one of five categories: Bleak, Poor, Fluid, Good and Excellent.

CHALLENGE RATING: provides four settings that influence the power of the enemy in the campaign. The overall Challenge Rating changes based on the force composition levels. You can adjust these levels by using the slider bars at the bottom. The slider bars represent the ratio of force levels between Enemy forces on the left and Friendly allied forces on the right. Slide the scale to one side and you tilt the ratio of forces in one side's favor, increasing the need for you to be an ace pilot or giving you some room to breathe if you're still a recruit. You are not reducing forces to zero but providing more forces for the enemy and thus increasing the difficulty. The Pilot Skill setting and the ADA (Air Defense Artillery) Skill setting can also be adjusted; these settings determine the quality of the enemy. Once the campaign begins, the force ratios are locked and cannot be changed.

SQUADRON SPECIALITY: describes the makeup of the majority of F-16 missions in the campaign. Some squadrons are primarily tasked with air-to-air missions and some with air-to-ground missions. If you mainly want to move mud, for example, select a squadron that specializes in air-to-ground missions.

SQUADRON STRENGTH: displays the number of aircraft in the squadron. Below the strength is a description of the current situation.

PATCH displays the squadron selected for the campaign (not the virtual squadron selected in the Logbook).

After you've adjusted these levels, click on the COMMIT icon in the lower right corner to continue to the Campaign's main screen.

The Scenarios

The campaign selection area in the top left of the screen allows you to start one of three battle scenarios or load a saved campaign. *Falcon 4.0: Allied Force* provides three possible, fictional scenarios in the Balkans conflict:

Balkans: Operation Powder keg

April 1995, and the civil war in the Former Republic of Yugoslavia has been raging since 1991. The main aggressor appears to be Serbia which is trying to control as much of the region as possible, claiming it is reuniting the fractured Yugoslav Republic. So far, the Croatian and Bosnian forces are holding their Serbian counterparts just inside their own borders following an earlier repulsed invasion attempt. Serbia has reacted to their retreat with a "scorched earth" policy; emptying the area of remaining civilians and homes. NATO has moved its forces into Italy on a "high alert" status to carry out any UN/NATO mandates.

Following investigations into war atrocities, NATO has acted to try to bring the conflict to a close and prevent further aggression. The UN has agreed to the removal or capture of the Serbian leadership. This means rolling the Serbian forces back and capturing Beograd (Belgrade). Support has been strong from neighboring countries which now fear they will be next target. Russia, however, has strongly opposed this strategy in the UN. Intelligence suggests Russia has been assisting Serbia militarily, contrary to the terms of a UN embargo.

In Operation Powder keg, most allied flights will originate in Italy and refuel over the Adriatic. These missions will be in support of NATO-bolstered forces advancing into Serbia. Squadrons may be relocated in the region if considered tactically important. Intelligence suggests that Serbian forces are expecting this move. Their Integrated Air Defenses are fully operational following attacks by the Croatian Airforce, illustrating that Serbia may not be as badly equipped as first thought.

Balkans: Operation Balance of Power

May 1996, and Serbia has broken the Dayton peace accord between the various parties in the civil war following the break-up of Yugoslavia. In a lightning strike, they have managed to overwhelm Croatia and Bosnia and are now consolidating their position. Intense diplomatic moves to persuade Serbia to withdraw have failed. More alarmingly, troops and armor are massing near the Slovenian border. NATO has decided to answer the pleas of the Croats and Bosnians. Following a request from the Slovenian government, NATO is preparing to restore the situation which existed when the peace accord was signed.

In this campaign, most F-16 missions will be to directly help NATO forces in the region, particularly with the suppression of Serbia's IADS. Other aircraft will provide specialist strike and air cover. AWACS and tanker flights are operating over the Adriatic to support NATO aircraft. Two US carrier groups are also stationed there.

Balkans: Operation under Siege

Intelligence suggests that Serbia has invaded the neighboring country of Albania after a build-up of forces along its border. The Serb leadership claims Albania has

been sponsoring the Kosovo Liberation Army and the only way they can prevent further troubles is to annex Albania. Albania has called on NATO to help.

NATO has decided that Serbia's policy of systematic and often brutal clearance of civilians from captured territory cannot be tolerated. The orders are to repel the invasion and push the Serbian forces back from the borders for twenty miles. It is hoped that this will provide a buffer zone against further possible aggression. However, Russia hasn't endorsed NATO's actions. It considers Serbia's invasion of Albania as legitimate self-defense. Russia also believes that Albania's annexation will help stabilize the region. Tensions in the UN are high. Russia says it may send aid to Serbia, even if that means openly opposing NATO forces in the region.

And the fictional scenarios in the Korean theater of operations:

Korea: Operation Tiger Spirit

North Korea, weakened from years of isolation and a decaying economy, makes an attack on South Korea, but quickly finds itself in trouble. The assault is quickly repulsed, but the pressure remains as the combined allied forces decide to push North Korea back and keep its forces from reorganizing.

Korea: Operation Rolling Fire

With a failing economy and a vast million-man army poised for battle at the border, North Korea is hungry for conquest. War has just begun. North and South Korea are evenly balanced and the bubble has finally burst.

Korea: Operation Iron Fortress

North Korea makes a bold, lightning strike into the south, overwhelming South Korea with a combination of surprise and the fierceness of its attack. It has the advantage and South Korea, along with its allies, is pushed into a serious defensive position. In days North Korea could break through the Pusan perimeter. The situation is desperate. It is up to the allies, and in particular U.S. air power, to hold the line and slow down the North Korean onslaught.

Choose one of these conflicts by clicking on the picture for the conflict. You can also load a previously saved conflict.

Priorities
When you start a new campaign, you are presented with a window for adjusting the Campaign's Priorities. If you want to start quickly, simply accept the default values and go straight to the mission schedule screen. You cannot change the ATO by changing these mission priorities. The Air Command will still find the best assets, which may or may not include your squadron, to achieve its goals.

Here's what the various priority values do:
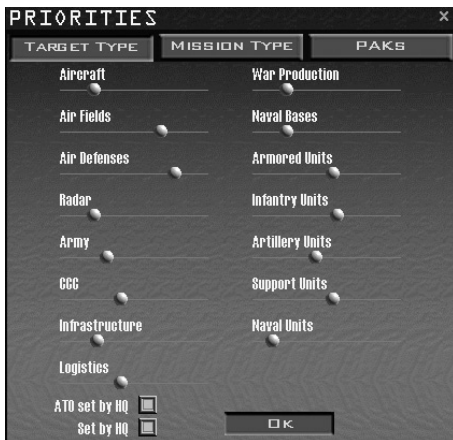
"TARGET TYPE":

These sliders adjust the priority the campaign engine gives to generating missions to target those areas. For example, if the first slider under aircraft was far to the right, the campaign would generate more missions against enemy aircraft, such as SWEEP and BARCAP. More about these later.

If the "Set by HQ" button on the Priorities dialog box is green, the Campaign engine sets your squadron's priorities automatically. As soon as you make any changes using the sliding bars, this button will automatically be deselected. If you make changes but then want to return to the original settings, simply click on the "Set by HQ" button again to restore all the original settings.

"MISSION TYPE":

Here you can change the frequency of a type of mission generated by the campaign engine. For example, if you wanted the campaign engine to place emphasis on missions to destroy enemy surface to air missile sites, you simply move this slider more to the right. Be careful though: by placing a greater emphasis on one mission over another, you invariably reduce the frequency of other missions. That might leave you dangerously exposed in a war scenario!
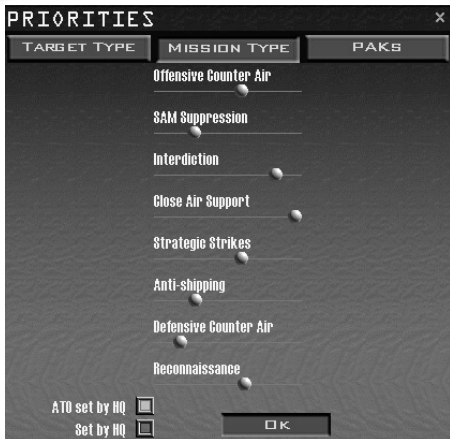
"PAKs":

The battlefield is divided up into zones. Adjusting the slider here allows you to concentrate missions in a particular area. For example, if you had a troublesome concentration of enemy ground units in one particular zone, simply highlight that zone by clicking on it and move the PAK slider to "High". More missions would then be created to operate in this particular area. Click "OK" to go to the Mission Schedule screen.

Mission Schedule

As the Mission Schedule screen loads, the Campaign fills in the Mission Schedule window with missions you can fly. You can select any mission in the Mission Schedule but since you can only fly one at a time, missions that you do not fly are flown by the computer. As the Mission Schedule screen loads, it creates a number of missions available to your squadron. When the missions appear, the campaign begins and the clock starts ticking.

The Frag Order for your squadron lists all the missions being flown by your F-16 squadron over the next few hours. The missions are listed chronologically by default, but you can reorganize the list by mission priority (P), takeoff time, mission type (Role), package and mission status. Simply click on one of these tabs. When a new campaign starts and each time you return to this screen, the game selects one of the first missions on this list and places you in the lead aircraft by default.

Scroll through the Frag Order and select any mission on the list that you want to fly. Information for this mission will appear below the Frag Order and also as a flight plan in the Planning Map. Keep in mind that you can only join missions that are in briefing or en route. As the war progresses, all missions will be flown and take off at their designated times.

You will automatically be placed in the lead aircraft of one of the first generated missions. If you want to choose a different mission, click on any mission in the

Mission Schedule and choose your plane in that mission. You can choose from air-to-air, air-to-ground, recon and other types of missions. For a detailed list of missions available to the F-16 and an explanation of Air Force acronyms used in missions, check out the section "Aircraft Mission Roles" in Chapter 11: Tactical Engagement.

Choose your plane in the flight by clicking on the aircraft of your choice below the mission list. The #1 aircraft is always the flight lead. Note your flight callsign. The name is to the left of the colon that precedes the mission descriptions above the aircraft. Flights normally consist of either two or four aircraft. The #2 position is the flight lead's wingman. The #3 position is the lead of the second element, and the #4 position is #3's wingman. #1 is still the overall leader of the flight.

Click on the Briefing icon on the bottom of the screen to review your chosen mission. Review the mission objective labeled "Your Task." Next, scroll down the mission briefing and note your weapons loadout and steerpoint information. Close this window when you're finished by clicking on the "X" in the upper right-hand corner or the "Close" button at the bottom.

Examine the area through which you will be flying on the Mission Map in the bottom right corner. Review the loadout of your aircraft and the entire flight by clicking on the Munitions icon. If your mission is in flight, you will not be able to change the munitions or flight plan.

Click on the Fly icon in the bottom right corner. If your flight has already taken off, you can jump into your airplane anywhere along the route to the target as long as

the flight has not yet reached the ingress point. Look at the Planning Map to see if the flight is approaching, but not past, the IP (Initial Point) marker on the flight path. The IP marker is a square steerpoint marker. If the plane is anywhere before this point, you can enter the flight.

If you have selected a flight that has not yet taken off, a countdown screen appears when you click the Fly icon. It displays a digital countdown timer and three ground starting point options: Ramp, Taxi and Takeoff.

Click on "Ramp" if you want to do the whole enchilada including startup, click on Taxi if you'd like to be on the taxiway or you need some extra time to set up. Select Takeoff if you'd rather be positioned for takeoff when you enter the cockpit.

At this "countdown" screen, the game speeds up the clock to your selected mission departure time. You will hear a number of pilots, air traffic controllers, and AWACS personnel communicating over communication channels and flying sorties as the game conducts the war. Hundreds of sorties, ground troops and skirmishes are taking place as you approach your taxi time.

When the countdown clock reaches zero, the simulation will load. As the simulation is loading, you will see a preflight screen. Then you will appear, depending on your selection, on the taxiway or runway cleared for takeoff. Your mission has begun.

Saving Your Campaign

After you choose a campaign and enter the Mission Schedule screen, you can save the campaign by clicking on Save on the left side of the screen. Simply give the currently running campaign a name and click on the Save button.

The Campaign also has an automatic save feature that automatically saves the state of the campaign at three different points:

- When you click on the Fly icon to enter the simulation

- When you press ESC in the simulation and select "End Mission"

- When you click the Back button to return to the main menu

The game creates an auto save file named "Auto Save." You can rename this file by clicking on the Save button. If you press ESC and discard the mission, you will return to the point in campaign time when you clicked the Fly icon to fly the mission you just ended. In this case, the campaign will not be saved.

Loading Saved Campaigns

If you've previously saved a campaign, load it by clicking on the Saved tab and selecting the campaign you want to load. Now click the Commit icon in the bottom right corner and the saved campaign will start.

If you relied on Auto Save to save your campaign or mission, click on "Auto Save" in the Saved window and then click on the Fly icon. The campaign will pick up where you left off when you previously exited the Mission Schedule window. For information on joining or hosting an online campaign, see Chapter 15:Multiplayer.

Theater Map

The Theater Map in the lower right corner of the Preliminary Campaign screen displays the relative positions of enemy and ground forces, the available F-16 airbases, the current time and day of the war, and the squadrons based at each airbase. Select the airbase from which you'd like to fly by clicking on the airbase icon. Then choose a squadron to the left of the Theater Map.

Note: if you select an AWACS squadron, then when committing you will be given an AWACS view of the theater where you can watch the action, but can't fly a mission.

"Airbases"

Note that the game will automatically assign you to an airbase if you forget to select one. If you select an airbase, you may still reassign to another airbase when you enter the Main Campaign screen. This happens when an airbase has fallen under attack, your squadron has run out of aircraft or your airbase becomes too close to the front lines. A pop-up dialog box will appear on the Main Campaign screen informing you of redeployment to a new airbase if this occurs.

Mission Schedule Screen

The Mission Schedule screen consists of three areas that help you prepare for a mission:

Mission Schedule

The Mission Schedule shows every mission available to your squadron. You can organize the missions by priority, takeoff time, package number, status and type. Click on one of the priority tabs along the top of the Mission Schedule. Click on the mission you'd like to fly. The Event Map in the upper right corner is a map of the selected Theater of Operations showing the current battle situation, recent high activity and communiqués. The clock displays the number of days in the current campaign as well as the time of day.

The Planning Map is a complete tactical view of the conflict. Move your mouse over the map; when the cursor appears, right-click on the map to display airbases, objectives, flight plans, ground troops, air defenses and other important military information.

Event Map

The Event Map shows hotspots developing in the Korean conflict on the map. As skirmishes erupt and die out, communiqués from JSTARS (Joint Surveillance Target Attack Radar System) and HQ (Headquarters) flash by on the text area next to the map. The clock at the top of the Event Map can be changed from Stop to 64 times normal time. The war rages continuously until one side has an overwhelming advantage or by political means, when both sides agree to a stalemate. This timeframe can vary from one day to many weeks.

News Reports

Whenever a major event occurs in the campaign, a video of a news report will play. Once one of these news reports is aired, a "News Reports" button will appear in the Event Map area. Click this button to access all previous news reports in the campaign. Reports are listed by date and time.

Adjusting the Campaign Clock

All campaigns start on Day 1. The clock advances normally as the campaign proceeds. If you're not ready to jump into battle but would rather see how a campaign is developing, you can speed up the clock 2, 4, 8, 16, 32 or 64 times. If you speed up the clock, missions will take off quickly so watch the clock closely to ensure you don't miss out on your mission.

If you need some time to check out the latest enemy intelligence, review your briefing for a mission or change a weapons loadout, you can also stop time completely by selecting "Stop" from the clock's drop-down list.

To change time in the simulation, press CAPSLOCK to toggle acceleration mode. You will see "x2" flashing in red on screen. Press SHIFT+CAPSLOCK to further increase acceleration, CTRL+CAPSLOCK to decrease. Of course you can also press P to pause or SHIFT-P to freeze the game.

Planning Map

After you select a mission, its flight plan appears on the Planning Map. This is an invaluable tool for planning and adjusting your mission. The Planning Map includes a wide variety of information and tools for viewing your flight plan and making changes to your mission.

"Maximize"

Press the Maximize button at the upper right edge of the small Planning Map to enlarge it to fill the screen. In the same column of buttons, the lower two ones are used to display the planned altitudes of the mission's flight plan.

Linear Altitude Plot

This item displays a side view of the selected mission's flight plan. This view shows the altitude your flight will fly between each steerpoint.

Log Altitude Plot

This side view is a larger scale version of the linear plot view and is another way to alter your altitude changes for the flight plan.

Zoom In

Click the "zoom out" button ("-") to zoom out on the map. Alternatively you can also use the mouse wheel when the cursor is hovering over the map.

Zoom Out

Click the "zoom in" button ("+") to zoom in on the map. Alternatively use he mouse wheel.

Fit Flight Plan

Click the Fit Flight Plan button below the "zoom in" button to reposition the map with the currently selected mission's flight plan.

The Planning Map Menu

With the Planning Map enlarged, right-click on the map. A pop-up menu will appear with options for display overlays to show you the complete tactical situation into which you'll be flying. Keep in mind that enemy intelligence is based on imperfect information. The fog of war applies to the game's campaigns as much as an actual conflict.

Options you can display include:

Recon provides strategic information and a 3-D view of a specific target or location on the terrain. Right-click on the area of interest and choose "Recon" from the drop-down menu.

The Recon window will open and provide zoom, pan and rotate buttons to examine the area or target you chose. In addition, a Target List window will appear below.

This window lists all the targets in the vicinity along with their condition and value. Click on the "+" sign to expand the target list.

Installations displays air fields, air defenses, political installations (such as cities, towns and bridges) and more. You can select as many of these installations as you want by clicking on each option. These selections will display for both Red and Blue units.

<u>Air Units</u> places squadrons, fighters, attack aircraft, bombers, support aircraft (troop and cargo carriers) and helicopters on the map.

<u>Ground Units</u> displays ground units including divisions, brigades, battalions, combat divisions, air defenses and support for both sides.

<u>Naval Units</u> displays combat and supply shipping.

<u>Show Packages</u> displays all packages currently en route to their designated targets.

<u>Threat Circles</u> let you display radar and ADA (Air Defense Artillery) threat areas on the map. This will allow you to see if your flight plan takes you within known SAMs or AAA (low- or high-altitude) or low- or high-altitude radar coverage. Low altitude represents radar coverage taken at about 5,000 feet; high-altitude radar represents radar coverage area at about 20,000 feet.

<u>Names</u> toggles object names on the map. Any object that has been selected for display with other menu items can also have its name displayed. If Names is turned off, you can still see an object's map label by placing the cursor over the object for a second.

<u>Bulls-eye</u> toggles displaying the bulls-eye overlaid on the map. Bulls-eye is a common reference point used to specify locations. For more information, see the "Bulls-eye" section.

<u>FLOT Line</u> shows the current front line where the heat of the ground battle happens.

Using Intelligence

The Mission Briefing window in the Mission Schedule screen and the Intel screen helps you check your mission briefing and enemy intelligence. This is the logical next step after you've reviewed the Planning Map for the selected mission.

Mission Briefing

Click on the Briefing icon to access your mission briefing. This document contains detailed information about the mission, including:

Mission Overview lists the mission name, the specific task (e.g., SEAD Strike) and the TOT (Time Over Target).

SITUATION illustrates the current battlefield situation that calls for your mission.

PACKAGE ELEMENTS lists all the flights in your package and their callsigns. This information helps you understand all the pieces involved in the mission at hand. Your flight is also highlighted to call it out from the others.

THREAT ANALYSIS warns of threats you are likely to encounter, based on the most recent intelligence.

STEERPOINTS allows you to review your entire flight plan at a glance. Each steerpoint is listed by number along with an action for that steerpoint, such as the time of arrival, heading, speed, altitude and en route instructions.

ORDNANCE displays the full ordnance loadouts for each aircraft in your package. You can review what everyone is carrying and decide if your own weapons load is appropriate for your mission. The Munitions window allows you to change loadouts for your flight only. See the section "Munitions Window" later in this chapter.

WEATHER lists the predicted weather conditions for your mission, including wind, temperature, cloud information and the contrail layer.

RULES OF ENGAGEMENT describes the strict rules you are required to obey regarding any engagement with the enemy to protect yourself and your allies.

Press the "CLOSE" button to get back to the Mission Schedule screen.

ATO

The ATO (Air Tasking Order) window that you can open up from the Mission Schedule view allows you to see all aircraft tasked in the entire theater of operations. Your route stays on the planning map in white. Click on "Show all packages" on the bottom of the ATO window to see all the friendly packages in the air campaign. Click on the "+" sign next to the mission you want to view or package number.
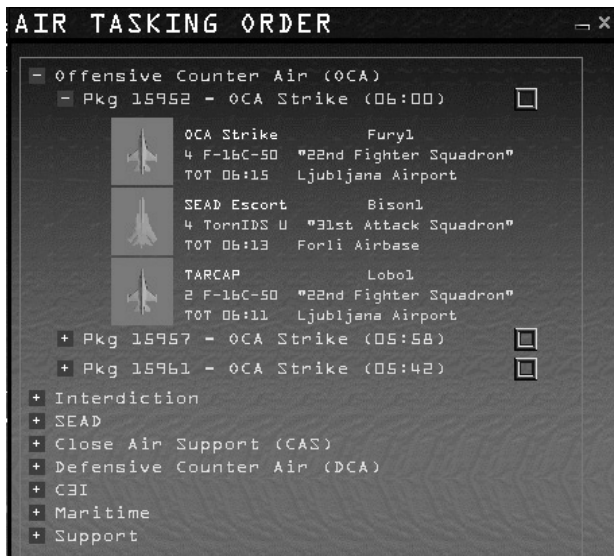
All flights will appear listing aircraft icons, callsigns, unit numbers and bases. Click on the button to the right of the package number to view the route of flight for a selected package. Steerpoints for the flight plan will turn blue. By viewing the packages, you can see the extraordinary scope of the air war.

OOB

The Order of Battle is a list of armed forces by type, strength and location for the various elements of Blue and Red forces. Click on the flag of the desired country across the top of the window to see its assets. When you highlight a flag icon, you see the information for the selected country. Clicking the same flag icon again removes the information for the respective country from the list.

Click the "+" sign next to a category to view all of its squadrons and airbases for different branches of the military.

For each major power, you can examine force levels of their air force, army or navy, as well as details of that country's objectives. In the example above, we're looking at the force levels for NATO Air assets in the Balkans Balance of Power Campaign. We can see that at Amendola Airport in Italy, there is a squadron of 18 F-16 aircraft, operating at 100% strength. At Asiago, there's a squadron of four KC-10 tankers.

You can right-click on a unit and view the Recon Window or its status. Click the unit and then the Find button to center that unit's icon on the map and highlight it. The Status button calls up squadron info for squadrons and status info for everything else on the map. As each country has its own flag, it has a unique insignia (plane markings on the aircraft).

The Intel Screen

When you click the Intel menu item on the left side, the Mission Schedule screen is replaced with an Intel screen, which provides an overview of the situation as well as details about the relative strength of friendly and enemy forces.

The blue (friendly) and red (enemy) fields encompass four bar graphs that show the relative strengths of different asset types. The blue bars represent the strength relative to resource quantity (not quality) of Allied forces, and the red bars represent Enemy forces. To get a quick overview of the status of the war, select an asset for each bar group. Click on the headings of each group and choose the asset you want information about.

At the bottom of the Intel display area is a scrolling list of updates from the war that is raging as you plan your next mission. This list is updated in real time with the latest items appearing at the top of the list.
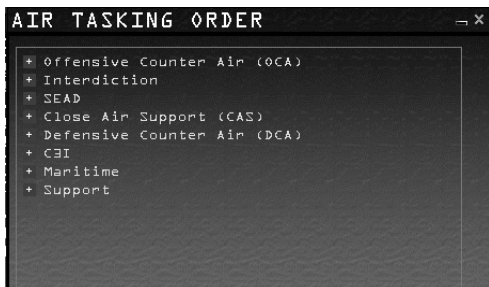
Force Levels
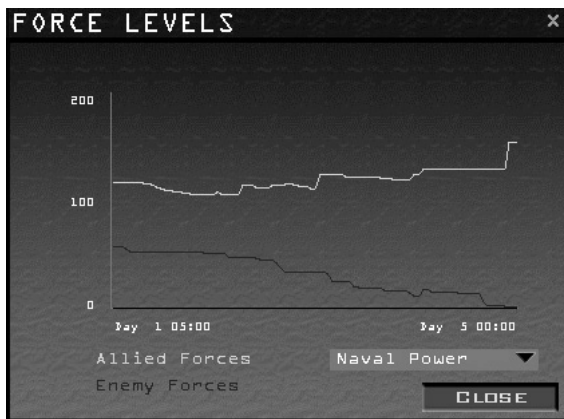
The Force Levels window provides an overview of each country's air defenses, naval power, supply, fuel, airbases, aircraft and ground vehicles. Force levels are available for Red and the Blue. Allied countries are grouped together.
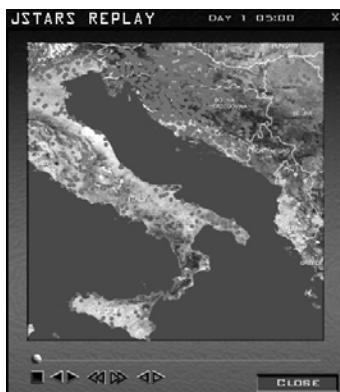
Fighter Squadron

```
FIGHTER SQUADRON                    ✕
                22nd Fighter Squadron

Unit Type    F-16C-50
Owner        NATO
Base         Ljubljana Airport
Role         Air-to-ground
             Aircraft            18
             Pilots              48
             Experience          Regulars
             Morale              High
             Supply              Critical
             Next Resupply       12:00
Players:     Last Resupply       0   Aircraft
   1         Aircraft Losses     0
             Pilot Losses        0
             Missions Flown      1
             Mission Rating      Excellent
             A-A Kills           0
             A-G Kills           0
             Naval Kills         0
             Stationary Targets  0
                  FIND        CLOSE
```

Press this button to display the records for your squadron. The top part of the window lists the type and name of the squadron. It also indicates where it is based and its role. The bottom of the window alternately displays detailed squadron information or pilot information.

Click the Squadron button to see squadron information. This window includes detailed information on your squadron, including battle statistics and pilot status. Click on the Pilots button to access career totals for each pilot in the squadron. This window also displays the number of kills and mission ratings.

Sierra Hotel

Sierra Hotel is where the Sh*t Hot pilots get their proper recognition. The top pilot (the ace of the base) is shown at the top of the list. The rest of the pilots are displayed in a scrolling list, in order of air-to-air kills.

Mission planning

After reviewing your mission and briefing, you may need to make changes to your flight plan. Comprehensive mission planning tools are part of the Planning Map and the Flight Plan windows. When you select a mission, its flight plan appears on the Planning Map. All route and flight parameters are automatically calculated. You can change these parameters, however, using the menus described below.

Steerpoint Modification Menu

Return to the Mission Schedule screen by clicking on Mission Schedule on the left side of the screen. After you expand the Planning Map, right-click on a steerpoint to bring up a new menu that lets you modify your flight plan. Use the Planning Map to change or lock any of the following elements of a steerpoint:
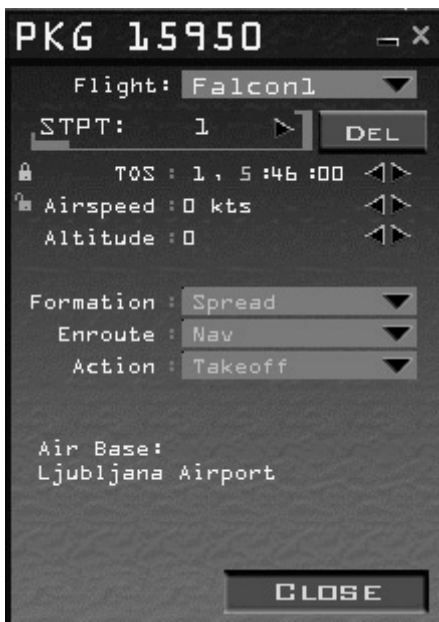
Recon: Provides strategic information and a 3-D view of a specific target or location on the terrain. In addition, the Target List window appears.

Lock Time: Locks the TOS (Time Over Steerpoint) so that it cannot be changed if you change the position or speed of this or other steerpoints. If TOS is locked and you change the position of the steerpoint, the airspeed will be adjusted to allow TOS on the locked steerpoint to remain the same.

Lock Airspeed: Locks the airspeed so that it isn't modified if you change the position or time of the steerpoint. If airspeed is locked and you move the position of the steerpoint, the TOS setting is adjusted accordingly.

Climb Mode: Lets you select between immediate and delayed climb modes. Immediate tries to get to the altitude set for the current steerpoint immediately. Delayed will wait until the last minute before starting your climb or descent.

Formation: Used primarily for your AI-controlled wingmen. Select from Spread, Wedge, Ladder, Stack, Trail, Res Cell, Box or Arrowhead. See the full manual on the CD-ROM for more information on formations.

En route Actions: Actions you can specify en route to the selected steerpoint. See "Setting En route Actions" in the Flight Plan section below for details.

Action: Allows you to set the action at the selected steerpoint. See "Setting Actions" in the Flight Plan section below for details.

Delete: Deletes the currently selected steerpoint.

Flight Plan

Click on the Flight Plan icon at the bottom of the Mission Schedule screen to access the Flight Plan window. You can also display this by left-clicking on any of your steerpoints on the planning map. The Flight Plan window is labeled with the number of your flight package and provides the following options:

Flight List selects the flight you want to modify. If more than one flight is part of your package, you can select and change the route parameters for the other flights in your package.

Setting Steerpoints enables you to change any steerpoint. Use the arrows to cycle through the steerpoint numbers. For each steerpoint, you can change the values of the TOS, the airspeed, the altitude, formation, the en route action, and general action.

Setting TOS helps you coordinate various components of your package by ensuring that all the important pieces will be in the right place at the right time. To set the TOS, click on the hours, minutes or seconds field (it will turn green to show it's selected). Use the arrows to adjust the time. Setting the TOS automatically locks it and turns the lock icon green. To unlock or relock the TOS, click on the lock icon next to TOS. When the lock is green and closed, the TOS is locked; when the lock is blue and opened, it is unlocked.

Setting Airspeed allows you to set the airspeed for each steerpoint by clicking the arrows. You can change airspeed in increments of 5 knots. Setting airspeed automatically locks airspeed. Check the full manual on the CD-ROM for more information on adjusting TOS and airspeed for an entire package.

Setting Altitude allows you to set the altitude for the steerpoint.

Setting Climb/Descent allows you to choose whether the climb out to the next steerpoint is immediate or delayed. Select Delayed to remain at the last steerpoint's altitude until just before arriving at the next steerpoint. Select Immediate to climb to the current altitude immediately on arriving at the steerpoint.

Setting Formation tells your wingmen to fly a particular formation. Choose from Spread, Wedge, Ladder, Stack, Trail, Res Cell, Box or Arrowhead. See the full manual for descriptions of these formations.

Setting En route Action sets the actions of your wingmen or the other flights in your package while en route to a specific steerpoint. Only the available actions will appear in this list. Additional actions are possible for other packages and missions depending on the aircraft type and mission.

Setting Action sets the action of your wingmen or the other flights in your package when they reach a steerpoint. Only the available actions will appear in this list. Many more actions are possible for other packages and missions depending on the aircraft type and mission.

Steerpoint Info displays pertinent information for a particular steerpoint. For example, if the steerpoint is a Takeoff or Land steerpoint, the name of the airbase will appear in this area. When you're displaying the target steerpoint, the Flight Plan window displays a new button labeled Assign at the bottom of the window. Click on the Assign button to access a target list to assign specific targets to the selected flight. The Target List window includes a list of individual targets that you can examine using the Recon feature described earlier.

Munitions Window
If you want to check the munitions loadout for the selected flight, click the Munitions icon in the lower right corner. Each option available in the Munitions window is briefly explained below.

Aircraft Tabs: At the top of the Munitions window are up to four tabs, which represent each aircraft in your flight. You can make changes to any or all of the aircraft at the same time. All aircraft are initially selected. If you don't want to change the loadout of a given aircraft, click its tab so that it is not selected. When selected, the tab shows the pilot name green on a greyish button. When deselected, the name is displayed white on a black background. Changes apply only to the selected aircraft.

3-D Model: A 3-D representation of the aircraft that is being loaded appears in the top half of the window. This model can be rotated and zoomed with the controls to the left.

Aircraft Statistics: The Munitions window dynamically calculates the current loadout weight and drag index of munitions attached to the aircraft. Weight and drag are important factors in all missions because they dramatically affect an F-16's flight characteristics and turning ability. Statistics are available for max weight, gross weight, clean weight, munitions, fuel and drag factor.

For detailed information on using the Munitions window, see the full manual on the CD-ROM. To learn more about different weapons, see Tactical Reference in the game.

Munitions Options and Buttons
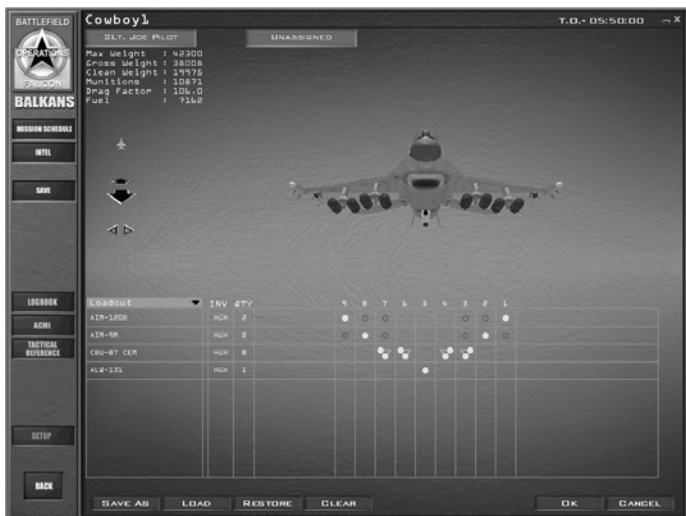
The Munitions screen includes features for selecting, saving, loading and restoring different loadouts. Remember that you cannot change the loadout of any aircraft in flight.

The Loadout List and Inventory lets you select one of the following lists of munitions: Loadout, Air-to-Air, Air-to-Ground, Other (fuel tanks and cameras) and All (your entire weapons inventory available for your aircraft's hard points). Your inventory can be High, Medium, Low or Out.

The Munitions Scroll Bar allows you to scroll through munitions available for your squadron. Use the scroll bar after selecting the desired category of munitions from the Munitions list.

SAVE AS saves the current weapon loadout. Use this button to save a custom loadout. You can save as many options as you'd like and name them.

LOAD a saved loadout. When the dialog box opens, highlight the desired loadout by clicking on it in the window. Then click on Load. To load a specific loadout for each squadron pilot, make sure you have only the desired pilot selected in the aircraft tabs at the top of the window before clicking on the Load button.

RESTORE a modified loadout. If you modify a loadout but then decide the default (computer-selected) loadout is better, click on Restore. Remember that after you

modify a loadout and click on OK, you cannot use Restore to bring back the computer-selected loadout.

CLEAR completely removes a loadout from the selected pilot. With a clean slate, you can begin building your preferred loadout.

OK accepts the current loadout shown onscreen. This includes any modifications you've made to the default loadout.

CANCEL any changes you've made to your loadout or your squadron during this visit to the Loadout window.

Note: Consider saving the original loadout prior to modification by clicking on the Save As button. This will help later when you'd like to return to the computer-configured loadout.

Entering the Mission

The Campaign runs, of course, in real time. The Event Map on the Mission Schedule screen includes a clock that shows the mission time and the number of days you are into the Campaign. The clock initially starts on "day 1" and then runs in real time. When you select a mission, its takeoff time may be much later than the time listed on the Campaign clock. Use the time before a mission to study your briefing, flight plan and the intel situation.

If you are ready to fly, you can speed up time in one of two ways:

Click on the clock's drop-down list and select from 2 to 64 times the clock rate. You can also stop time using this drop-down list if your flight is soon and you want more time to study the situation.

Click the Fly button in the lower right of the screen. If the Campaign time is not equal to the time of your flight, the sim will accelerate time as quickly as possible to bring you to your flight time.

Ramp, Taxi and Takeoff

If you click on the Fly icon before takeoff time, you can choose to appear either at the ramp, on the taxiway or on the runway ready for takeoff.

If you choose **RAMP**, when the mission loads, you will need to start the aircraft and then taxi to the runway. Note that you will need about 25 minutes from flicking the first switch to takeoff. Of course you can also use acceleration when needed.

If you chose **TAXI**, when the mission loads, you will need to get clearance to taxi. Press "TAB" (the main comms key), then "5" (tower) and "6" (request taxi).

If you chose **TAKE OFF**, you will enter the simulation on the runway, cleared for takeoff.

Scramble

If attacking aircraft are approaching your airbase while you are briefing or debriefing, a special dialog box appears asking if you want to accept this Scramble mission. If you want to accept this mission, click the Intercept button and you will return to the Mission Schedule window, with you being placed automatically in the intercept flight's lead aircraft slot. Don't waste time here: you've got less than a minute to get into the air and stop aircraft from destroying your airbase.

Saving a Campaign

After you choose a campaign and enter the Mission Schedule window, you can save the campaign by clicking on Save on the left side of the screen. Simply give the currently running campaign a name and click on the Save button.

If you want to access a saved campaign at a later time, simply click on the Saved tab at the top of the Preliminary Campaign window and then click on the campaign you'd like to load. Press the Commit icon in the bottom right corner, and the saved campaign will load.

Auto Save

The Campaign also has an automatic save feature that automatically saves the state of the campaign at three different points:

- When you click on the Fly icon to enter the simulation

- When you press ESC in the simulation and select "End Mission"

- When you click the Back button to return to the main menu the game creates an auto save file named "Auto Save." You can rename this file by clicking on the Save button.

If you press ESC and discard the mission, you will return to the point in campaign time when you clicked the Fly icon to fly the mission you just ended. In this situation, the campaign will not be saved.

Aborting a Mission

If you need to abort a mission while in mid-flight, press ESC and either select End Mission or Discard Mission. When you press the End Mission option, a Debriefing window will appear with information about your flight. The campaign will record the success or failure of this mission when you decide to exit.

If you do poorly and want to scrub a mission, choose the Discard Mission option. The mission will end and you will be taken back to the Mission Schedule window. The Campaign computer will return you to the point in the campaign just before loading the mission you just aborted. If you need to exit the Campaign entirely, you can either save your mission using the Save menu item or back out by clicking on Back and have the game automatically save the campaign.

Ending a Mission

When you end a mission, either by being killed or by completing the mission, you will return to the Debrief screen, which lists your mission results and rating.

Debriefing

The Debriefing window appears after you exit the mission. The Debriefing window includes critical information on the following topics:

Your task and pilot rating lists whether the mission was successful, partially successful or a failure. This section also lists any losses incurred by your flight and your pilot rating.

Package statistics lists flight names, aircraft used and detailed comments in a drop-down list. This comments section is a log file that records significant events in the mission.

Flight statistics details ordnance used, by callsign. This section also lists the results of all ordnance used (by percentage of targets hit).

Pilot statistics lists statistics for each pilot, including callsign, aircraft type, pilot name, current status, air-to-air kills, air-to-ground kills and rating. Numbers in parentheses are attributed to the AI pilot (before you jumped into the plane).

Results tell you whether your mission was considered complete or not.

Winning and Losing a Campaign

To win a campaign, one of three conditions must be met:

- Capture of key cities

- Attrition of forces

- Diplomatic settlement

Winning a Campaign doesn't take hours, it takes days. So don't expect a final result too quickly! We hope that during the course of the Campaign you'll appreciate its depth and its challenge.

Chapter 15: Multiplayer

Somewhere along the way the moment will come: You have learned how to control the F-16, how to have it perform the way you want it to, you evaded SAMs, you evaded missiles, shot down enemy aircraft and destroyed enemy facilities. But now that is not enough anymore, you might want to measure your skills with other human pilots in a Dogfight, you might want to meet together with your friends and fly missions against the enemy. This is where the Multiplayer option of the game comes into play. What Multiplayer feels like can not be described with words, it needs to be experienced. Here we can only guide you through the steps necessary to set up a Multiplayer session.

Networking prerequisites

The game operates on specific networking ports that need to be enabled if a firewall is in place if you intend to run an Internet game. So in case you use a networking router it needs to be made sure that both ports 2934 and 2935 are forwarded to the PC that you want to join the Internet game with.

Entering the Multiplayer User Interface

On the main user interface, press the MULTIPLAYER button. From there you have two options - LAN (local area network) or Internet.
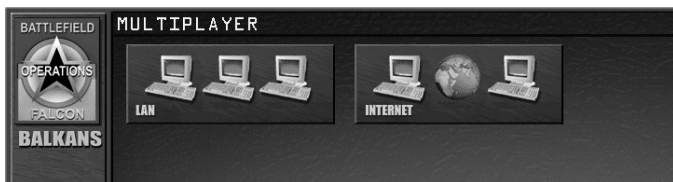
Creating Your Own Server

From either the Internet or LAN choice, you can choose to create a server. If you wish to password protect your server, turn on the checkbox next to the "Create" button on the bottom left.

NAME	MODE	PLAYERS	THEATER	IP
Server	Campaign	5/16	Balkans	192.168.0.17

After pressing Create, a dialogue will appear telling when the server is initialized and set up.

Choose a Campaign, Tactical Engagement or Dogfight to set up a server game. After committing in the main UI, you will be prompted with an additional screen. This is where you lay out the rules of engagement and where you can limit which options players who join your game can set.

- Game Name - what you want to call the game.

- Max # Players - if you wish to limit the number of players that can join the game specify it here.

Next there are a set of options which you can limit to a minimum and maximum. The left hand drop down is the minimum that the joinee can set, and the right hand drop down show the currently selected options for your own game. If any of the own option drop downs turn red you have selected an incompatible sequence.

- Flight Model - Simplified or Accurate.

- Avionics - Easy or Realistic

- Weapon Effects - Exaggerated, Enhanced or Accurate

- Autopilot - Combat, Steerpoint or 3-Axis

- Air Refueling - Easy, Simplified, or Realistic.

- Padlocking - Disabled, Enhanced or Realistic.

- Vehicle magnification - from x5 to x1.

If you are setting up a strict game, you may wish to set the left hand drop down options all to the maximum setting to limit the joiner's options.

Then there is a set of options that you can toggle on or off.

- Invulnerability

- Unlimited Fuel

- Unlimited Chaff & Flares

- No Collisions

- No Blackout

- Labels

- Disable Clouds

- Allow External Views

- Host Only - if selected this will create a pure server with no ability to fly. When joining a pure server, a client sees this option turned on by default.

Once you are happy with the conditions, select OK. You will then be onto the regular screen but now hosting the multiplayer session.

Connecting to Multiplayer

On the main user interface, press the MULTIPLAYER button for setting up a Multiplayer game. Connecting from there you have two choices. You can

- Search the local LAN for servers.

- Connect to a given server on the internet.

Connecting on a LAN

If you select the LAN option, the client will list the servers that are active on the LAN. Various details about each server will be displayed and you may choose one from the list. The depicted example shows a server that has a campaign running in

the Balkans Theater. Out of a maximum of 16 players, five players are already connected. Click on the listed server and then select the Join button to connect. You may also double click onto the server to join. Alternatively you can select Create to create a new server that other clients can then join. See the later section for how to proceed here.

Press Refresh if you want to renew the list of servers instantaneously. LAN Servers however send a heartbeat each five seconds that automatically updates the information in regular intervals.

After you have chosen a server to connect to, you will get the following dialog with a progress bar. In case the connection could not be established, this window informs you about possible reasons for failure. If the server is password protected, you will be prompted for the password during the connection process. Once completed dismiss the dialog with OK and proceed to the relevant section. In the example case, press the Campaign button on the main menu bar on the left.

At this point you will see the running game appear below the "Online" tab.
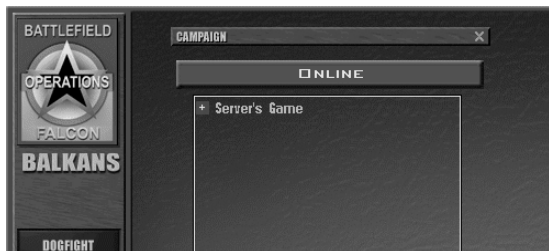
Selecting this entry by clicking on Server's Game will transfer a map of the theater and some status information. You can click on the + icon to see who is currently connected into that game.

Then press the Commit button to enter the online campaign. Alike when creating a server, you are now prompted with the Rules of Engagement settings screen (see Enter this address into the Custom Server Address line and press the Join button. Once successfully connected, this server is automatically added to the Internet servers list, but does not stay there indefinitely. After some amount of time servers are removed again when they have not been joined again. However, you can also mark a server as favorite server. For doing so, select the respective server in the list with the left mouse button. Then two new buttons appear at the bottom, Delete and Keep. Using the Keep button you mark a server as favorite. This server will not get removed from the list again until you delete it with the Delete button. For a visual cue, favorite servers are colored orange. Double clicking on a list entry with the right mouse button allows you to modify specific parameters.

Alike the LAN connection, a dialog will show the connection progress and you can dismiss the dialog pressing OK button.

Chat Dialog

You can click on Chat to bring up a Dialog to chat with the other members of the game.

In the left hand screen is the list of players. You can select one or more of these names and right click to bring up a menu.

From this you can choose several options:

- Mute - don't receive messages, but send messages to this player

- Ignore - neither send to nor receive messages from this player

- Logbook - show this players log book

- Find Player - locate information about the player's status in the game.

- Join Player - takes you to the player's flight.

Additionally, you can unselect a player by simply clicking on its name. This way, your messages won't be sent to this player, but you can still receive his.

When the chat window is closed, but you got a message incoming from another player, the Chat button on the left menu bar will be flashing

Disconnecting from Multiplayer

On most screens you will see a bright green MULTIPLAYER button telling you that you are online currently. If you want to disconnect from multiplayer, go back to the main user interface and press the red DISCONNECT button.

Troubleshooting Multiplayer connections

There are several reasons why a multiplayer connection might fail. The game can give you specific error messages to help you in the search for possible reasons. These error messages are displayed in the CommLink window.

If the server is running a different theatre than you, the game switches automatically to the BATTLEFIELDS user interface where you can change, as depicted in above example, to the standard Balkans Theater of Operations.

```
No Server answer - correct URL/IP ? All
required ports open ?
```

When no answer is received from the specified server, you will get these error messages, either for LAN or Internet mode. In case of an Internet game, the most common problem is that port forwarding is not properly configured. Make sure that ports 2934 and 2935 are routed to the correct machine.

```
Connection to Server lost during
initialization
```

In case connection to the server is lost during initialization, this error message is being displayed.

```
Can't connect - Server needs updating to
patch version '1.01'
```

Lastly, if you run a different patch version than the server, a message similar to the depicted one is displayed. For your convenience, it tells who runs an older patch version and thus needs to update.

Chapter 16: Credits

Many people have made this simulation what it is today.

It started out with the vision and attention of those at Spectrum Holobyte & Microprose, who worked for many years to bring the simulation to market. Some claimed they attempted too much, and that the product was late and rather buggy. However, the world of military simulation for the home computer market would have been considerably poorer without their considerable efforts and attention to detail.

After a year of support, the original Falcon team was disbanded and the development offices closed.

For several years, enthusiasts worked tirelessly enhancing the product to make it a more detailed simulation of the F-16 environment out of a love for the game and a driving desire to improve it. Many people spent a good deal of their life dedicated to this task.

To borrow a phrase from Isaac Newton, Lead Pursuit acknowledges that they have only been able to bring this version of the product to the public by "standing on the shoulders of the giants that went before them." To this end, we are ever grateful.

COCKPIT

Air brakes close	Ctrl B
Air brakes open	Shift B
Air brakes toggle	B
Air source decrease	Shift Ctrl F3
Air source increase	Shift Ctrl F4
Aircraft lights	Shift Alt L
ALOW altitude decrease	Alt ,
ALOW altitude increase	Alt . (period)
Alternate landing gear	Shift Ctrl Alt G
AVTR (Airborne Video Tape Recorder)	F
AVTR switch	Alt F
AVTR switch back	unassigned
Autopilot	A
Autopilot override	Ctrl 3
Autopilot switch left	Ctrl 1
Autopilot switch right	Ctrl 2
Aux comm AA/TR	Alt F6
Aux comm band X/Y	Alt F4
Aux comm center digit	Alt F2
Aux comm left digit	Alt F1
Aux comm right digit	Alt F3
Aux comm UFC/backup	Alt F5
CAT I/III	Shift C
Chaff and flare auto/manual	Alt Z
Deploy drag chute	Shift D
Dogfight override mode	D
Drop chaff	X
Drop flare	Z
Dump fuel	Alt D
ECM (Electronic Countermeasures)	J
Eject	Ctrl E
EPU (Emergency Power Unit) step	Alt E
F-ACK	Ctrl F
FCC (Fire Control Computer) sub-modes	' (apost)
Fuel door	Shift Ctrl R
Fuel external transfer	unassigned
Fuel master switch	Shift Ctrl F7
Fuel pump switch decrease	Shift Ctrl F5
Fuel pump switch increase	Shift Ctrl F6
Fuel switch decrease	Shift Ctrl F1
Fuel switch increase	Shift Ctrl F2
Gear horn silencer	Ctrl G
Ground jettison enable	Alt J
Hook deploy	Ctrl K
IFF (Identify Friend or Foe) master	unassigned
INS (Inertial Navigation System) decrease	Ctrl Alt F7

	INS increase	Ctrl Alt F8
	Instrument lights	Shift Ctrl L
	Jettison all	Ctrl J
	JFS (Jet Fuel Started) switch	Shift J
	Kneeboard page	Alt K
	Landing gear	G
	Landing gear down	Alt G
	Landing gear up	Shift G
	Landing light	Ctrl Alt L
	Laser arm	Alt L
	Manual pitch override	O
	Master Arm cycle	Shift Ctrl Alt M
	Master Arm on	Shift M
	Master Arm safe	Ctrl M
	Master Arm simulation	Alt M
	Master caution	Ctrl C
	MRM (Medium-Range Missile) override mode	M
	MRM/DF override cancel	C
	NVG (Night Vision Goggles)	N
	Open/close canopy	Shift Ctrl C
	Parking brake	Alt P
	Power data link	Shift Alt F11
	Power FCC (Fire Control Computer)	Shift Alt F6
	Power FCR (Fire Control Radar)	Shift Alt F5
	Power GPS (Global Positioning System)	Shift Alt F10
	Power HUD (Head-Up Display)	Shift Alt F2
	Power left hard point	Shift Alt F3
	Power main decrease	Ctrl Alt F1
	Power main increase	Ctrl Alt F2
	Power MAP (navigation map display)	Shift Alt F12
	Power MFD (Multi-Function Display)	Shift Alt F8
	Power right hard point	Shift Alt F4
	Power SMS (Stores Management System)	Shift Alt F7
	Power TISL (Target Identification Set Laser)	Shift Alt F1
	Power UFC (Up-Front Controls)	Shift Alt F9
	Radar altimeter off	Alt A
	Radar altimeter on	Shift A
	Radar altimeter standby	Ctrl A
	Reset alternate gear	Shift Ctrl G
	Seat arm (ejection seat)	Shift Ctrl E
	Steer point next	S
	Steer point previous	Shift S
	Terrain following radar	Shift Ctrl A
	UFC normal/backup	Alt F7
	VMS (Voice Message System) inhibit	Ctrl V
	Wheel brakes	K

COMMS

COMM1 volume down	Ctrl Alt [
COMM1 volume up	Ctrl Alt]
COMM2 volume down	Shift Ctrl Alt [
COMM2 volume up	Shift Ctrl Alt]

CONTROLS

Afterburner full	Ctrl =
Afterburner minimum	Ctrl -
Nose down	Shift Ctrl Down Arrow
Nose down	Shift Ctrl Up Arrow
Roll left	Shift Ctrl Left Arrow
Roll right	Shift Ctrl Right Arrow
Rudder left	, (comma)
Rudder right	. (period)
Throttle back (decrease)	-
Throttle forward (increase)	=
Throttle idle	Alt -
Throttle set idle detent	Alt L
Throttle step down	Shift -
Throttle step up	Shift =

EASY RADAR

Bore sight enemy	Shift R
Bore sight Friendly	Shift Y
Closest enemy	E
Closest friendly	T
Next enemy	R
Next friendly	Y
Previous enemy	Shift E
Previous friendly	Shift T

EWS (Electronic Warfare System)

Chaff power	Ctrl Alt F3
Flare power	Ctrl Alt F4
Jammer power	Ctrl Alt F5
EWS mode decrease	Shift Z
EWS mode increase	Shift X
PRGM (program) decrease	Shift Q
PRGM (program) increase	Shift W
RWR (Radar Warning receiver) power	Ctrl Alt F6

FLAPS

Decrease flaps	Ctrl F11
Decrease LE (Leading Edge) flaps	Alt F11
Increase flaps	Ctrl F12
Increase LE Flaps	Alt F12
LE flaps normal/extend	unassigned
Lock LE flaps	Ctrl 5
Set flaps to full	Ctrl F10
Set flaps to null	Ctrl F9
Set LE flaps to full	Alt F10
Set LE flaps to null	Alt F9

HOTAS (Hands-On Throttle and Stick)

Cursor enable	Shift N
DMS (Display Management Switch) down	Keypad Shift 2
DMS left	Keypad Shift 4
DMS right	Keypad Shift 6
DMS up	Keypad Shift 8
First trigger detent	Ctrl /
Pinky switch	Alt V
Second trigger detent	Alt /
TMS (Target Management Switch) down	Ctrl Down Arrow
TMS left	Ctrl Left Arrow
TMS right	Ctrl Right Arrow
TMS up	Ctrl Up Arrow

HSI (Horizontal Situation Indicator)

Course decrement	Ctrl Alt V
Course increment	Ctrl Alt B
Heading decrement	Ctrl Alt N
Heading increment	Ctrl Alt M
HSI Modes toggle	I

HUD (Heads-Up Display)

Altimeter type	Shift Ctrl Alt A
Brightness	Shift Ctrl Alt B
Brightness down	Shits Ctrl Alt Z
Brightness up	Shift Ctrl Alt X
Display DED (Data Entry Display)	Shift Ctrl Alt D
Display FLIR	Shift H
Heading scales	Shift Ctrl Alt S
HUD color	Shift Ctrl Alt C
Manual bomb reticle down	Ctrl [

	Manual bomb reticle up	Ctrl]
	Pitch ladder	Shift Ctrl Alt P
	Scale type	H
	Velocity cues	Shift Ctrl Alt V
	Warning reset	Shift Ctrl Alt W

ICP (Integrated Control Panel)

ICP 0 (M-SEL)	Keypad Ctrl 0
ICP 1 (ILS)	Keypad Ctrl 7
ICP 2 (ALOW)	Keypad Ctrl 8
ICP 3	Keypad Ctrl 9
ICP 4 (STPT)	Keypad Ctrl 4
ICP 5 (CRUS)	Keypad Ctrl 5
ICP 6 (TIME)	Keypad Ctrl 6
ICP 7 (MARK)	Keypad Ctrl 1
ICP 8 (FIX)	Keypad Ctrl 2
ICP 9 (A-CAL)	Keypad Ctrl 3
ICP AA	Keypad Shift 0
ICP AG	Keypad Shift . (period)
ICP COM1	Keypad Shift /
ICP COM2	Keypad Shift *
ICP DCS down	Ctrl End
ICP DCS return	Ctrl Insert
ICP DCS seq	Ctrl Page Up
ICP DCS up	Ctrl Home
ICP DLNK	Ctrl d
ICP drift C/O	Ctrl Page Down
IPC enter	Keypad Ctrl Enter
IPC IFF	Keypad Shift 7
ICP LIST	Keypad Shift 9
IPC NAV	Keypad Shift Enter
ICP next	Keypad Ctrl +
ICP previous	Keypad Ctrl -
Landing help toggle	Alt h

Left MFD

Brightness down	Ctrl Alt f
Brightness up	Ctrl Alt g
OSB 01	Ctrl Alt 1
OSB 02	Ctrl Alt 2
OSB 03	Ctrl Alt 3
OSB 04	Ctrl Alt 4
OSB 05	Ctrl Alt 5
OSB 06	Ctrl Alt 6
OSB 07	Ctrl Alt 7

OSB 08	Ctrl Alt 8
OSB 09	Ctrl Alt 9
OSB 10	Ctrl Alt 0
OSB 11	Keypad Ctrl Alt 1
OSB 12	Keypad Ctrl Alt 2
OSB 13	Keypad Ctrl Alt 3
OSB 14	Keypad Ctrl Alt 4
OSB 15	Keypad Ctrl Alt 5
OSB 16	Keypad Ctrl Alt 6
OSB 17	Keypad Ctrl Alt 7
OSB 18	Keypad Ctrl Alt 8
OSB 19	Keypad Ctrl Alt 9
OSB 20	Keypad Ctrl Alt 0

Lights

External anti-collision	Ctrl Alt F10
External power	Ctrl Alt F9
External steady	Ctrl Alt F12
External wing	Ctrl Alt F11
Interior lights	unassigned
Test lights	Ctrl t

MFD

Step 1	[
Step 2	]
Step 3	Shift [
Step 4	Shift]

Radar

ACM 30 x 20	Ctrl F6
ACM boresight	Ctrl F5
ACM slewable	Ctrl F7
ACM vertical	Ctrl F8
Air-to-Air	F1
Air-to-Ground	F2
Antenna center	F6
Antenna tilt down	F5
Antenna tilt up	F7
Bar scan	Shift F8
Cursor down	down arrow
Cursor left	left arrow
Cursor right	right arrow
Cursor up	up arrow
Designate target	Keypad 0

GM FOV	Shift F9
GM picture freeze	F10
GM snowplow	Shift F10
HSD range decrease	Shift F11
HSD range increase	Shift F12
Maverick FOV	Shift v
RF inhibit	Shift Alt r
Range Knob down	Ctrl F3
Range Knob up	Ctrl F4
SOI FOV	v
Cursors reset	Shift down arrow
Gain decrease	Shift F3
Gain increase	Shift F4
Lock next target	Page Down
Lock previous target	Delete
Range decrease	F3
Range increase	F4
Return to search	Keypad . (period)
Standby	Ctrl r
Submodes/Azimuth	F11

Radio

ATC message	t
AWACS command	q
Channel cycle	Alt y
Element command	e
Flight command	r
Menu	Tab
Tanker command	y
Wingman command	w

Right MFD

Brightness down	Shift Alt f
Brightness up	Shift Alt g
OSB 01	Shift Alt 1
OSB 02	Shift Alt 2
OSB 03	Shift Alt 3
OSB 04	Shift Alt 4
OSB 05	Shift Alt 5
OSB 06	Shift Alt 6
OSB 07	Shift Alt 7
OSB 08	Shift Alt 8
OSB 09	Shift Alt 9
OSB 10	Shift Alt 0
OSB 11	Keypad Shift Alt 1

OSB 12	Keypad Shift Alt 2
OSB 13	Keypad Shift Alt 3
OSB 14	Keypad Shift Alt 4
OSB 15	Keypad Shift Alt 5
OSB 16	Keypad Shift Alt 6
OSB 17	Keypad Shift Alt 7
OSB 18	Keypad Shift Alt 8
OSB 19	Keypad Shift Alt 9
OSB 20	Keypad Shift Alt 0

RWR

Handoff	Shift Page Down
Low	Home
Naval	Shift Page Up
Power	unassigned
Priority	Insert
Search	Shift Insert
Target Separate	Page Up
Unknown	Shift Home

Simulation

Calibrate joystick	Alt c, j
Chat	` (grave)
Exit	Esc
Freeze	Shift p
Mouse button 1	Alt q
Mouse button 2	Alt w
Mouse SOI hold	unassigned
Mouse SOI off	Alt]
Mouse SOI on	Alt [
Mouse SOI toggle	unassigned
Pause	p
Reset trackIR(r)	Alt C, t
Screen capture	Sysreq
Set afterburner detent	Alt c, k
Show score	Alt r
Smoke toggle	Ctrl s
Time acceleration 2x	Caps Lock
Time acceleration decrease	Ctrl Caps Lock
Time acceleration increase	Shift Caps Lock
Cockpit setup load	Alt c, l
Cockpit setup save	Alt c, s
Labels far	Ctrl l
Labels near	Shift l

Sound

Sound down	Alt b
Sound off	Alt s
Sound up	Alt n
Missile volume down	Shift Ctrl [
Missile volume up	Shift Ctrl]
Threat volume down	Shift Alt [
Threat volume up	Shift Alt]

Trim

AP disc	Ctrl 4
Aileron left	Shift left arrow
Aileron right	Shift right arrow
Elevator down	Alt down arrow
Elevator up	Alt up arrow
Manual nose down	Shift Alt End
Manual nose up	Shift Alt Home
Manual roll left	Shift Alt Delete
Manual roll right	Shift Alt Page Down
Manual yaw left	Shift Alt Insert
Manual yaw right	Shift Alt Page Up
Reset	Shift up arrow
Rudder left	Alt left arrow
Rudder right	Alt right arrow

View

2D cockpit	2
Action Camera	Shift ` (grave)
Aircraft next	Shift . (period)
Aircraft previous	Shift , (comma)
Chase	9
Cockpit 10 o'clock	Keypad Shift Ctrl Alt 7
Cockpit 2 o'clock	Keypad Shift Ctrl Alt 9
Cockpit 3 o'clock	Keypad Shift Ctrl Alt 6
Cockpit 4 o'clock	Keypad Shift Ctrl Alt 3
Cockpit 8 o'clock	Keypad Shift Ctrl Alt 1
Cockpit 9 o'clock	Keypad Shift Ctrl Alt 4
Cockpit HUD zoom	Shift 1
Cockpit HUD	Keypad Shift Ctrl Alt /
Cockpit wide/normal	Shift 2
Cockpit lower left	Keypad Shift Ctrl Alt 0
Cockpit lower tight	Keypad Shift Ctrl Alt 2
Enemy aircraft	Ctrl 8
Enemy vehicle Alt 8	Alt 8

	Extended FOV	5
	Flyby	Shift 9
	Friendly	8
	Friendly ground unit	Shift 8
	Glance backward	Keypad 3
	Glance forward	Keypad 9
	HUD only	1
	Incoming	7
	Look closer	l
	Mouse look hold	unassigned
	Mouse look off	unassigned
	Mouse look on	unassigned
	Mouse look toggle	unassigned
	Orbit	o
	Padlock	4
	Padlock Extended FOV mode AA	Shift 5
	Padlock Extended FOV mode AG	Alt 4
	Padlock next	Keypad +
	Padlock next AA	Keypad Shift +
	Padlock next AA	Keypad Shift +
	Padlock next AG	Keypad Alt +
	Padlock previous AA	Keypad Shift -
	Padlock previous AG	Keypad Alt -
	Padlock previous	Keypad -
	Reset	Keypad Shift Ctrl Alt 5
	Rotate down	Keypad 2
	Rotate left	Keypad 4
	Rotate right	Keypad 6
	Rotate up	Keypad 8
	Satellite camera	Alt ` (grave)
	Target	Shift 6
	Toggle SA bar	Shift 3
	Tower camera	Alt 0
	Tracking view	6
	Virtual cockpit	3
	Weapon	Shift 7
	Weapon's target	Alt 7
	Zoom in	Keypad 1
	Zoom out	Keypad 7

Voice

|	
Transmit Comm 1	Alt 1
Transmit Comm 2	Alt 2

Weapons

|	
Air-to-Air cycle hardpoints	Enter
Air-to-Ground cycle hardpoints	Backspace
Bomb interval decrease	Ctrl ;
Bomb interval increase	Ctrl '
Bomb ripple decrease	Shift ;
Bomb ripple increase	Shift '
CBU burst altitude decrease	Ctrl ,
CBU burst altitude increase	Ctrl .
Fire gun	/
Manual reticle	Shift Ctrl m
Missile boresight/slave	Ctrl u
Missile hardpoint cycle	Shift /
Missile TD/BP	Alt u
Pickle	Space
Release bombs in pairs	Alt '
Release bombs singly	Alt ;
Sidewinder spot/scan	Shift u
Sidewinder cage/uncage	u

Notes on Use of Special Keys

Depending on your keyboard, many function keys on your Mac may be assigned to special features of Mac OS, such as Exposé and Spaces. You will need to release the associated function keys before playing Falcon 4.0: Allied Force so that the game can have full access to the function keys. We recommend the following steps to release function keys:

1) Open System Preferences in your Dock and click Keyboard.
2) Check "Use all F1, F2, etc. keys as standard function keys". This will prevent you from having to hold the "Fn" key while using the function keys within Falcon. Note that you WILL need to hold the "Fn" key to access the special features printed on the Function keys (Screen brightness, Exposé and Spaces, Dashboard, Music player controls).
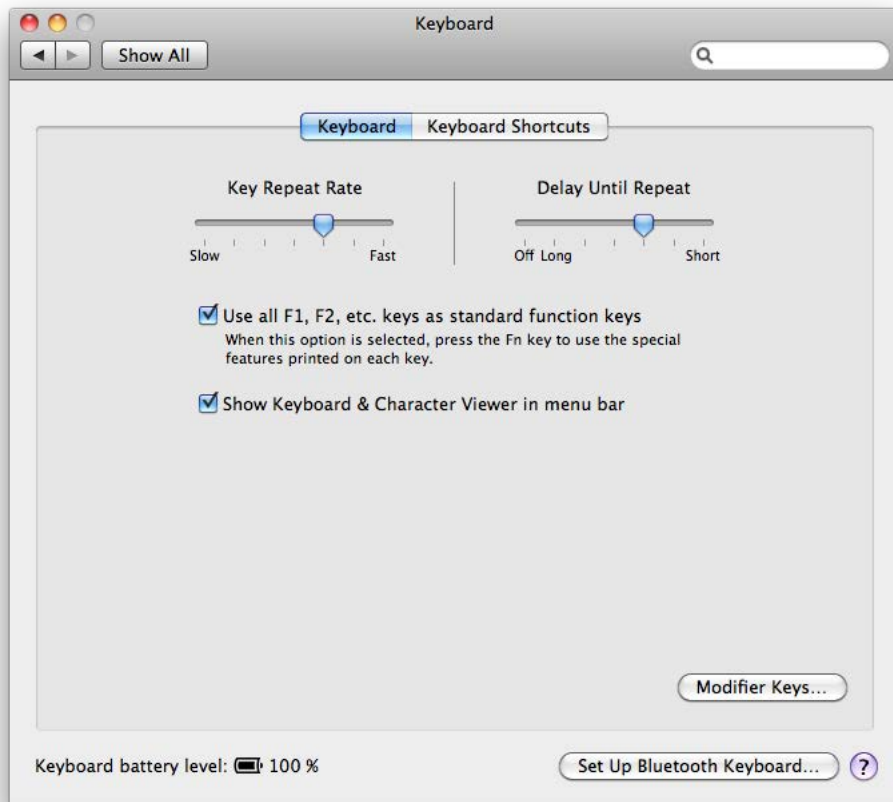

3) Click "Show All".

4) Click Exposé and Spaces, and then select the "Exposé" tab (highlighted in blue).
5) Manipulate the pop-up menus so that NO function key is assigned to any feature. Note that you will still be able to access Exposé and Spaces from the keyboard using the "Fn" key.
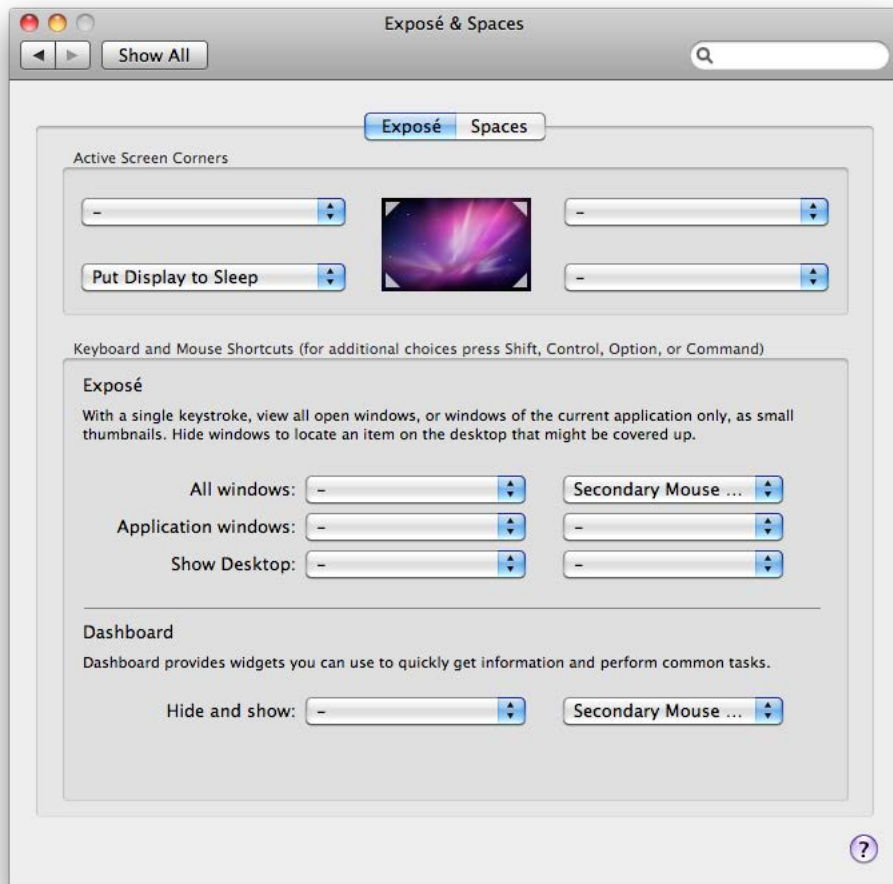
6) Select the "Spaces" tab (highlighted in blue).
7) Manipulate the pop-up menu labeled "To activate Spaces:" so that NO function key is assigned. Also manipulate other pop-up menus to release other keys which may be used by Falcon, like Arrow keys.
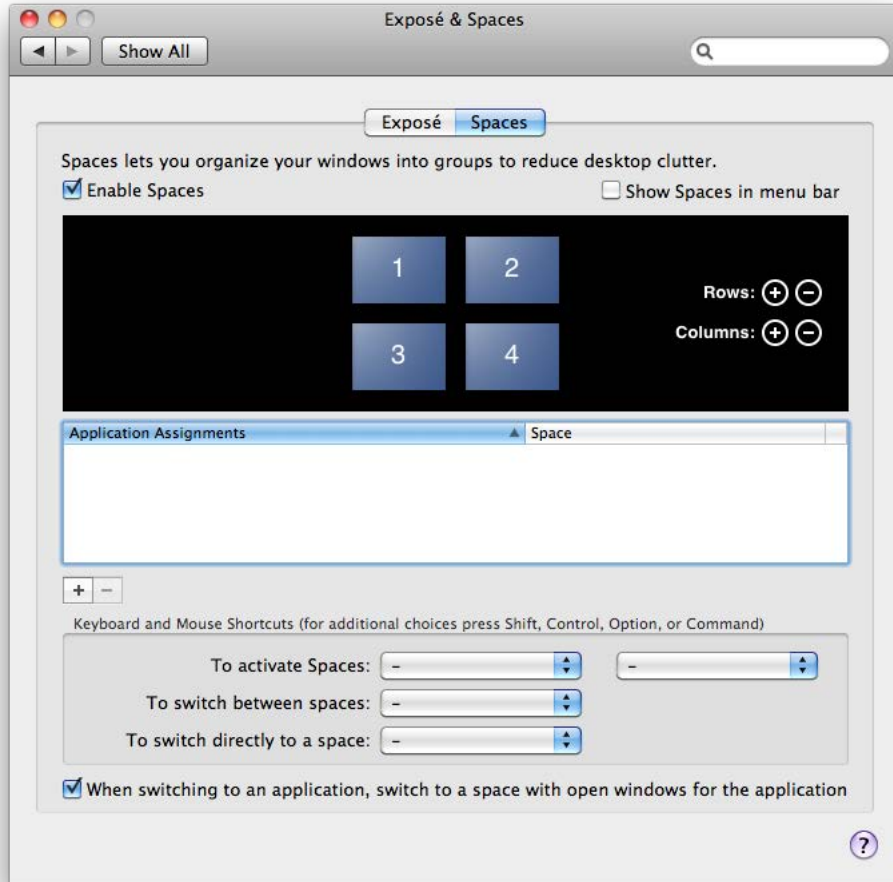
8) Alternatively, you may entirely disable Spaces by UNchecking "Enable Spaces" (shown checked.)
9) Close System Preferences and you are done.

To change keyboard assignments for keys used within the game, refer to the Falcon 4.0: Allied Force Manual.