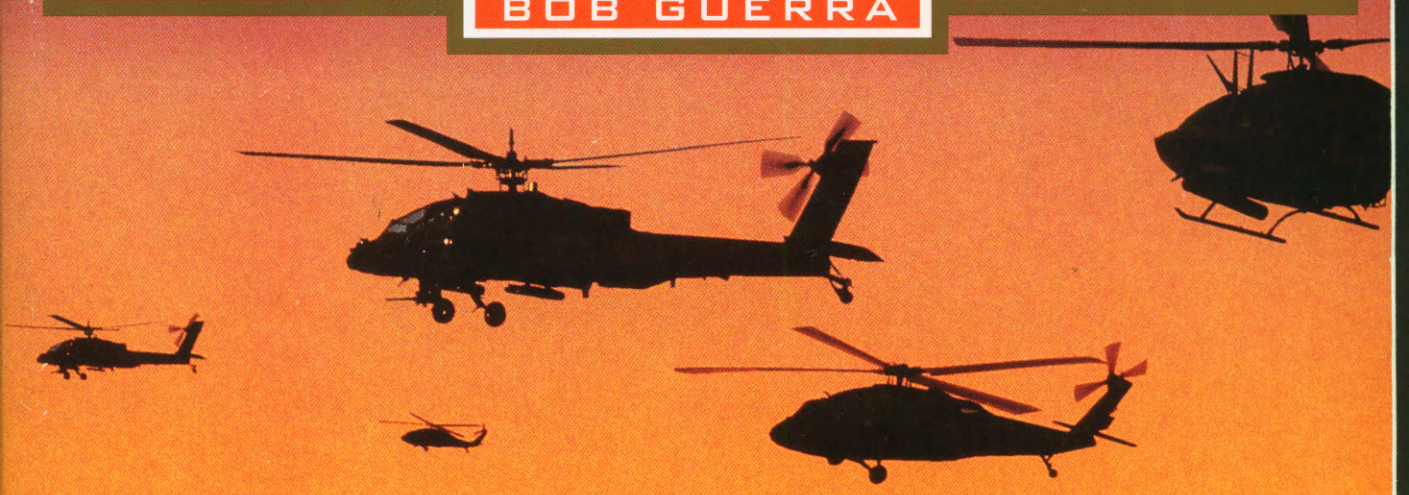
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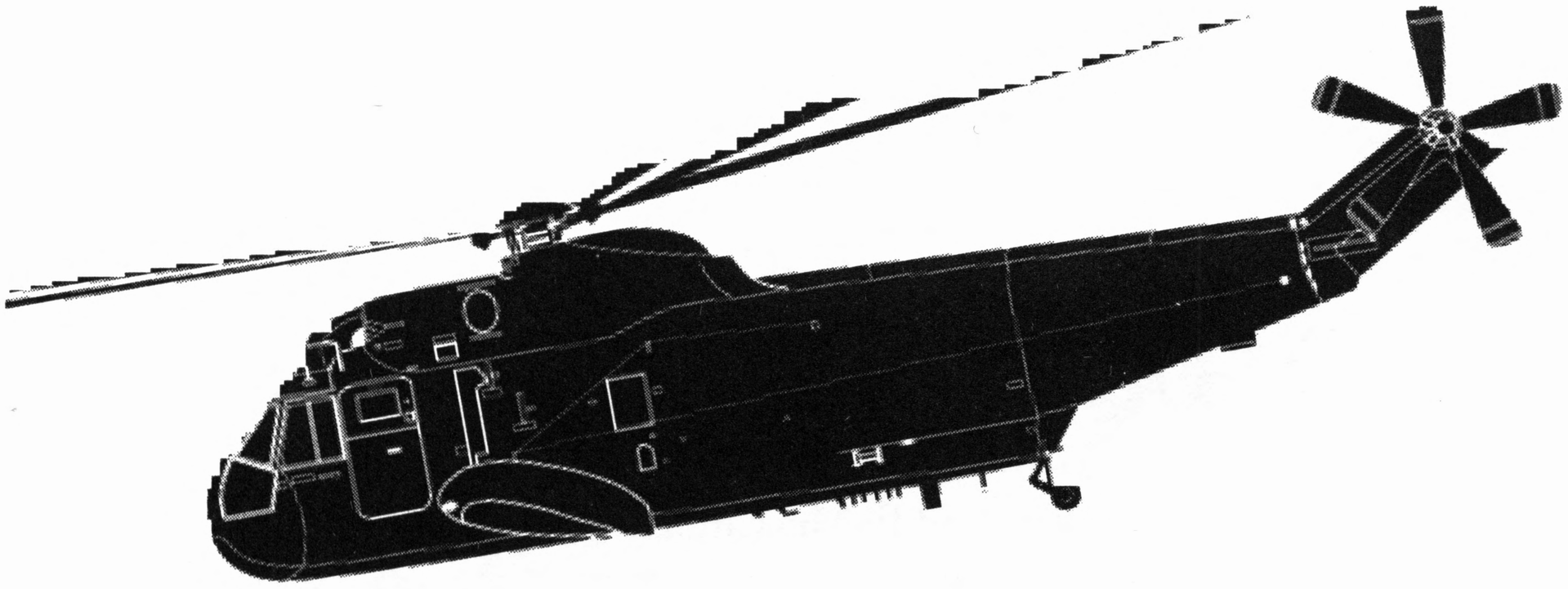
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GUNSHIP 2000

The Authorized Strategy Guide

Bob Guerra

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DEDICATION

For Gloria and Ralph

Table of Contents

Acknowledgments ix
Foreword xi
Introduction xiii

Part 1: Historical Background **3**
The Original Gunship 3
Gunships of Operation Desert Storm 7
The Choppers 16
AH-64A Apache Gunship 17
AH-64C Longbow Apache Gunship 20
AH-1W SuperCobra Gunship 22
AH-6G Defender Light Gunship/Scout Helicopter 24
OH-58D Kiowa Warrior Scout Helicopter 26
UH-60K/L Black Hawk Assault Helicopter 29
RAH-66A Comanche Gunship/Scout Helicopter 33

Part 2: Basic Training **37**
Flight School 39
Arming Your Chopper 47
Navigation 56
Strategy and Combat Tactics 66
Training Flight 81
Learning from Your Mission Films 91

Part 3: The Missions
(Or, My Career as a Gunship Pilot) 99
On Your Own: Single Helicopter Missions 100
Point Attack 101
Search and Destroy 110
Taking Command: Multi-Helicopter Flights 116
Point Attack 119
Search and Destroy 126
Deep Strike 132
Tactical Support/Search and Rescue 139
Recon 145
Campaigns 150

Part 4: Additional Information 153
Scoring 153
Target Point Data 157
Islands and Ice/Mission Builder 163
Just For Fun 167
Interview (Jim Day, Darrell Dennies, and Detmar Peterke) 173

Tables 193
Table 1: Upgrade Table 193
Table 2: Weapons 197
Table 3: Targets 199

Glossary 211
Bibliography 219

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Foreword

Computer simulations have taken many different approaches in presentation; many of them have been very creative and have met with great success. Still, they all seem to share one common denominator—they limit the player's ability to just play at the game. There is a subtle, but very different philosophy between these two approaches.

The design of *Gunship 2000* had at its root one basic premise: allow the player to approach and play the game just the way he or she wants to play the game. At first this may seem to be double-talk, but that is not really the case.

The key element here is flexibility and the limitation of the rigid "you must do it this way" aspect of the game. After all, these simulations are still games, customers buy these products for entertainment, not to become the next greatest real-life jet fighter pilot or helicopter ace. When we start to view these games as key elements to surviving life, we are missing the point. The object is not the entertainment of the MicroProse development team. Let the player determine what he or she thinks is fun.

The embodiment of *Gunship 2000* and the Islands & Ice scenario disk is this flexibility. If the players do not care for a certain approach or result, they can change it. This is illustrated in the flexibility of the reality switches, functionality of the mission builder and the ability to eliminate unwanted missions by re-posting the duty roster.

Some may ask what all this has to do with reality? Well, reality is elusive notion; one person's reality is another person's abstraction. We deal in pure unadulterated

escapism, why attempt to constantly penalize or teach the player a "hard lesson". All that accomplishes is a reduction in the fun factor, and equates into less play time, and ultimately reduced sales. No one wants to have a character eliminated or black marked for a singular lapse in judgment. That is what happens in real world; a bit too harsh for our situation. It is certainly acceptable to show what could result, but an optional way out must be available. Is this cheating the fates? I do not think so.

If you can not say that you had fun playing the game, what was the point in any case? Players know how they achieved promotion to Brigadier General or how they won the Congressional Medal of Honor. Should we, or anyone else for that matter, care if it took 437 trips to the bottom drawer before achieving that last great promotion? So what if they did create a mission with 45 enemy submarines to get the Medal of Honor, it does not really matter in the big blueprint of life. The crux of the matter is that they had fun doing it, and are personally satisfied with the result.

That is why *Gunship 2000* is the way that it is. Sure, there are some options that may not always embrace the real world, but that is just what they are—options. The purists can ignore all of these non-reality alternatives and play it straight—that is their truth. As long as everyone is having fun, we have been successful in our endeavors.

The customer is the true and final judge of any successful product. It does not really matter if we think a game is good. If a game does not sell, it is not a success; that is plain simple economics. *Gunship 2000* seems to be one of those lucky few products that are able to balance the important elements. You can play it for its serious aspects or you can just have some serious fun.

Jim Day
September 1992

Introduction

In writing *Gunship 2000: The Authorized Strategy Guide,* I've tried to accomplish three things: First, to create an entertaining book. After all, no book can help you become an ace gunship pilot if it puts you to sleep. I've even included a section called "Just for Fun" that's full of entertaining activities to try when you're tired of dodging SAMs. Here you'll learn the fine art of piloting your Comanche under a rail bridge, just where to find the MPS billboard, and the best weapon systems for taking out a camel at three klicks.

Second, as an avid fan of combat simulators, I understand that it's not only breathtaking graphic resolution or digitized rockets blasting from stereo speakers that makes a simulation enjoyable (although, as far as I'm concerned, these are two of the best reasons for owning a PC in the first place). A good simulation is also enhanced by information that links the computer screen to the real world.

This isn't to say that a simulator like *Gunship 2000* can't be enjoyed by someone without a complete understanding of the aerodynamics of helicopter flight, or someone lacking a thorough knowledge of the social and political dynamics of the regions where your simulated combat takes place. I do believe, however, that a little background information can bring a simulation to life and thus help to draw the player into its world.

To this end, I've included information on the gunships of Operation Desert Storm, the theaters of operation where you'll be flying, and the actual choppers featured in *Gunship 2000*. If you'd rather just jump right into the cockpit of your

Apache and head for the front, feel free to skip these sections. If, however, you ever find yourself "flying a desk" or need a break from a tough campaign, I urge you to come back to these sections. (I'd hate to think I spent all that time waiting in line at the library photocopier for nothing!)

Finally, and above all else, I've done everything possible to make this book a valuable instructional companion to a superb simulator. After all, the reason you take a strategy guide like this from the bookstore shelf is to learn the author's methods for becoming a better player. Your main objective in reading such a book is most likely to boost your scores, and perhaps to pick up a few "secrets" or shortcuts that aren't necessarily apparent to the casual player or even to the die-hard electronic warrior. Although I can't guarantee that after reading this book your next mission will make you a Congressional Medal of Honor winner, or that you'll never again take an IR-guided missile up the tail rotor, I can guarantee that your scores will improve, your rank will soar, and you'll tackle each new mission with confidence.

—Bob Guerra

GUNSHIP 2000

The Authorized Strategy Guide



PART 1

Historical Background

THE ORIGINAL GUNSHIP

In the spring of 1987, after more than a year of anticipation, I received my review copy of *Gunship* for the Commodore 64. I've enjoyed previous MicroProse titles such as *MiG Alley Ace*, *Solo Flight*, and *Silent Service*, and was amazed by the sophistication (and playability) of *F-15 Strike Eagle*, a game that less than two years after its release was already considered a classic.

At that time, I was regularly reviewing software for the Commodore-specific magazine *RUN*. The *Gunship* assignment was one I made sure I locked up well in advance of the program's release. MicroProse helped in this regard by heavily promoting the game several months before it was ready to ship. In fairness to MicroProse, however, this wasn't a typical case of a software company overhyping a new program. In those days MicroProse would routinely put all its eggs into one basket, devoting all possible resources, from "Wild Bill" Stealey (President of MicroProse) on down, to the production of a single title such as *Gunship*.

Ultimately the *Gunship* project required four times the anticipated manpower, and took three times longer to complete than anyone had expected at the outset.

Fortunately, the finished product was well worth the wait. *Gunship* was an addictive game, though not in the same way as most mindless arcade shoot-'em-ups. It challenged players with a variety of realistic missions that required both careful planning *and* a skillful hand on the joystick.

One of the things that distinguished *Gunship* from many combat flight simulators at the time was its random mission generation system. Even when the Duty, Style, and Reality settings were identical, you never knew what type of mission to expect or where the enemy forces would be located. One time, you might be instructed to search and destroy all enemy targets in a specific area; another time, you might be called upon to provide air support for friendly troops.

Because *Gunship* could draw me into its simulated life-and-death drama like few other programs, it was a game I simultaneously hated and loved, cursed and praised. It was one of those games I simply couldn't stop playing, even after I reluctantly switched off the computer at 3:00 AM and dropped my battle-weary head on the pillow.

In the *RUN* review, I said *Gunship* was possibly the "best simulation of any type ever created for the Commodore 64." Shortly thereafter, I wrote *The Electronic Battlefield* (COMPUTE! Books, 1987), a strategy guide that examined several of the most popular wargames and simulators of the time. When I began the project, I immediately knew I'd devote one of the chapters to *Gunship*.

By today's standards, the original *Gunship* was fairly simple, both graphically and in terms of game play. The version of the game I reviewed was an 8-bit, low-res, 16-color production that used the C-64's 4-voice SID chip for sound. What's more, it was crammed into less than 64K of RAM. Nevertheless, the designers of the original *Gunship*,

Arnold Hendrick and Andy Hollis, along with software developers Gregg Tavares and Sid Meier, and artists Michael Haire and Michele Mahan, did a very impressive job of putting the *Gunship* player into the cockpit of an AH-64 Apache.

Though it had been developed on the C-64, *Gunship* was soon ported over to several other popular computers, including the Commodore Amiga, the Atari 800 XL/XE, the Atari 520 ST and 1040 ST, the Apple II, and the IBM PC, PCjr, XT, and AT. One of the programmers who worked on the PC conversion was none other than Darrell Dennies, the programmer who would eventually develop the 3-D topographical environment used in *Gunship 2000*. Darrell recently told me that the *Gunship* conversion was one of his first projects to work on at MicroProse after his arrival from England, and one of the reasons he was chosen to be on the *Gunship 2000* team.

Gunship went on to become one of MicroProse's most successful titles. However, unlike *Gunship 2000*, which allows you to command multi-helicopter flights in any of seven different choppers, the original *Gunship* limited pilots to single-helicopter missions in one helicopter—the AH-64A Apache. In fact, one of the new helicopters featured in *Gunship 2000*, Boeing Sikorsky's RAH-66 Comanche, hadn't even made it onto the drawing board when *Gunship* was released.

Only four weapon types were available to the *Gunship* pilot: AIM-9L Sidewinder missiles to dispose of long-range air threats, 2.75" FFAR rockets for all non-armored or lightly armored threats, AGM-114A Hellfire missiles to obliterate heavily armored enemies such as tanks and bunkers, and a devastating 30mm chain gun, which could be used to eliminate virtually any threat that was unfortunate enough to find itself within range (1.5 km). Missing from the *Gunship* pilot's arsenal, however, were several weapons, including Helstreaks, Mavericks, Stingers, Sidearm anti-radiation missiles, Penguin anti-ship missiles, TOW-2s, and the

improved millimeter-wave Hellfires that are available to Longbow Apache pilots on the *Gunship 2000* tour of duty.

Another difference between the original *Gunship* and its successor was the number of regional deployments available to the pilot. After training in the United States against "dummy" SA-9s, ZSU-23s, T-74s, and BMPs, the *Gunship* pilot could choose deployment in Southeast Asia, Central America, the Middle East, or Western Europe. Each region was represented by a single map that encompassed roughly 80 square miles, and the difficulty of each region varied with the level of training of the troops and the sophistication of the weapon systems found there. Thus Southeast Asia, with its outdated SA-7s and limited radar capability, was the easiest region, whereas Western Europe, with its crack Warsaw Pact troops and its modern equipment, including ZSU-30s, SAMs, and BMPs, posed the toughest challenge.

Like *Gunship 2000*, the original *Gunship* offered both Easy and Realistic flight modes. The Easy mode was actually an afterthought, added because many of the game's playtesters found it extremely difficult to maintain stable flight in the standard (Realistic) mode. When Jim Day, Darrell Dennies, and Detmar Peterke began work on *Gunship 2000*, they decided to include both flight modes from the original *Gunship*, but knew right away that they would make *Gunship 2000's* Realistic mode much easier to control than that of its predecessor.

It's been nearly seven years since *Gunship* first kept me awake nights hunting T-72s and dodging enemy SAMs. Although several combat helicopter simulators have found their way onto and off my hard drive since that time, few have struck such a perfect balance between realism and playability as *Gunship*.

Many of the 8-bit computers that MicroProse supported—the Commodore 64, the Atari 800, and the Apple II, for example—have all but disappeared as platforms for software development. Even my two-year-old 286/12, with a meg of RAM, a VGA display, and a Sound

Blaster board, has lately been straining to run the newest simulators from MicroProse and other companies. Today, 386-based PCs running at 25 to 33 MHz with 2 to 4 megs of RAM are considered entry-level machines, representing the minimum requirements of today's state-of-the-art combat flight simulators.

Meanwhile, back in the non-simulated world, during the time since *Gunship* was released, we've witnessed the disintegration of the Soviet Union, the formation of the fragile Commonwealth of Independent States, and bilateral cutbacks in defense spending. Thus many of the standard wargame scenarios of the past, which pitted U.S. forces against first-line Soviet troops in Western Europe, have become somewhat obsolete.

However, just as it was becoming clear that the Soviet Union would never again pose a unified military threat to the United States, the long-feared involvement of U.S. forces in the volatile Middle East was becoming a reality. The Persian Gulf War was to be the first major conflict in which modern U.S. weapon systems such as the AH-64 Apache were put to the test.

GUNSHIPS OF OPERATION DESERT STORM

In the early morning hours of January 17, 1991, eight heavily armed AH-64 Apache helicopters lifted off from a base in Saudi Arabia and headed toward the Iraqi border. As they navigated their flying tanks through the warm black air, each gunship pilot knew that the success of his mission would be critical to the overall success of the early phases of the air war against Iraq. Within minutes, this swarm of "killer bees" from the U.S. Army's 101st Airborne Division crossed undetected into Iraqi airspace. Before long their targets, two Iraqi radar stations, were within range.

Before the Iraqis had time to respond, the low-flying Apaches began to launch laser-guided Hellfire missiles at



Figure 1.1 "Killer Bees" in formation

the radar stations and surrounding structures. Fifteen Hellfires were launched by the Apaches; all 15 found their targets. Even as the first Hellfires were exploding on impact and illuminating the desert sands with bright flashes of white, clusters of Hydra 70 rockets began raining down on the Iraqis' "early warning" system. Finally, the attack ended with the spray from the Apaches' 30mm chain guns pouring down on the burning installations like gasoline on a raging bonfire.

Although the radar sites destroyed in this initial attack were just two in a line of several Iraqi radar stations guarding the country's western border, their destruction by U.S. attack helicopters provided coalition air forces with a blind spot in Iraq's air defense system through which all types of attack aircraft could safely pass.

In addition to their role in the early phases of the air war, AH-64 Apache helicopters also served, along with A-10 Thunderbolt "Warthogs," as effective tank killers throughout Operation Desert Storm. Often other helicopters, or even foot soldiers, would project laser spots onto Iraqi tanks while Apaches launched Hellfire missiles from a safe distance (up to almost 5 miles). The Hellfires would then lock onto the laser beams and essentially ride them right to their targets. Hellfires were also used during Apache-assisted raids on bunker complexes in Southern Iraq, which resulted in the surrender of almost 600 Iraqi soldiers.

Although the Apache was never built to operate in the high temperatures and sand-filled air of the desert, the helicopter proved itself to be a potent high-tech asset during the Gulf War. This success came despite years of criticism aimed at the Apache's apparent reliability problems. Among the failures that had plagued the Apache prior to its supporting role in Operation Desert Storm were jammed guns, broken drive shafts, and easily cracked rotor blades.

Even in November 1990, during the buildup, or "Desert Shield," phase of the operation, the reliability of the Apache's weapon systems came into question when a Hellfire missile was accidently launched into an ammo dump from an Apache as the helicopter sat on an airfield in Saudi Arabia.

Other accidents included a fire involving the auxiliary power unit of an Apache as it was being offloaded from a ship on January 7, 1991, and the January 20, 1991 crash of an Apache while attempting to land. Despite these problems, the overall mission-readiness of the Apache was reported to be about 80 percent during Operations Desert Shield and

Desert Storm. (The army's peacetime goal for the $11.7 million helicopter is only 75 percent).

This improved performance resulted partly from some special treatment given to the Apaches. To protect the rotor from the blowing desert sands, for example, ground crews in Saudi Arabia covered the leading edges of the Apache's four main rotor blades with paint or tape. Further, special coverings and filters were used to keep the powdery fine sand from clogging the helicopters' engines and gears.

While the AH-64 Apache received most of the press attention during the Gulf War, it was by no means the only helicopter gunship to make a significant contribution to Operation Desert Storm. Another of the *Gunship 2000*

Figure 1.2 AH-1W SuperCobra dressed for desert warfare



choppers that performed admirably during the Gulf War was the AH-1W SuperCobra, or the "Whiskey," as the Marines call it. As many as 50 of the Marines' 100 Whiskeys were deployed in the region. According to Bell Helicopter, maker of the SuperCobra, during Operations Desert Shield and Desert Storm the AH-1W averaged over 30 hours per month in the air and achieved 92 percent of full-mission capability during the ground war.

It was also reported that during one attack, the AH-1W SuperCobra made seven out of eight direct hits with missiles. This performance is said to have led to the surrender of an entire Iraqi battalion. According to Colonel Randy West, Commander of the Marine Aircraft Group-39, many of the Iraqi troops were even afraid to leave their bunkers to surrender until after the SuperCobras had left the area.

A close relative of the SuperCobra, the Marines' SeaCobra helicopter, also saw its share of action during the Gulf War. On the morning of February 25, 1991, the second day of the ground war, fighting at the Al Jabr airfield near Kuwait City was threatening to halt the progress of the 1st Marine Division. SeaCobras armed with TOW missiles attacked the Iraqi position, with artillery support and coordinated airstrikes by the Air Force and the Marines. As a result, more than two dozen Iraqi tanks and APCs were destroyed.

While Apaches and Whiskeys were busy pounding Iraqi tanks and bunkers, armed OH-58D Kiowa Warriors, with their sophisticated mast-mounted sights, were proving to be the most advanced armed reconnaissance helicopters in the world. These scouts of the Army's 4th Squadron, 17th Aviation Regiment, had actually been patrolling in the Persian Gulf for almost 2½ years, as part of Operation Prime Chance, before Saddam Hussein's decision to invade Kuwait in August 1990.

Designated Task Force 118, this, the Army's first Corps-level armed reconnaissance squadron, was sent to the



Figure 1.3 OH-58D Kiowa launching a Hydra 70 rocket

Persian Gulf during the spring of 1988 to protect U.S. ships and to help guard the sealanes against Iranian gunboats and minelayers. The fifteen OH-58Ds that made the trip were actually souped-up versions of the unarmed Kiowa. Added to the basic OH-58D were Hellfire and Stinger missiles, Hydra 70 rockets, an Aerocrafter .50-caliber machine gun, radar warning receivers, IR jammers, and an upgraded transmission to handle all that added weight.

On January 16 and 17, 1991, Army OH-58Ds flying from the U.S. frigate *Nicholas*, with the support of naval gunfire and a Kuwaiti patrol boat, helped to seize control of nine

armed oil platforms in the Persian Gulf, and in the process claimed the first Iraqi prisoners of war. Less than a week later, two Kiowas had been launched from the *U.S.S. Curts* to search for minelayers when they were called upon to assist Navy SEALs attacking an Iraqi-controlled island. The combined forces were able to gain control of the island—this was actually the first part of Kuwait to be liberated—and in the process collected 29 more Iraqi prisoners of war.

Armed OH-58D Kiowa Warriors also led the way when U.S. Special Forces finally entered Kuwait City to liberate the U.S. and British embassies. While the dense smoke from burning oil wells made flying into Kuwait extremely dangerous, the forward-looking infrared (FLIR) component of the Kiowa's mast-mounted sight allowed the pilots to see through the smoke so they could avoid flying directly into Kuwaiti power lines. The only Kiowa Warrior lost during the Gulf War crashed in the desert while flying through thick fog. Fortunately, its crew was eventually rescued.

On the second day of the ground war, February 25, 1991, swarms of UH-60 Black Hawks were busy doing one of the things that they do best—transporting troops to the battle zone. More than 1,000 troops from the 101st Airborne hitched rides to the Euphrates Valley aboard Black Hawks. Once in place, the troops attacked Iraqi supply convoys along Highway 8, which connects Baghdad and Basra. Black Hawks were also on hand to transport the first Marines to the U.S. Embassy in Kuwait City to clear the building and prepare for its grand reopening.

To protect U.S. ships from Iraqi-laid mines in the Persian Gulf, coalition forces used mine-countermeasure ships as well as MH-53E Sea Dragon helicopters. The Sea Dragons, which were flown from the U.S. helicopter carrier *Tripoli*, dragged a variety of devices through the water to set off the Iraqi mines. Some Sea Dragons towed hydrofoil sleds equipped to detonate both magnetic and acoustic mines, while others towed a device called a MOP (Magnetic Orange Pipe) to set off shallow-water mines.



Figure 1.4 UH-60 Black Hawk skimming the tree tops

Unfortunately, the coalition's mine countermeasures let some of the mines slip through, and several coalition ships did strike mines. Ironically, while operating in the waters off the Kuwaiti coast, the *Tripoli* was one of two ships to hit mines on February 18, 1991. Luckily, the ship suffered only minor damage and was never in danger of sinking.

On the other side, the Iraqis were believed to have about 40 Soviet Mi-24s and as many as 60 Gazelles operating during the Gulf War. The French-built Gazelles, equipped with anti-tank missiles, had been used effectively by Iraq during the Iran-Iraq war. Against coalition forces, however, they seemed to have little impact. One Iraqi helicopter was

reportedly shot down by an F-14A Tomcat with a Sidewinder missile, while in an unusual air-to-air kill, a U.S. fighter destroyed an Iraqi helicopter by first spotting it with its laser designator and then hitting it with a smart bomb as the helicopter lifted off the ground. Because of the unusual circumstances surrounding this encounter, it was never officially listed as an "aerial kill."

What many people probably don't realize about the Gulf War is that one of the most important helicopter missions flown by U.S. forces actually took place on January 9, 1991, nine days before the air war even started. What made this mission so unusual is that instead of AH-64A Apaches, AH-1W SuperCobras, OH-58D Kiowas, or UH-60 Black Hawks, the American Special Forces charged with carrying out the top-secret mission were actually flying Soviet-built helicopters that had been painstakingly painted, down to the last detail, with Iraqi markings.

Their mission was to fly into Iraqi territory to tap the Iraqi communications system and to mark targets for laser-guided weapons. The operation was kept so quiet, in fact, that even our Saudi allies were unaware that it was taking place. Thus, when our six "Iraqi" choppers were spotted by F-15s patrolling for the Saudi Air Force and radio contact was made, the safest course of action for the Special Forces was to tell the Saudis that they were defecting Iraqi pilots. The Saudis bought it.

Unfortunately, before the matter could be cleared up, the Saudis announced the apparent defection to the world; American military spokesmen in Riyadh, as well as the Pentagon, confirmed the story. However, the next day, not only did everyone involved deny that any defections had taken place, but the Saudi defense minister, Sultan bin Abdul Aziz, went as far as to deny that the defections had even been reported. After a few days of similarly contradictory statements by the Pentagon, the whole matter died down and it wasn't until the end of the war that security was loosened and the story behind these "defections" was revealed.

THE CHOPPERS

The AH-64A Apache gunship, perhaps more than any other combat chopper, has come to represent the modern, high-tech military helicopter. Even when people are thinking "Huey" or "Cobra," they're often picturing "Apache." For example, while writing this book, I often visited local bookstores in search of anything related to military helicopters. One day I noticed a book called *Maverick* (Jove Books, 1991). It immediately grabbed my attention because its front cover prominently featured the unmistakably bug-like front of an Apache gunship, complete with a blazing Hellfire bursting from the starboard weapons wing—as in the opening animated sequence of *Gunship 2000*.

Figure 1.5 AH-64A Apache



Now, *Maverick* is an excellent book, which presents the personal story of Dennis J. Marvicsin, a veteran gunship pilot and former POW. It is interesting to note, however, that Marvicsin's career as a chopper jock ended years before the Apache was even on the drawing board. He served two tours in Vietnam flying combat missions in Hueys and Cobras.

Even though the Apache is the chopper that flies into the imaginations of most people when they hear the term "gunship," it's only one of several combat helicopters to make its presence felt on the modern battlefield. More important, it's only one of the seven choppers available to *Gunship 2000* pilots. While new recruits can head off to battle in an Apache, SuperCobra, Black Hawk, Defender, or Kiowa Warrior, you must achieve the rank of 1st Lieutenant before you get your hands on a Comanche, and you must be a Captain before you can fly the Longbow Apache.

This section will provide you with background information on the roles and capabilities of all these gunships. Technical specifications of each of these helicopters are shown in Table 1 on page 18.

AH-64A Apache Gunship
(McDonnell Douglas Helicopter Company)

With its sophisticated avionics, advanced communications systems, navigational flight aids, and survivability systems, along with the ability to carry 16 Hellfire missiles, 2 rocket pods, and a 30mm chain gun into combat, the Apache is like a bully with brains—like a heavyweight prizefighter with a Ph.D., who can fight just as well in a dark alley as he can in the glare of the boxing ring.

Using the forward-looking infrared system, auto-focusing thermal imager, and video camera, an Apache pilot or copilot/gunner (CP/G) can scan for enemy tanks and armor during the day or at night. An airborne target hand-off subsystem (ATHS) keeps multiple helicopters in a flight from selecting the same targets, and also allows scout

TABLE 1: THE CHOPPER

	AH-64A	AH-64C	AH-1W	RAH-66A	OH-58D	UH-60K/L	AH-6G
Weight (tons)	9.5	9.7	7.6	7.5	2.0	10.0	1.4
Crew/ Pass	2/0	2/0	2/0	2/0	2/0	3/11	2/3
Length (m)	17.8	17.8	17.7	13.2	12.9	17.7	9.8
Width (m)	5.3	5.3	3.3	2.3	2.0	5.5	3.2
Height (m)	4.7	5.6	4.3	3.4	3.9	5.1	3.0
Rotor Diameter	14.6	14.6	14.6	11.9	10.7	16.4	8.3
Engine (shp)	(2)1,696	(2)1,696	(2)1,690	(2)1,000	(1)650	(2)1,560	(1)650
Max Speed (kts)	160	160	170	170	120	160	120
ROC (ft/sec)	42	40	45	40	20	32	28
Ceiling (ft)	21,000	21,000	14,000	15,000	12,000	19,000	16,000
Main Gun	30mm 1200 rds	30mm 1200 rds	20mm 750 rds	20mm 500 rds	None	None	7.62mm MG
Missiles	HF"A" Rkts	HF"B" Rkts	HF"A" TOW Rkts	HF"A" Rkts Stng	HF"A" Rkts Stng	HF"A" Rkts Pods	TOW Rkts
Weapon Load (tons)	3.5	3.5	1.4	2.5	0.4	4.6	0.7

Abbreviations:

HF"A" (standard Hellfire), HF"B" (MMW Hellfire), TOW (TOW-2), Rkts (rockets), ROC (rate of climb), shp (shaft horse power), kts (knots), Stng (stinger)



Figure 1.6 McDonnell-Douglas' AH64A Apache Gunship

helicopters such as the OH-58D Kiowa to designate targets for the Apache.

Once a target, such as a tank or armored personnel carrier, is positively identified, its range is determined and it is "painted," or designated, with a laser beam. Hellfire missiles can then be launched at the target. The Apache's lock-on-after-launch capability allows several Hellfires to be "ripple-fired" at multiple targets. Thus as each missile hits its target, the next missile in the series is assigned a new target with the laser designator. This technique is useful for two reasons: First, it limits the time the Apache is exposed to

enemy fire. Second, since it allows the Hellfire missile to complete much of its flight without a designated target, it gives targets that have the ability to detect and interfere with laser designation systems less time to react.

In order to control this sophisticated target acquisition and designation system (TADS), both the Apache's pilot and its CP/G are required to wear helmets that feature position sensors (to track the helmet in three dimensions within the cockpit) and a display monocle. Because the helmet is fully integrated with the TADS, its wearer need only turn and look at a target to aim and lock his weapons.

Although the Apache is rightfully considered the Army's premier tank-killing attack helicopter, it is also capable of a variety of other missions. These include close support for ground troops, armed escort, and point attack of enemy artillery and various types of installations. The Apache's air-to-air capabilities have yet to be fully demonstrated in combat, but because the Apache can be equipped with AIM-9L Sidewinder missiles and may soon carry up to four Stingers into battle, enemy helicopters and even fixed-wing aircraft could be potential future targets for the Apache.

AH-64C Longbow Apache Gunship
(McDonnell Douglas Helicopter Company)

The Longbow enhancement to the AH-64A Apache is being developed by Martin Marietta and Westinghouse Electric Corp. for McDonnell Douglas. It is a fire-control radar system that uses a *radome,* mounted on a mast above the main rotor blades. The radome houses a radio-frequency interferometer that detects, characterizes, and provides a bearing on active enemy radar systems. In addition, the radome contains the millimeter-wave fire-control radar and target-type discriminating subsystems that are needed by the new millimeter-wave Hellfire missiles (designated AGM-114B) that are being developed as part of the same project.

Unlike the standard AGM-114A Hellfire, which has to be guided all the way to its target with a laser designator, the MMW Hellfire is a true "fire-and-forget" weapon. Targets are automatically handed off from the helicopter's fire-control radar to the missile's internal radar system. The missile's seeker head then guides the missile all the way to the target, freeing the Apache to turn toward new targets or to fly evasively to avoid enemy fire.

Besides the MMW Hellfire's improved guidance system, the missile also features a range 33 percent greater than that of the standard Hellfire (8 km, compared with 6 km for the AGM-114A). In addition, the guidance system of the MMW Hellfire suffers less degradation from rain, fog, and smoke than forward-looking infrared or thermal imagers.

Development of the Longbow system has been delayed because of the excessive weight of the doughnut-shaped radome. The radome has already been redesigned to reduce its weight to under 300 pounds and to give it a more aerodynamic shape. Testing of the radome's effect on the Apache's flight characteristics could last into 1993, when the first fully functional Longbow Apache is expected to be produced.

According to a report by David Bond in *Aviation Week & Space Technology* (April 29, 1991), the U.S. Army plans to reconfigure more than 200 of its eventual inventory of 807 Apaches into Longbows. Together with Boeing Sikorsky's RAH-66 Comanche, the Longbow Apache is likely to be an effective combat helicopter well into the 21st century.

Unfortunately, Longbow Apaches are off limits to all new Warrant Officer candidates. In fact, you'll have to work your way up to the rank of Captain before you're allowed to take a Longbow for a spin. It's important to remember, however, that when you do get the chance to pilot a Longbow, there's a scoring penalty associated with its use, and pilots are directly rewarded with a scoring bonus for completing missions in smaller, lighter choppers.

On the other hand, if you *are* flying a single-helicopter

mission, you're bound to come up with a better score kicking butt in a Longbow than you will by getting shot out of the sky in a Defender. The choice is yours.

AH-1W SuperCobra Gunship
(Bell Helicopter Textron)

Although the Cobra helicopter has been around since the Vietnam war, it continues to see action as a first-rate attack chopper because it has continually evolved to meet the challenges of the modern battlefield. The "W" model, or

Figure 1.7 "Whiskeys" on patrol



"Whiskey," is the latest SuperCobra model to be developed (it became known as the SuperCobra at about the time of the "S" model). The U.S. Army is soon expected to upgrade to "W" standards; the U.S. Marine Corps has already taken delivery of more than 100 SuperCobras.

Marines have used the SuperCobra primarily to provide fire support for the Marine Air Ground Task Force (MAGTF). Specific missions include tank-killing, escorting troop helicopters into battle, suppression of landing zones, search and target acquisition by fire, and multiple-weapon fire support.

Equipped with a General Electric Universal Turret system, the SuperCobra has as its primary armament the M-197 20mm Gatling gun. Like the Apache's 30mm chain gun, the three-barreled M-197 can be aimed by the pilot or copilot through helmet sights. It fires up to 625 shots per minute using standard M-57 rounds, improved PIE 20mm ammunition, or the Navy's Phalanx round, which features a depleted-uranium/tungsten-steel penetrator encased in a discarding sabot sheath.

Besides the M-197 and 750 rounds of ammunition, the SuperCobra can carry up to 680 pounds of missiles, rockets, or additional gun pods on each of four lower wing stores. Thus the weapon wings can be used to carry up to eight TOW-2 or Hellfire missiles, seventy-six 2.75-inch FFARs, sixteen 5-inch ZUNI rockets, or two GPU-2A self-contained 20mm gun pods. To counter airborne threats, the AH-1W SuperCobra can also be equipped with both long-range AIM-9L Sidewinders and lightweight Stinger missiles. A new weapons wing is currently being developed for the SuperCobra that will provide two additional armament stations, allowing the chopper to pack an even greater punch.

Improvements are also planned for the SuperCobra's avionics system, which now includes a full suite of communication systems, navigational flight aids, and survivability systems. In addition, ongoing improvement

programs by Bell Helicopter will provide the SuperCobra with a nose-mounted night targeting system (NTS), which includes a FLIR, laser ranger/designator, and TOW fire controls. This system is integrated with the helmet-mounted sighting system. An airborne target hand-off subsystem (ATHS) data link is also included.

Another planned modification of the SuperCobra involves switching from the current two-bladed rotor system to an advanced, bearingless four-blade rotor system. The new all-composite rotor system is expected to improve the chopper's flight characteristics and to increase its maximum speed by 24 percent. Also, because the new rotor configuration will have far fewer parts, it should be more reliable and easier to maintain than the current two-bladed configuration.

If these modifications to the AH-1W SuperCobra's weapons wing, avionics system, and rotor configuration are all successful, they could guarantee that this "grandfather" of combat helicopters will continue to serve the U.S. military for quite some time.

AH-6G Defender Light Gunship/Scout Helicopter
(McDonnell Douglas Helicopter Company)

As a *Gunship 2000* pilot, sooner or later you'll be required to command a flight on a reconnaissance mission. When you do, remember to have at least one scout helicopter such as the AH-6G Defender in your flight. The Defender is one of only three scout helicopters that can be used to successfully complete a Recon mission. (The other two are the OH-58D Kiowa Warrior and the RAH-66 Comanche.)

Even though the Defender, because of its light weight and its limited ability to carry heavy weapons into battle, is better suited to the role of scout than to that of attack helicopter, it's not totally without offensive capability. The Defender's main weapon is the M-134 7.62mm, 6-barreled minigun. This weapon is extremely effective against

unarmored threats, but its limited range (1.0 km) can be a handicap. In the urban setting of Central Europe, where most of the fighting takes place at relatively close range, the M-134 can be used quite effectively.

In addition, the Defender's two weapons pylons can each be used to carry additional gun pods—either the SUU-11B/A or the GPU-2/A—nineteen Hydra 70 rockets, two Stinger air-to-air missiles, or two TOW-2 missiles. Thus even enemy tanks and helicopters are potential targets for the Defender.

It's also important to remember that you'll receive a significant scoring bonus for completing a mission while flying a light helicopter such as the AH-6G Defender. Although I can't recommend taking a lone Defender out on a point attack or search & destroy mission against Crack or Elite troops, you should definitely take one along as part of a well-armed flight when Recon is one of your two objectives. Simply send the Apaches in first to secure the sector that has to be scouted, then fly your Defender in after them.

The AH-6G Defender light gunship/scout helicopter originally saw action during the Vietnam War as the OH-6A Cayuse. The Cayuse was commonly referred to as a "Loach" because of its designation as an LOH, or Light Observation Helicopter. The current AH-6G Defender is based on the design of the McDonnell Douglas civilian MD530 helicopter.

The Defender features a compact integrated crew station that uses several multi-function displays to enhance the pilot's field of view. Avionics in the Defender includes a full suite of communications systems, navigational flight aids, and survivability systems. Like the Kiowa and Longbow Apache, the Defender has a mast-mounted sight that can be used to identify targets while the helicopter is safely hidden behind a hill or structure. On the Defender, the mast-mounted sight includes a FLIR thermal imaging sensor, a laser range-finder, and fire controls for the TOW-2 missile system.

OH-58D Kiowa Warrior Scout Helicopter
(Bell Helicopter Textron)

Most *Gunship 2000* pilots have their favorite helicopter. For many it's the Longbow Apache. Others feel that the AH-1W SuperCobra is the ultimate gunship. It may interest you to know that Jim Day, the designer of *Gunship 2000*, just loves to fly Kiowa Warriors, although he admits that on his best mission to date, he was in command of a flight of Comanches.

The first OH-58s saw service during the Vietnam War. The Kiowa had been selected as the replacement for the OH-6 Cayuse. It has also seen great commercial success as the JetRanger. Although the Kiowa Warrior is scheduled to be replaced eventually by the RAH-66A Comanche, the government's final go-ahead decision on the Comanche is planned for October 1997, and it's unlikely that the RAH-66 will be in production until the year 2001.

Today, the U.S. Army's inventory contains 195 Kiowas; another 84 Warriors are scheduled for delivery by mid-1993. Eventually, the Army plans to field a total of 477 OH-58Ds by upgrading additional OH-58A models to OH-58D standards.

Visually, the first thing you're likely to notice about the Kiowa is its large mast-mounted sight. The OH-58D Kiowa Warrior's mast-mounted sight has a form that's well suited to its function. It looks like a huge robot head with two large eyes and, in a sense, that's exactly what it is. The sight houses a television camera, an auto-focusing thermal imaging system, and a laser range-finder/designator. This sensor system provides Kiowa pilots with long-range vision during both day and night missions, and allows the Kiowa to serve as the laser designator for its own Hellfires or, by using its airborne target hand-off subsystem (ATHS), for Hellfires launched by a second helicopter, typically the Apache. Thus Kiowas and Apaches can combine to form a devastating hunter/killer team.

Besides four Hellfire missiles, the Kiowa is also capable



Figure 1.8 Kiowa launching from cover

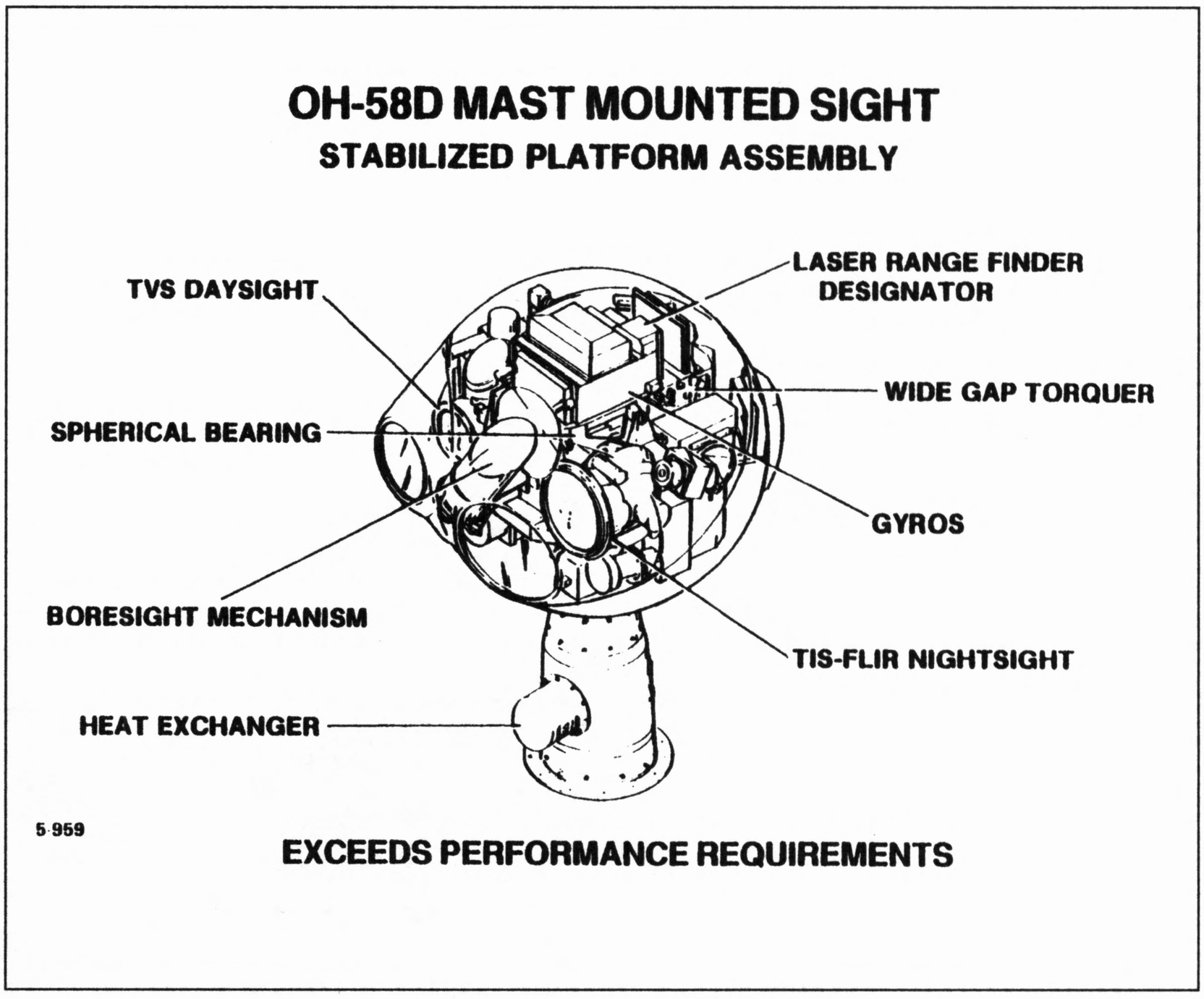


Figure 1.9 The "eyes" of the OH-58D Kiowa

of carrying four Stinger air-to-air missiles, two 7-round rocket pods, a 0.50-caliber machine gun, or some combination of the four weapon systems. All four of these weapons can be aimed using the Kiowa's mast-mounted sight.

The sight itself is located 2 feet above the Kiowa's main rotor. Thus it allows the helicopter to remain hidden behind a hill or structure while using its sensors to locate targets. Once a target is located, the mast-mounted sight is used to designate it with laser energy for artillery fire, Hellfire missiles, or smart bombs.

Usually the mast-mounted sight is operated by the copilot/gunner or by an aerial observer sitting in the Kiowa's left seat. Using a single hand-held grip, the CP/G can change the line of sight and the vertical field of view, turn on automatic tracking of an individual target or of an

area, or acquire a target, determine its range, and spot it with the laser designator. There's even a "freeze-frame" function that can be used to store images for later viewing.

UH-60K/L Black Hawk Assault Helicopter (Sikorsky Aircraft)

The UH-60K/L Black Hawk entered service in 1979 as a replacement for the UH-1 Huey. The Huey, officially designated the UH-1 Iroquois Transport Helicopter, had been used extensively in Vietnam during the 1960s and early

Figure 1.10 Kiowa launching Hydra 70 rockets



1970s for hauling cargo and troops to and from landing zones.

The Black Hawk serves a similar role in *Gunship 2000*. Several *Gunship 2000* missions of the Tactical Support or Search & Rescue variety will require you to have at least one Black Hawk in your flight. Typical missions include bringing troops or supplies to the battle area, evacuating wounded troops, rescuing downed pilots, and searching for and extracting friendly forces. As many as 11 full equipped troops can hitch a ride in the Black Hawk's spacious cabin.

As impressive as the Black Hawk's ability to haul troops and cargo is the capacity of the Black Hawk's External Stores Support System (ESSS) for carrying weapons. This system, which consists of four-station removable pylons, can be loaded with as many as 16 Hellfire missiles (according to Sikorsky another 16 Hellfires can be carried internally), 4 minigun pods, 8 Stingers, or an impressive assortment of 152 Hydra 70 rockets. In addition, the ESSS can carry mine dispensers and additional fuel tanks to permit extended-range self-deployment up to 1,150 nautical miles.

The Black Hawk is designed to perform well in demanding 4,000-foot elevations and 95° F temperatures (1,200 meters, 35° C), and it can operate as well both in desert climates such as that of the Middle East and in extremely cold locations such as Antarctica. Also, the UH-60's built-in tolerance to small-arms fire and to most medium-caliber high-explosive projectiles, and its specially designed airframe and landing-gear features, give it a high degree of battlefield survivability.

Avionics in the UH-60 Black Hawk includes a full suite of communications-systems navigational flight aids, including an advanced AFCS subsystem, and survivability systems. UHF satellite communication is also available. Its IR signature is reduced by the hover infrared suppressor system (HIRSS).

Black Hawk variants in the field or under development include the EH-60A electronic warfare aircraft, the MH-60K



Figure 1.11 Black Hawks bringin' in the troops



Figure 1.12 "Thanks for the lift!"

special operations aircraft, the UH-60M advanced Black Hawk, the VH-60 federal executive helicopter, the U.S. Air Force's MH-60G Pave Hawk, and the U.S. Navy's Sea Hawk family of helicopters. Black Hawk helicopters are flown by National Guard units in eight states, and are used by the governments of several foreign nations.

RAH-66A Comanche Gunship/Scout Helicopter
(Boeing Defense and Space Group and Sikorsky Aircraft)

While *Gunship 2000's* Black Hawks, SuperCobras, Defenders, and Kiowas are descended from Vietnam-era choppers and have their roots firmly planted in the past, and the Apache represents today's state-of-the-art attack helicopter, the RAH-66 Comanche is truly a glimpse into the next century. From its five-bladed bearingless main rotor, to its integrated Fantail anti-torque system, to its sleek, all-composite airframe, the Comanche is unlike any previous combat helicopter.

Not only will the Comanche have a futuristic outward appearance, it will also feature one of the most sophisticated avionics packages ever developed. The Comanche pilot and CP/G will use an advanced Aided Target Detection and Classification (ATD/C) system that will more accurately identify and prioritize targets. This will allow the Comanche to pick up targets at a 45 percent greater range and in 95 percent less time. Also, the ATD/C will be better able to discriminate between real and false targets. According to some reports, cardboard mockups of Scud missile launchers were a source of aggravation for American pilots during the Gulf War.

An improved version of the digital mapping system used in the F-117 will be available on one of the Comanches. The display can show terrain features, the locations of friendly forces, bases, FARPs (forward arming and refueling points), and known enemy positions in a choice of scales that includes close-up viewing. Preplanned mission routes with several waypoints can also be displayed.



Figure 1.13 RAH 66 Comanche: Recon/ scout chopper of the future

Another design feature of the Comanche that looks toward the future is its sealed, pressurized cockpit, which is designed to protect the two-man unit from nuclear, chemical, and biological contaminants. Also, visors in the helmet display systems are made to protect the crew members' eyes from lasers.

During the current demonstration/validation phase of the Comanche's development, only three prototypes are scheduled to be built. Further, the first flight of an actual RAH-66 isn't scheduled to take place until August 1995. By October 1997, the government will decide whether to give the project the go-ahead, and it will likely be 2001 or later before the RAH-66 Comanche is in full production.

Eventually, however, it is hoped that the Comanche will be able to replace 3,000 AH-1, OH-6, and older OH-58

helicopters, which are becoming technologically obsolete and increasingly expensive to keep operational. According to the Boeing Sikorsky team in charge of the Comanche's design, it will take only 1,300 Comanches to replace the aging choppers, and the new Comanches will cost 40 percent less to operate and support.

PART 2

Basic Training

All right now, listen up! I'll assume that you're here today because you want to learn how to become an ace *Gunship* pilot. Well, let me warn you here and now that the road ahead is not an easy one. To successfully pilot an attack chopper in combat you'll need a variety of skills. First, you must learn how to maintain complete control of your helicopter in flight. Whether you're called upon to bring the awesome firepower of an Apache to bear on a column of T-80s, or simply need to get a Black Hawk full of reinforcements to the front, your chances of coming back in one piece are directly related to your skill as a pilot.

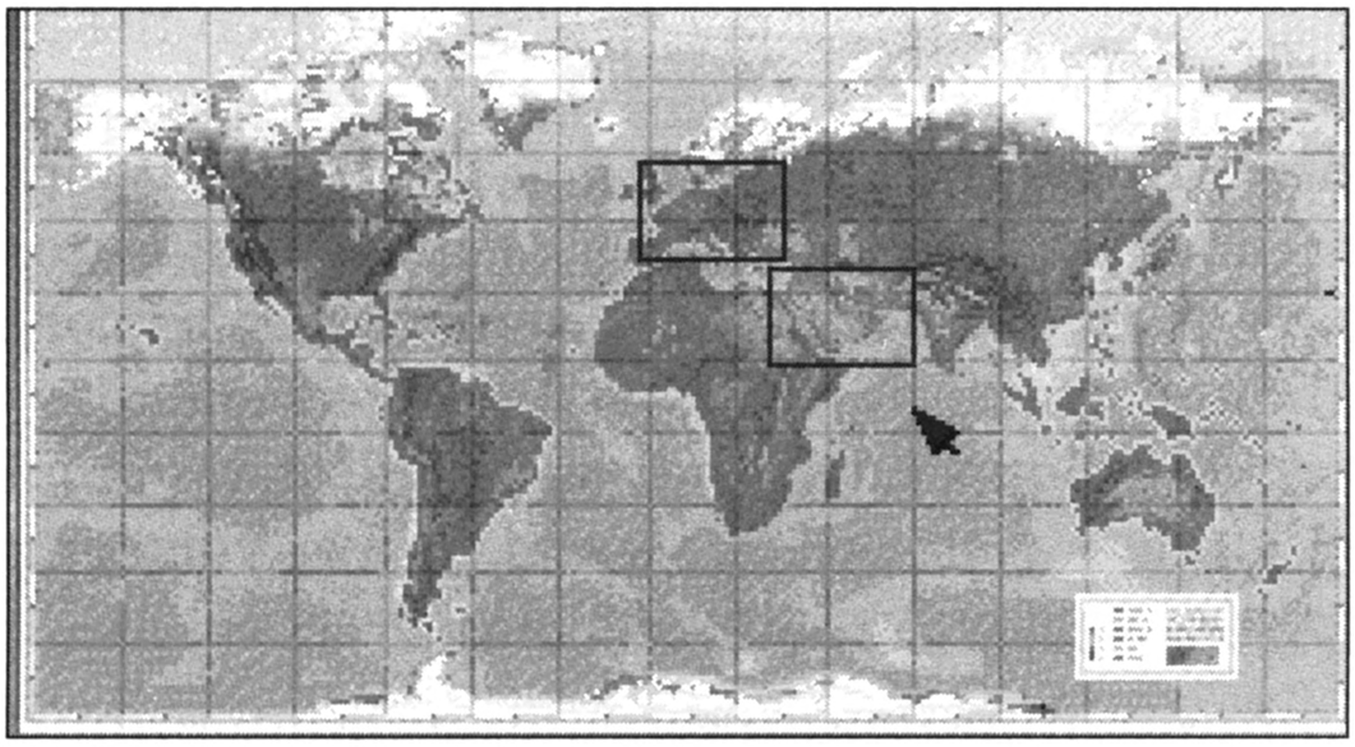


Figure 2.1 *Gunship 2000* "Hot Spots"

Next, you'll need to fully understand the capabilities and limitations of the various weapon systems that are available. Anyone can bring down an Mi-24 with an AIM-9 Sidewinder, but what if Sidewinders are in short supply and you forgot to pack any Stingers? Which Hydra 70 rocket will do the trick? When's an M247 better than a Hellfire? Where is a minigun pod actually more devastating than a Maverick? Your decisions at the armorer's tent can mean the difference between a successful mission and one that leaves you defenseless against the enemy.

Before I'm through with you, you'll also learn the fine art of navigation. Believe me, there's a lot more to navigating a gunship than just setting a few waypoints and flipping the autopilot switch. Whether your mission takes you to Central Europe, the Persian Gulf, the Philippines, or Antarctica, you'll need to know how to use the region's natural terrain features to your advantage.

Next, you'll study combat tactics. Now don't worry. I'm not going to try to teach you a lot of fancy maneuvers named after World War I pilots who never even lived to *see* a modern attack helicopter, let alone fly one. What I'm talking about here is just some very direct methods for delivering maximum punishment to your enemies while avoiding major damage to your person or, more important, to that $10 million piece of military hardware you've been entrusted with. You'll master techniques like ripple-firing to minimize your exposure time while launching conventional Hellfires, and using your mast-mounted sight to target enemies while your chopper is safely hidden behind the nearest hill.

When I think you're ready, you'll take a little training flight—either in the Middle East, or in Central Europe. (If you're really ambitious, you may want to sign up for both). Even though you'll be battling simulated enemies in an indestructible chopper, your adrenalin will start pumping as you track down your objectives and deliver your ordnance using everything you've learned in flight school.

Finally, we'll sit back to watch the films of your training flights, to see where there may be some room for improvement. When you leave here you'll be ready for actual combat missions against the toughest, best equipped forces the other side has to throw at you. What's more, you'll be on your way toward becoming a commissioned officer and commanding your own multi-helicopter flights.

FLIGHT SCHOOL

Talking to Your Chopper

Flying a helicopter is a lot like having a good conversation. You must understand how to use the helicopter's controls to communicate your intentions to the chopper, but you also have to be willing to listen attentively to what the machine is trying to tell *you* through its various gauges and indicators.

The three main controls you'll need to master are the collective, the cyclic, and the tail rotor. In a real helicopter, the collective is a lever on the pilot's left that is similar in appearance to a hand brake; the cyclic is controlled with a separate joystick on the right. Once airborne, the pilot makes most altitude changes through direct manipulation of the cyclic, *not* by continuously adjusting the collective. Usually, the tail rotor is controlled by using the pedals. In some helicopters such as the Apache, however, control of the tail rotor can be integrated with the cyclic. Thus some early critics of *Gunship 2000*, who complained that the first release lacked realism because pedals weren't included as a control option, weren't entirely justified.

With the second release (Version 469.03; see Upgrade Table), pedal control of the tail rotor was added, as were a variety of other setups (one joystick, two joysticks, joystick and keyboard, joystick and pedals, etc.). The control configuration you use will largely be a matter of personal

preference. I do, however, recommend that you select a configuration (e.g., dual joysticks, joystick/keyboard, or joystick/rudder pedals) that lets you control the tail rotor independently of the cyclic, because this allows you more precise control over the helicopter and a much tighter turning radius.

Using pedals to control the tail rotor can add a degree of realism to the simulation, but if your computer system doesn't have them, joystick and keyboard provide an excellent alternative. Some *Gunship* pilots may opt for the dual-joystick configuration, but I reason that as long as you've got to keep a free hand close to the keyboard anyway (to use your ECMs, bring up the GPS map, and so forth), you might as well use the keyboard for control of the collective as well.

The collective is actually a combined control that lets you simultaneously adjust the engine throttle and the pitch of the rotor blades. Thus, by increasing the collective you're increasing both the vertical *lift* of the helicopter and/or its potential horizontal *thrust*.

The cyclic, on the other hand (no pun intended), lets you tilt the entire rotor configuration in the direction you want the helicopter to move. To move forward, you push forward on the cyclic. To bank left or right, you lean the cyclic in the appropriate direction. You can even fly backwards by pulling back on the cyclic. Hovering is simply a matter of adjusting the cyclic so that all thrust is aimed straight up (and therefore becomes pure lift), and adjusting the collective so that lift and gravity cancel each other out.

It's these close relationships between lift and thrust, cyclic and collective, that make flying a helicopter—well, interesting, to say the least. To achieve level flight you must carefully adjust both the collective and the cyclic to maintain a delicate balance between the two forces of lift and thrust.

If you've studied the early development of the helicopter, you know that things never really got off the ground (pun intended) until the tail rotor was developed.

The tail rotor serves to counteract the tremendous torque created by the main rotor. If you ever get your tail rotor blown off (or even seriously damaged) by a SAM, you'll instantly acquire a new understanding and appreciation of its function.

Like the rudder of an airplane, the tail rotor not only serves to stabilize the aircraft during flight, but also plays an active role in turning the chopper. As an experiment, take one of the *Gunship 2000* choppers for a little spin. Once you achieve level flight with an airspeed of at least 80 knots, try maneuvering the helicopter in a 360-degree turn using only the cyclic. Notice how long it takes to complete the turn. Now try the same turn using just the tail rotor. Finally, combine the cyclic and the tail rotor. In most cases, by combining the two controls you'll almost halve the time it takes to make the turn using either control by itself.

Because there are many times during combat when an abrupt about-face is the only thing that will let you live to fly another day, it's imperative that you learn to combine the cyclic and the tail rotor to turn as quickly as possible.

Remember also that a heavy hand on the cyclic can cause the chopper to bank steeply, which, in turn, can cause you to drop like a rock if you don't increase the collective to compensate for the loss of lift. While there will be times when losing altitude quickly is to your advantage (such as when you're trying to shake a missile's radar or IR lock), an unexpected plummet can be disastrous when you're already skimming the treetops.

Unfortunately, even if you have perfect hand-eye coordination and excellent motor skills, other variables can make flying difficult. Two things that can dramatically affect your ability to accurately control your chopper are the type of joystick you use and the processing speed of your computer.

First, get yourself a strong spring-loaded joystick that isn't overly sensitive and that consistently returns to neutral when released. Avoid joysticks that drift and require

frequent recalibration. Since you'll often need a free hand to enter keystrokes, try to get a joystick with suction cups on the bottom so it can be operated with one hand. I use a pistol-grip model that has Button #1 as its trigger and Button #2 under my thumb. Thus I can fire my weapons and select among various targets while climbing, diving, or turning.

As for processing speed, I've played *Gunship 2000* on a 12-MHz 286 and on a 386DX running at 40 MHz. Neither speed is ideal. At 12 MHz the simulation is definitely more manageable—particularly if you lower the level of graphic detail (Alt-D) or change the cockpit style (Alt-S) to increase the simulation speed. The problem with a slow processor is that it tends to make the animation jumpy and, because it takes longer for a slow computer to respond to your joystick and keyboard input, it's easy to over-control and end up chasing your gauges.

On the 40-MHz machine, on the other hand, the animation was incredibly fluid and the response to all controls was virtually instantaneous. However, when flying against Crack or Elite troops, the response to any encounter was so quick that before I could identify the target and select an appropriate weapon, IR-guided missiles were already closing in on me. Thus, while *Gunship 2000* "looked" fantastic on a superfast machine, it accelerated only my enemies' reaction time, while doing nothing to speed up my own "internal processor."

Listening to Your Chopper

The first time you step into the cockpit of a modern military helicopter such as the AH-64 Apache or AH-66 Comanche, you may be slightly bewildered by the number of gauges and indicators staring you in the face. However, if you think about it, there are almost as many displays on the dashboards of many of today's cars. In both cases, the trick is to understand not only the functions of all the displays, but also their relative levels of importance so that you can

appropriately allocate your attention among them.

For example, when you're driving down the highway, there's no need to constantly check your oil pressure or keep one eye on the indicator that lights when your windshield-washer fluid is low. Similarly, many of the gauges and indicators in the cockpit of your helicopter need only occasional attention. What's more, many of the visual warnings you'll receive are accompanied by audible warnings—that alert you, for example, when your altitude is dropping below the low limit you've set, or when you're being closely pursued by a SAM or tracked by radar or infrared targeting systems. In addition, your copilot will let you know when you're running low on fuel, so there's no need to constantly check the gas gauge.

So where should your attention be focused? Well, because NOE (nap-of-the-earth) flying is the only thing that will save your butt in most combat situations, the single most important gauge in any chopper is the radar altimeter, located on the right side of your HUD (heads-up display). Start losing altitude too quickly and they'll be digging your chopper out of a sand dune. Inadvertently drift up over the 200-foot mark, and you'll be a sitting duck for enemy SAMs. This digital gauge shows your altitude in feet, and even indicates your low limit with a red line. Because this display gives such a clear indication of your rate of climb or descent, it virtually eliminates the need to look down at your VSI (vertical speed indicator).

Notice also that the HUD altimeter always gives your true distance above the ground (or water) directly below your helicopter, and *not* your elevation above sea level. Thus, if you maintain level flight but begin to pass over a hill, your relative altitude will start to drop. Also, if you should cross over a river, your altitude will increase by 114 to 118 feet—the distance between the water and the surrounding terrain.

If your HUD becomes disabled during combat, it's important to remember that although you can still use the

digital barometric or pressure altimeter in your cockpit, it doesn't adjust for terrain features as does the HUD radar altimeter. Therefore, you have to be even more diligent when flying over low hills, or even structures. There's nothing more frustrating than having a beautiful mission ruined by catching a rotor blade on the air tower as you're about to land back at your base. Even though you'll probably survive the crash, your incompetence probably won't go over big with your commanding officer.

The second most important instrument in the cockpit is the threat display. Often, enemy positions far off to the left or right of your helicopter will reveal themselves on the threat display as small red dots before they're acquired as targets on the HUD, or are announced by your IR and radar tracking warning systems. When flying against Crack or Elite troops, even an extra second or two to respond to a threat can determine who gets the first shot off and, therefore, who survives the exchange.

Another thing that's important to keep in mind about the threat display is that each blip represents only the last *known* position of an enemy target. Fast-moving targets, such as fixed-wing aircraft, can often be several klicks away from their last blip position. If a jet or helicopter on the threat display appears to pull over and park, you can be pretty sure it's flown out of range.

Other cockpit instrumentation includes a compass and an ASI (also displayed on the HUD), an artificial horizon (if you can't tell which way is up by looking out the window . . .), a fuel gauge, engine gauges, digital readouts of the number of remaining chaff canisters and flares, a display showing the currently armed weapon along with the number of rounds, rockets, or missiles you have remaining, and a bank of system status indicators.

There are 10 system status indicators in the Apache (fewer in some of the other helicopters). Each is labeled with a three-letter abbreviation indicating the system it represents. If a system status indicator turns yellow, it

means that the corresponding system is damaged but still functional in a limited capacity. If the tail rotor indicator (TAL) is yellow, for example, you'll still be able to steer the chopper using your tail rotor control, but the helicopter will tend to pull to the left or right, like a car in need of a front-end alignment. A damaged cannon (CAN) can still be fired, but its responses to your trigger squeezes will be intermittent.

A red system status indicator means that the system is totally out of commission. If your port or starboard weapons wing indicator (PTW or SBW) turns red, you'll instantly lose access to any unfired missiles or rockets remaining on that wing. After four systems go into the red, another hit could send you crashing to the deck.

Easy Versus Realistic Flight

Everyone out there who prefers to play *Gunship 2000* using the Easy flight mode, stand up. *You're dismissed!*

Wait a minute. Before you leave, just tell me what you have against Realistic flight. Is it too difficult? Do you feel as if your chopper will just drop out of the sky the first time you need to make an evasive maneuver? Or are you just thrilled with mediocre scores and slow career advancement?

All right, sit down. I have to confess that it took me a while to get over my fear of Realistic flight mode. I mean, at some collective settings my Kiowa would feel about as stable as a leaf in a strong October wind. The trick is simply to set your collective at the proper setting, then fly the helicopter using gentle adjustments to your cyclic and tail rotor.

Realistic flight is really not that bad. Anyone who remembers with dread the Realistic mode from the original *Gunship* should be comforted by the fact that Jim Day and Darrell Dennies shared that same dread. They decided from the outset that they would make *Gunship 2000's* Realistic mode a lot more manageable.

Achieving Level Flight

During flight, you'll want to maintain a constant altitude and an airspeed of between 100 and 120 knots. As noted above, the key to stable flight is your collective setting. No matter which *Gunship 2000* chopper you select for your mission, you should easily be able to stabilize the helicopter and achieve level flight by setting the collective to around 75 percent full as you first lift off from your base.

After engaging the rotor (9), the exact number of times you'll need to hit the Collective Up Fast key combination (Shift-=) will vary according to the helicopter you're flying, the size of your load, and, to some degree, the air temperature. As a general rule of thumb, however, for most fully loaded choppers you'll have to press Collective Up Fast about six times. Light helicopters may only require five key-presses, and a Black Hawk armed to the teeth with a full weapons load will take around seven key-presses.

Once you've pressed Collective Up Fast an appropriate number of times, begin to gently push forward on the cyclic to slow your ascent and to begin moving the chopper forward. (If you've already set a waypoint, you can use your rudder controls to steer toward the INS indicator pip.) As you begin to move forward and pick up speed, translation lift will continue to push the helicopter skyward, particularly when your airspeed is between 70 and 90 knots. However, once your airspeed passes 100 knots, translational lift should drop off and you should be able to stabilize your altitude by gently nudging the cyclic backward and forward.

After you've stabilized your altitude, try pushing the cyclic forward slightly. You should begin to lose altitude, but at a manageable rate that's easy to control. Pull back gently to level off; then pull back slightly again to begin climbing. If the collective is set properly, you should be able to increase or decrease the helicopter's altitude in a controlled manner using only the cyclic. If you find that slight adjustments to the cyclic cause the chopper to

plummet, you may want to *decrease* the collective slightly (⊟). This is important, because the natural tendency would be to *increase* the collective to gain more lift. However, too much collective is more likely to cause unstable flight than too little collective. Usually a low collective setting simply results in slower airspeeds.

It's important to remember that during a mission, the total load of your chopper will decrease as you burn fuel and expend ammunition and ordnance. This will usually result in slightly faster airspeeds, but in some cases could cause the helicopter to gain altitude or lose stability. If you find that it's harder to make controlled altitude changes as your mission progresses, try decreasing the collective slightly (⊟).

On the Comanche, the position of your landing gear and weapons bay doors can also affect your airspeed and the chopper's response to cyclic adjustments. Thus you should be sure to retract your landing gear soon after takeoff and before attempting to level off. Also, if you decide to keep the weapons bay doors closed while traveling to your objective in order to reduce the Comanche's radar signature, just be aware that when they are opened, your airspeed may change, or you may begin to lose or gain altitude.

ARMING YOUR CHOPPER

A key element of any successful mission is careful weapon selection. Your decisions concerning what weapons to bring along should be based on several pieces of information, such as the types of targets you are likely to encounter, the setting in which your battle will take place, whether or not there is a conveniently located FARP where you can rearm during the mission, and the maximum load capacity of the helicopter you'll be flying into battle. During a campaign, you may also be faced with shortages of certain weapon systems, which will force you to make do with what's available.

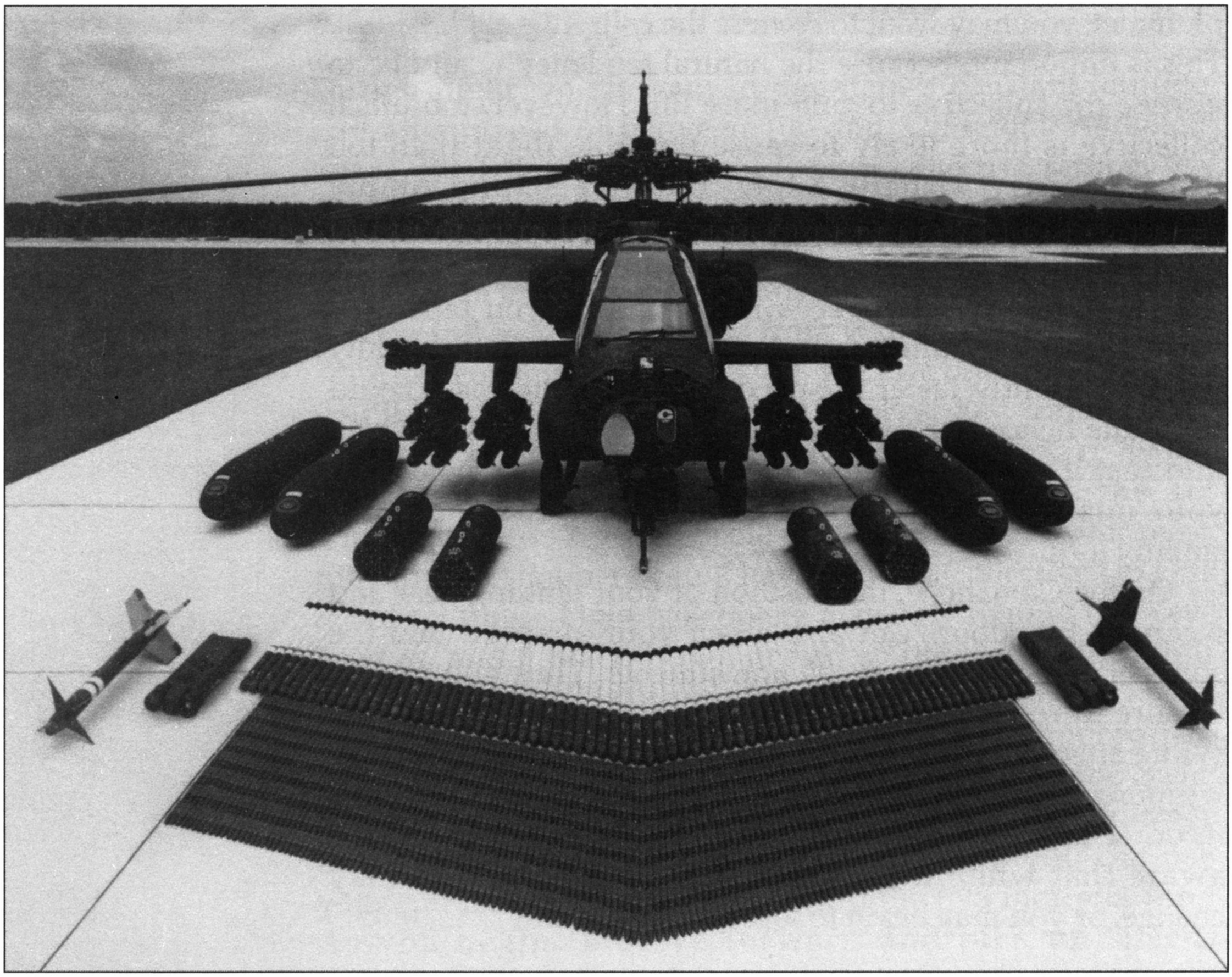


Figure 2.2 The Apache's arsenal

Do Your Homework

Until you get out there and take a good look around, your only sources of information on the composition of enemy forces are your mission orders and the S-2 report. For point attack or search & destroy missions, your mission orders will describe your primary and secondary objectives in general terms. Typically, you might be ordered to locate and destroy a Fixed Emplacement, Mobile SAM Site, Command Post, Bunker, Depot, BMP-1 Platoon, Headquarters, Oil Refinery, Airfield, or Artillery Site.

While some of these terms are more descriptive than others, none of them tells you exactly what kind of welcoming committee you'll find waiting for you when you arrive. However, you should be able to determine from your orders whether or not most of your targets are likely to be heavily armored. Also, as you gain experience, you'll develop a sense of what kind of supporting units you'll find at various types of installations.

Your S-2 report, on the other hand, will specifically list four target types that have been observed in the area, as well as the level of enemy air activity and the types of aircraft that have been spotted. You may be told, for example, that BMP-1, BTR-60, infantry, and BRDM units have been sighted, that enemy air activity is heavy, and that Mi-24 Hinds have been seen in the area. Although the S-2 report is never completely accurate, it should give you a good idea of what types of forces you'll be up against.

It's important to realize that the order in which the enemy target types are listed in the S-2 report reflects the frequency with which they're found. For instance, in the example above, because BMP-1 is the first unit listed, you should expect to encounter more BMP-1s than any other types of supporting units. Likewise, there are likely to be fewer BRDM units than any other target type listed.

Once you have this information, you should turn to Table 3 in Part 4 of this book. Here you'll find information on nearly every type of enemy target you'll have to face during your career as a *Gunship 2000* pilot. The table divides targets into four groups: vehicles and other ground forces, structures, air targets, and naval targets. Within each group, enemy units are listed alphabetically, along with the degree to which each is armored, the types of weapons they carry (including their ranges), their guidance systems, and the best and worst weapons to use against them.

If these data look familiar, that's because they're the same data you see onscreen when you pause the simulation (Alt-P) after acquiring a target. I compiled the table because

it's important to be able to study this information and have it available when you're actually selecting weapons. After all, if you didn't strap a couple of Sidearms onto your wingtips before taking off, it won't do you much good to learn that this is the best weapon to use against the SA-11 that has suddenly appeared on your threat display.

In all cases, there will be several "best" weapons listed for a particular target. In the example above, the BMP-1, BTR-60, and BRDM units are all lightly armored vehicles and are best disposed of by using your cannon, M-247 rockets, TOW-2, Hellfire, or Helstreak missiles. However, only two of these weapons—the cannon and the Hellfire missiles—are likely to be effective against the infantry units that are also reported to be in the area. Therefore, you'd probably want to pack some Hellfires for such a mission.

Since the S-2 has described enemy air activity as extremely heavy, you may want to bring some Stingers as well. I would consider these optional, however, since enemy helicopters, even at the Crack and Elite levels, can usually be outmaneuvered and brought down with two or three blasts from your chain gun or cannon. In any situation where you're likely to face tough radar-guided AA weapons (such as the 2S6, found in Central Europe), go with Sidearms rather than Stingers.

Packing for the Trip

Certain weapon choices may seem obvious, but there are usually alternatives worth considering for any anticipated encounter. For instance, don't automatically reach for Penguin-3 anti-ship missiles whenever one of your objectives is a naval group. TOW-2 missiles, as well as both types of Hellfires, can be used with some success against naval targets, and you can carry a lot more of these than you can Penguins. Good thing, because if you're using TOWs or Hellfires, you'll probably need two or three of them to do the job. You should also consider using Mavericks against

naval targets. Their range is only 25 klicks, compared with 40 for the Penguin, but it's usually impossible to acquire a naval target at more than 25 km anyway. Ships are often found close to the coastline, and flying high enough to allow long-range acquisition would expose you to all kinds of land-based threats. Mavericks have one other advantage over Penguins: unlike the Penguins, Mavericks can also be put to good use against land-based targets if you don't end up using them against ships.

Also, even if enemy air activity is reported to be heavy, you don't necessarily need AIM-9L Sidewinders or AIM-92 Stingers on your wingtips—particularly if you're worried about radar-guided SAMs and feel you should reserve your wingtips for AGM-122 Sidearm anti-radiation missiles.

Remember, most helicopters can be shot down using M-255 rockets, both types of Hellfires, Helstreaks, and even cannon or machine-gun fire at close range. The only time you should definitely bring Sidewinders is when there's a good chance you'll be running into enemy fixed-wing aircraft.

Since so many targets can potentially be destroyed by a wide variety of weapons, it's important to learn as much as possible about the virtues and liabilities of all available weapon systems.

MMW Hellfires are wonderful. They can track down and annihilate a moving T-80 from 8 klicks away and are true guided fire-and-forget weapons. Unfortunately, they can only be launched from a Longbow Apache, and you won't get your hands on one of those until you become a Captain. Even when you do get to fly the Longbow, there will be plenty of times during tough campaigns when MMW Hellfires are in short supply.

Likewise, only Longbow Apaches and Comanche Gunships are equipped to carry Helstreak missiles. Helstreaks are similar to AGM-114A Hellfires both in the types of targets they can be used against and in the guidance systems they employ. Helstreaks have a slightly longer

range, however, and can reach the target much faster than a Hellfire. If you're flying a Comanche and have to choose between conventional Hellfires and Helstreaks, take the Helstreaks every time.

Often your primary arming choice will be between standard AGM-114A Hellfires and Hydra 70 rockets. Standard Hellfires can blast through the toughest armor, and have a reasonably good range (6 km). What's more, they don't require you to aim carefully at the target. Just point the chopper in the general direction of your target and you should get a lock.

Hellfires do have a few drawbacks. First, their excessive weight (and the design of the given helicopter) limits the number of Hellfires you can carry. A Black Hawk or an Apache or can carry, at most, 16 Hellfires using both the inboard and outboard stores. SuperCobras can carry eight, and Kiowas can carry only four.

Second, even though Hellfires are guided weapons, their laser guidance system requires you to keep the target designated for the duration of the missile's flight. As discussed elsewhere, ripple-firing techniques allow you to reduce your exposure time while attacking a tight group of targets. However, it's still dangerous to sit in one spot for too long while you're within range of Elite troops.

Hydra 70 rockets are comparatively light, so you can bring plenty of them along with you. For instance, you can carry as many as 76 Hydra 70s on an Apache or a SuperCobra, 38 on a Kiowa, and an astounding 152 Hydra 70s on a Black Hawk. Also, with three distinct types of Hydra 70s available, there's one that's right for just about any job.

There's the M-247 for most armored threats such as tanks, APCs, self-propelled SAMs, heavily armored structures, and so forth; the M-255, with its 2,500-flechette warhead, which is actually the weapon of choice against infantry squads and can even be used effectively against slow-moving helicopters; and M-261s for use against non-armored or lightly armored vehicles, infantry units, and

structures. In addition, Hydra 70 rockets can be launched in salvos of one, two, or four rockets, so you can always use the right number for the job at hand.

These rockets are all unguided, which has both advantages and disadvantages. The main advantage of an unguided weapon is that once it's fired, you're free to turn your helicopter in a different direction, either to acquire a new target or to avoid enemy missiles or gunfire. Thus, in a sense, it's a fire-and-forget system that's cheap and light. Also, the lack of a guidance system makes rockets harder for the enemy to avoid, because they can't be jammed or decoyed with chaff or flares.

However, if a target isn't stationary, there's a chance it can move out of the way before your rocket actually arrives. Another disadvantage is that rockets are harder to aim, because you have to point the entire helicopter directly at the target. This usually means pulling back on the cyclic to raise the gunsight to the level of the target box on the HUD. Therefore, unless you aim quickly, fire, and push your nose down again in a hurry, you can quickly find yourself up over 200 feet being shot at by targets that couldn't see you a minute ago. One option is to hit Collective Down Fast (Shift-[-]) before aiming. Unfortunately, this will give the enemy an extra half-second to take aim at you, and you're likely to gain some altitude anyway.

Finally, rockets have only half the range of conventional Hellfires (3 km, compared with 6 km for the Hellfire). This is usually not a problem, however. Say you usually fly at about 120 feet. Even under perfectly clear conditions, you probably won't acquire any targets until you're within 3 to 3.5 klicks of the enemy anyway. Therefore, it does you no good to have a long-range weapon if you plan to fly NOE.

Two additional weapon systems that can be effective against armored and naval threats are the BGM-71D TOW-2 air-to-ground missile and the AGM-65D Maverick. The TOW-2 is a wire-guided missile with a range of 4 km. Like the Hellfire, the TOW-2 requires you to keep the target designated for the duration of the missile's flight. Thus, if

you're flying a chopper that's capable of carrying either weapon, you're usually better off sticking with Hellfires.

Scouting the Battle Area

Before a mission, you'll also get to look at a map showing the location of your base, your primary and secondary objectives, and your FARP (if there is one). This information can help when you select your weapons. For example, if there's a FARP close to your objectives or if your base is fairly close to the objectives, you'll probably be able to rearm and refuel after you've achieved the first of your two objectives. Thus you can pack fewer of the heavier weapons initially, knowing that you can always get more. Also, if your objectives aren't too far from your home base, you may be able to cheat on fuel slightly to squeeze on a few more missiles.

Terrain should also be considered, however, because, as noted above, long-range weapons do you absolutely no good if you constantly find yourself in short-range confrontations. Although it's sometimes hard to tell from the high-scale map whether your objectives are in open terrain or are safely nestled among hills, you should make your best guess and factor this information into your decision.

Targets in the open are easy prey for most long-range weapons, and rockets can be deadly when launched by a chopper popping up from behind a nearby hill. In the urban area of Central Europe, even SUU-11B/A and GPU-2/A minigun pods can wreak havoc, because targets are always turning up at close range.

Losing Weight

If you load up on missiles and rockets, only to find that your chopper has developed a slight weight problem, there are a few steps you can take to shed a few ugly pounds. First, as mentioned above, if your objectives are close to your base or

if there's a FARP where you can refuel during the mission, you can decrease your initial fuel supply. Remember, however, that when you do refuel, you'll only end up with as much fuel as you started with—*not* with a full tank.

Second, if you're only slightly over the max, you might consider leaving some of the ammo for your chain gun or cannon behind. If you're a long-range kind of fighter, and usually return from a mission with half your ammo supply unspent, you've got nothing to lose by taking less to start with.

If you're like me, you've probably been tempted at one time or another to substitute offensive weapons for the defensive chaff and flares. Unfortunately (or perhaps fortunately), you're only allowed to adjust the proportion of chaff to flares—not to decrease the total number of stores (60)—and in this simulation, chaff canisters and flares weigh the same.

Here again, however, the information in your mission orders and in the S-2 report can be used to help you at the armorer's tent. If you see that most of the targets you'll probably face tend to pack IR-guided weapons, you might want to shift the balance in favor of flares rather than chaff.

In the earlier example, because BMP-1, BTR-60, and infantry units all usually carry IR-guided SAMs, I'd select a ratio of at least three to one in favor of flares. This is easily done by clicking on INCREASE FLARES five times until the score reads CHAFF - 15, FLARES - 45. Likewise, if you expect to encounter more weapons with radar-based guidance systems, you should take along more chaff canisters than flares. Finally, remember that if you're being tracked optically or by laser-guided weapons, the only countermeasure is to get out of the enemy's line of sight.

Weapon Selection for Multi-Helicopter Flights

Everything we've discussed so far—studying your mission orders and S-2 report, terrain considerations, FARP location, and so forth—is just as important whether you're flying a

single-helicopter mission or are in command of an entire flight. When you're in command of a multi-helicopter flight, however, you have added flexibility in your choice of weapons, because you can let different helicopters within a section arm with complementary weapon types.

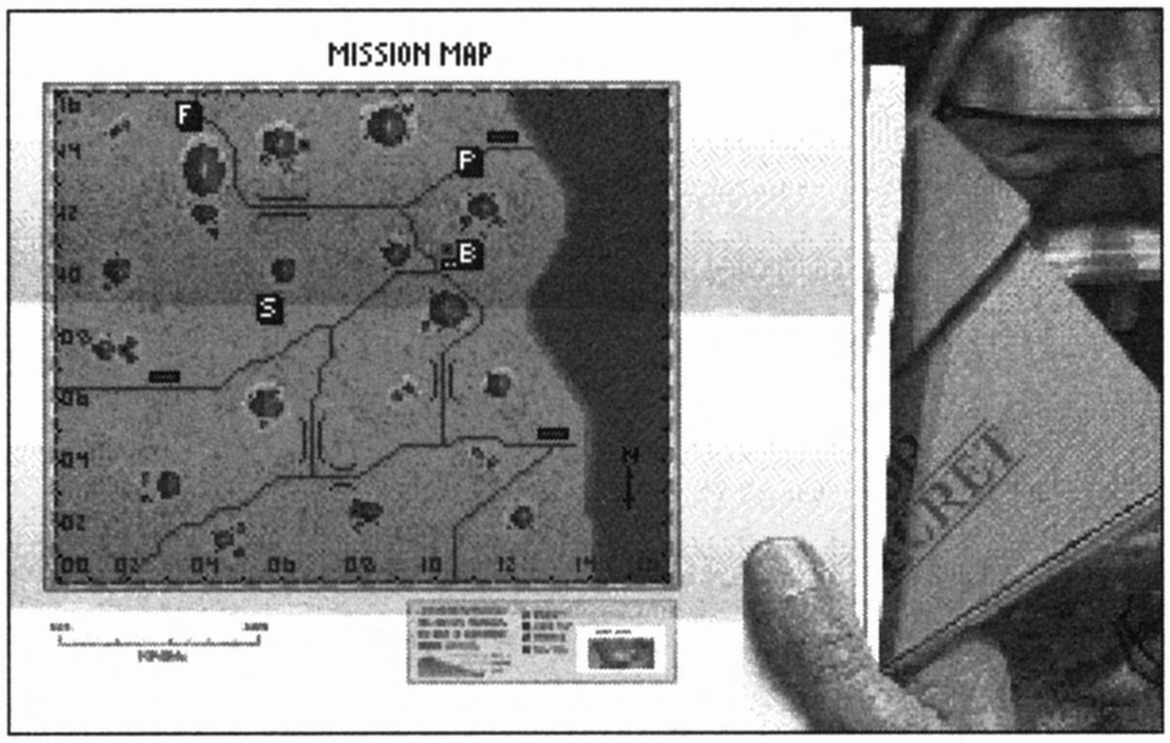
For example, let's say you're the flight leader of a heavy section consisting of three Apaches on an S & D mission with an enemy bunker as your primary objective. The S-2 warns of SA-11 Gadflies, BMPs, ZSU-23s, and infantry units in the area. Enemy air activity is reported to be extremely heavy. You could start by stocking your own chopper with 16 Hellfires and strapping 4 Stingers on your wingtips. Then equip the other two helicopters with 8 Hellfires and 38 Hydra 70 rockets each. However, give one Apache M-247s, and the other M-261s. Finally, arm these two choppers with Sidearm missiles.

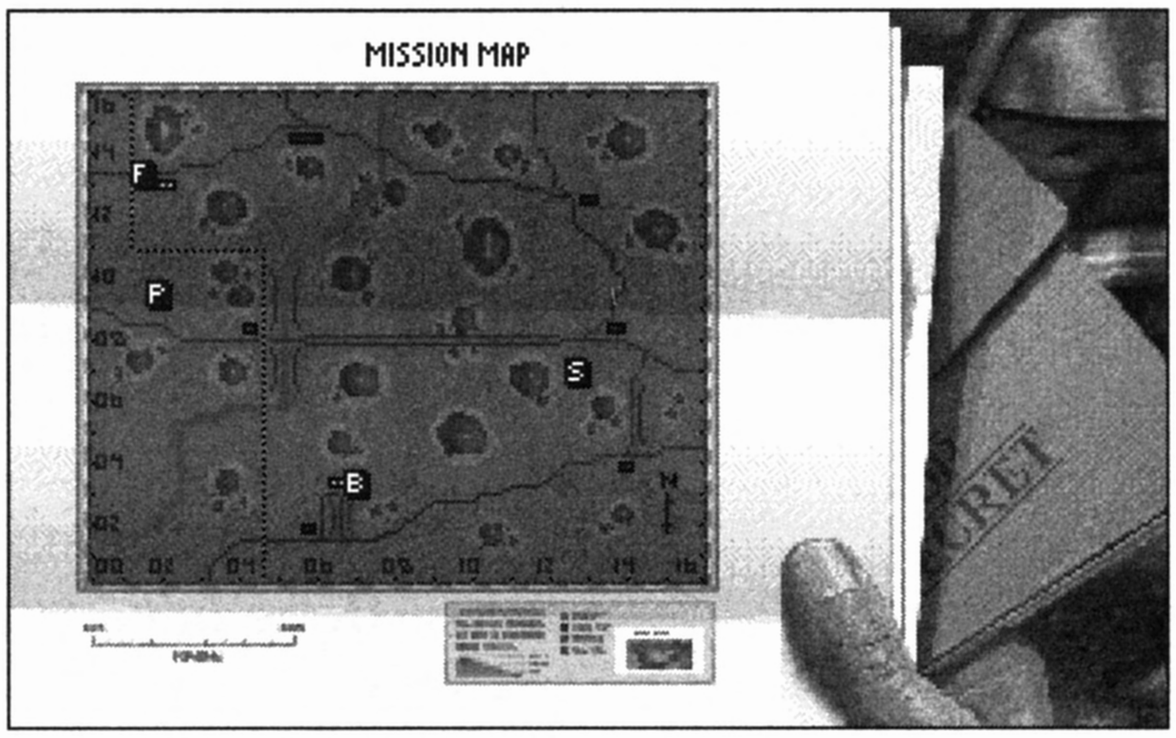
Using this configuration, you should be able to personally eliminate most of the air and ground threats you encounter on your way to the objective, and, once you get there, your boys can go in and destroy all SAMs, structures, or pieces of armor that are unlucky enough to get in your way.

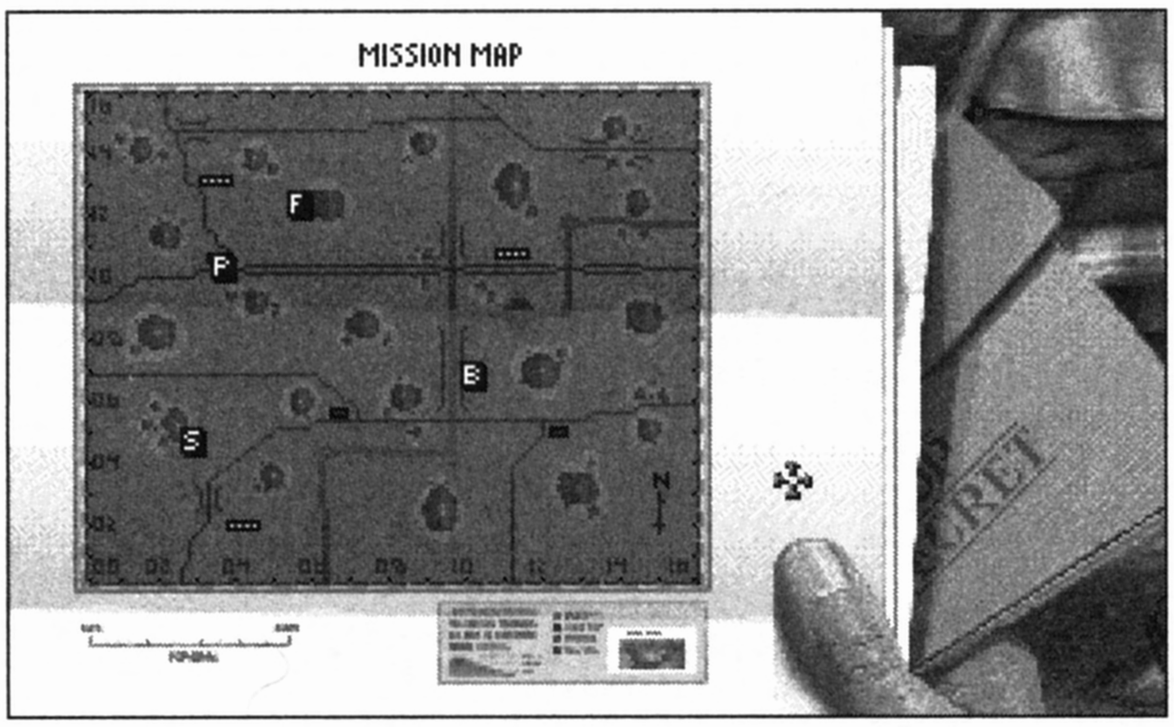
NAVIGATION

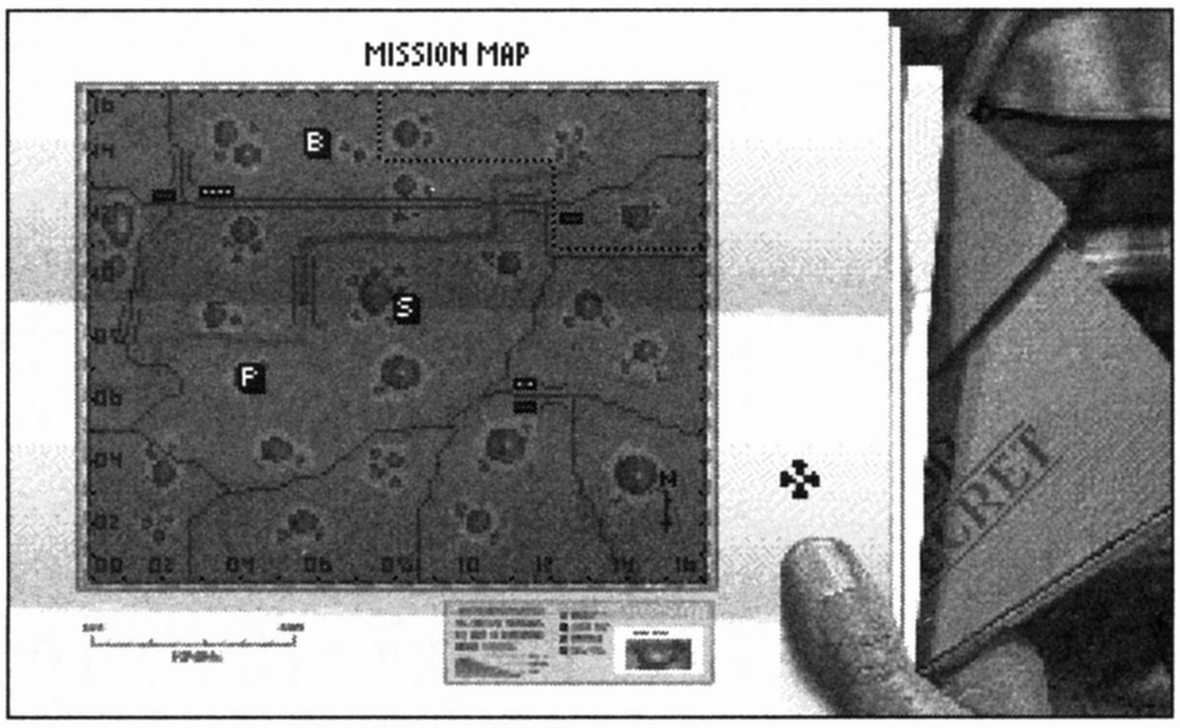
Gunship 2000 features six different mission areas, divided equally between Central Europe and the Persian Gulf. The optional Mission Builder disk adds one new mission area to each theater (an urban area in Central Europe, for example), and two new theaters—Antarctica and the Philippines. Each mission area represents approximately 800 square kilometers, and is divided into 256 sectors using a coordinate system based on a 16 x 16 grid; the lower left-hand corner of the map is 0/0 and the upper right-hand corner is 16/16.

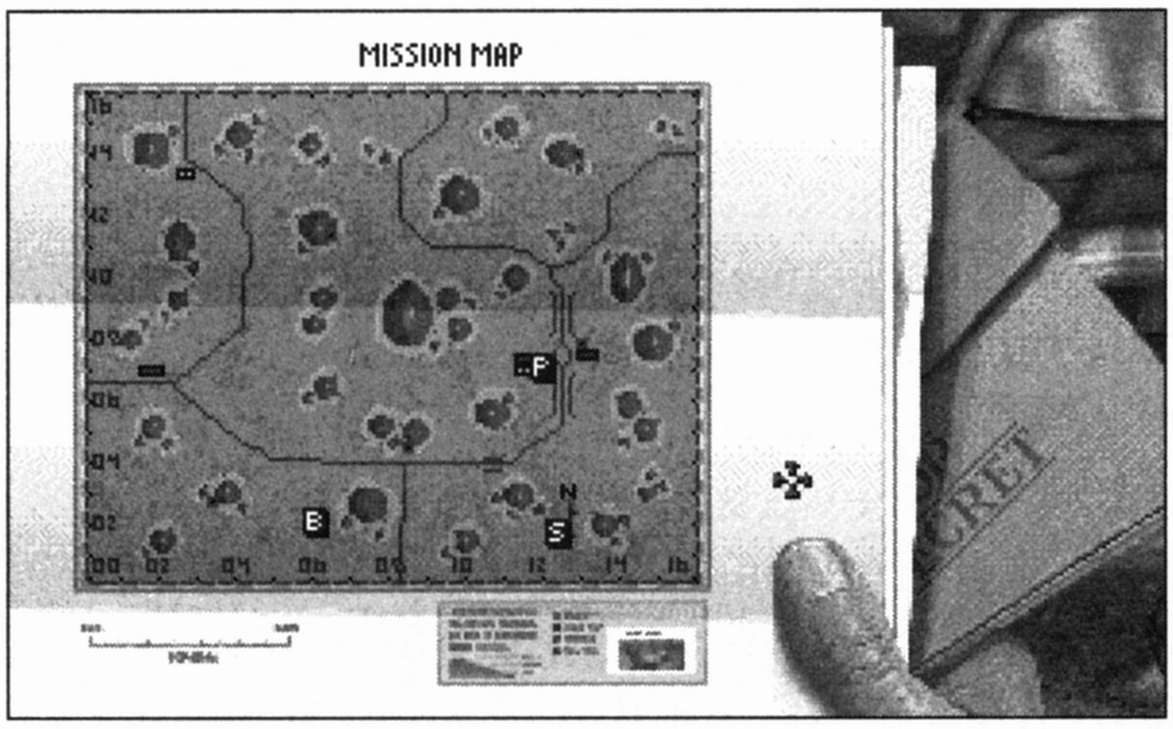
The mission map you're shown during the pre-flight











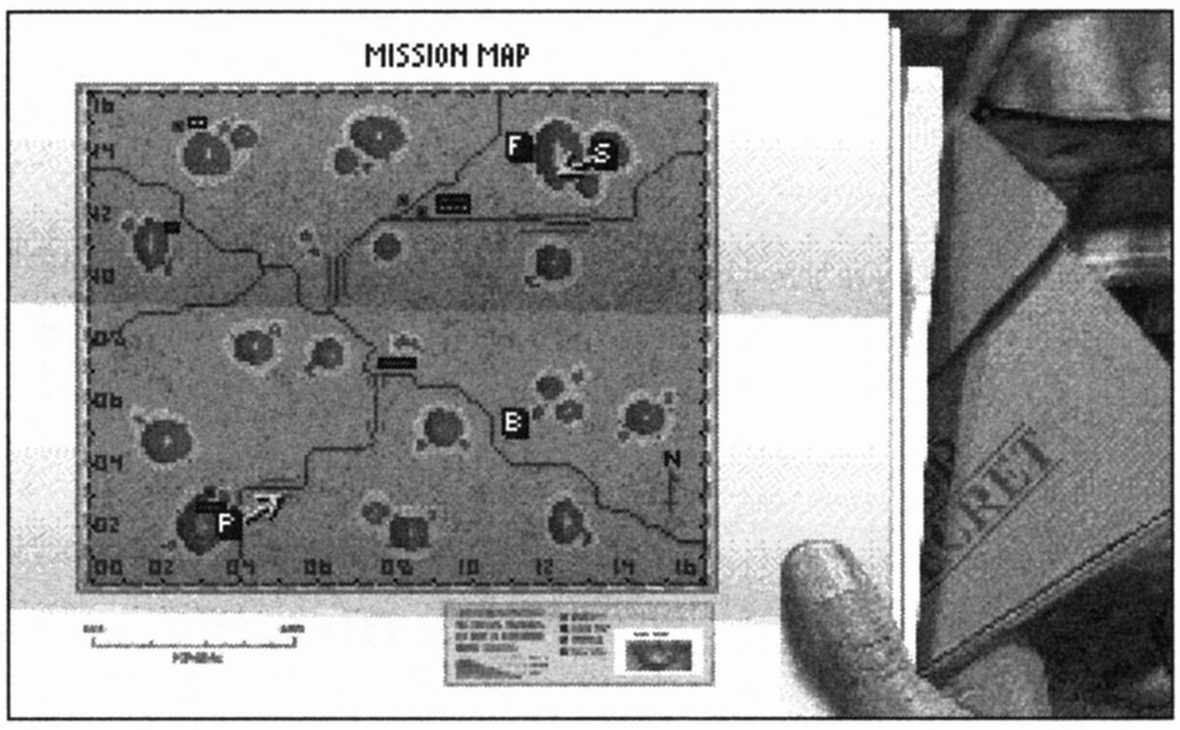


Figure 2.3 The mission areas of Central Europe and the Persian Gulf

briefing will give you a general idea of where your base and objectives are located. In addition, the map shows all major terrain features, structures, and installations within the mission area, such as rivers, roads, mountain ranges, airfields, and bridges. It's important to remember, however, that the map you see during the briefing is a high-scale map and its accuracy, particularly with regard to moving objectives, often leaves a lot to be desired.

Though the mission map can be of some use in determining the types of weapons you should carry and the amount of fuel you'll need for the mission, you won't be able to actually chart a course until you climb into the cockpit of your chopper and call up the GPS map (F10). This can be done once you're airborne, or even before you engage your rotor.

The first thing to look for on the GPS map is the locations of your primary and secondary objectives in relation to your base. If the secondary is closer to your base and is situated between you and the primary, it may make more sense to attack the secondary first.

Once you decide which objective to tackle first, look for some type of covering terrain close to it. Ideally, you won't want to approach the enemy position in a direct line from your base. Chances are that the enemy knows what direction you're most likely to attack from, and has his defensive units positioned to fend off such an attack.

If your mission orders instruct you to intercept a moving objective, such as a BTR-60 platoon, a truck convoy, or a column of T-80s, either plan an end run so you can swoop down on them from behind, or set up an ambush so they roll right into the line of fire. If you're in command of a multi-helicopter flight, as opposed to flying a single-helicopter mission, you may want to try a carefully timed combination of the two tactics, using all five choppers. Coordinate your forces so that as the heavy section opens fire from a designated ambush point, the light section charges in to attack from the rear.

It's important to consider that most enemy units travel at around 25 knots. This means they can cover only about one quarter of the ground that you can (assuming your airspeed is somewhere around 100 knots) in the same amount of time. Keep this in mind as you try to determine the best place to set up an ambush.

Setting Waypoints

In most cases, you'll want to set at least two waypoints. Typically, you might start by setting the first waypoint in the middle of a mountain range close to the objective, and the second waypoint on the objective itself. If there's a fairly open line of sight between your base and the objective, you'll have to take a more circuitous route in order to approach the objective from the safety of cover. If necessary, use all three available waypoints; you can always adjust their positions on the low-scale map to combine the second and third waypoints.

An alternative approach is to set only a single waypoint at a time and to scout the area at each stop along the way. Because calling up the GPS map pauses the simulation, this method doesn't take significantly more time than charting the entire course from the outset.

While it's usually ill-advised to fly in a straight line from your base to the enemy position, you'll also have to keep in mind that both fuel and time are limited. If you don't want to find yourself stranded in the desert with an empty gas tank, or to be reprimanded for excessively long mission times, you'll avoid any unnecessary side trips. Usually, you'll want to complete both your primary and secondary objectives within a total of 30 minutes. However, if a few additional minutes will mean the difference between taking out both objectives and only getting the primary, by all means take the extra time.

After you set tentative waypoints on the high-scale map, press Spacebar to switch to the low-scale map. Here you can

get a better look at specific terrain features, such as the individual mountains that make up a range, and fine-tune the position of your waypoints to precisely plot the course you want to fly.

Once airborne, you can manually fly your chopper toward the first waypoint using the INS pip for guidance, or you can turn on the autopilot (5) and let the helicopter steer itself toward your first destination. Remember that the autopilot won't circumnavigate obstacles unless collision avoidance is on, so be ready to jump in and take over the controls if it becomes necessary to avoid a collision.

In most cases you should keep your altitude fairly low and avoid flying over the tops of mountains that turn up in your path. Flying at between 120 and 140 feet should keep your chopper concealed from most radar until you're within about three klicks of the enemy. At this point the enemy will be within striking distance of your rockets. Flying at a higher altitude is sometimes necessary if you need to take advantage of long-range weapons. However, you should always be ready to lose a lot of altitude in a hurry if you stumble onto an AA battery.

Conversely, if you find yourself in a situation where you're out of long-range weapons and are forced to rely solely on your cannon or machine guns, don't be afraid to get down as close as 50 or 60 feet off the deck. Although this will give you little time to respond to enemy antiaircraft defense systems, there's a good chance that the enemy won't even see you until it's too late for them to respond and you're close enough to quickly blast them with your cannons (1.5 km).

Time Machine

Be certain that the flight of your helicopter is completely stable before accelerating time, and remember to return the simulation to normal speed before attempting any altitude or heading changes. In some ways, flying at six times normal

speed or faster is actually safer than flying at four or even two times normal speed. The reason is that at six times normal speed or greater, the simulation is automatically returned to normal speed whenever an enemy unit appears on the threat display. At four times normal speed, the simulation continues in an accelerated fashion even during an encounter.

Often you'll come across unanticipated pockets of enemy resistance on your way to an objective. These units will try to distract you from your real mission. Therefore, even if you've already plotted an elaborate course to reach your objective, don't hesitate to stop and modify your course as many times as necessary—to avoid having to slug it out with tertiary targets, and to ensure that you reach your real objective with enough ordnance remaining to complete your mission. If possible, save a few rockets and rounds for "targets of opportunity" so you can give them some attention on the way back to your base.

Going Undercover

In general, you should fly low and use the lay of the land to keep your chopper hidden from the enemy for as long as possible. For example, if the enemy is positioned close to a river, you can actually drop your chopper down to below ground level by flying along the river, 50 to 60 feet above the water. This works because the riverbed itself is usually exactly 114 feet below the surrounding terrain. Once you get close to the enemy position, pop up over the riverbank and start blasting away with missiles or, if you're within range, you can take 'em out using your cannons or minigun pods.

A similar tactic can be used against enemy positions that are close to the entrance to a road canyon or rail tunnel. Set your first waypoint at the end of the canyon or tunnel opposite the enemy, and drop the second waypoint right on top of the enemy position. Fly as low as possible through the canyon or tunnel, and come out firing on the other end.

If you've never flown through a rail tunnel before, it requires less precision and flying skill than you might think. Just position your helicopter above the tracks and head straight for the tunnel. The tracks are usually aligned with a major compass direction, so as long as you're directly above the tracks and match the proper compass heading (usually 0, 90, 180, or 270 degrees), you're all set. Any altitude below 185 feet should do the trick, but I like to stay under 100 feet just so I can emerge from the other end at a low altitude.

Another approach is to set up an ambush by waiting at one end of a canyon or tunnel through which an enemy platoon is expected to be traveling. If one of your objectives is to intercept a train, you can even hover over the tracks at one end of a rail tunnel and look directly through the tunnel as you wait for the train to come into view. When it does, you can ripple-fire a few Hellfires right through the tunnel to stop the train in its tracks!

Even when you can't cut through a canyon or tunnel to mask your approach, you should definitely stay low and try to keep covering terrain between you and the enemy throughout as much of the trip as possible. As you approach the enemy position, you may want to lower the collective and reduce your speed slightly, particularly if you're going to be firing rockets. Nothing will get you shot out of the sky faster than charging directly into a heavily fortified enemy position at top speed.

If you're flying a Kiowa, or some other chopper with a mast-mounted sight, try to find a hill as close to the objective as possible so you can pull up to a hover behind it. Turn on the mast view and add collective slowly until you can target enemy units on the other side of the hill, using your mast-mounted sight. Stabilize your altitude and use Hellfire missiles to begin picking off enemy units on the other side without being seen. In this position, you'll even be able to designate targets for other helicopters in your flight. Since in this position you can fire from relative safety, take the time to select the most dangerous targets first.

Returning to Base

Following successful destruction of your assigned objectives, you can call up the GPS map and simply hit [B] to set a waypoint for your base. If you have a FARP somewhere on the map, pressing [B] repeatedly will toggle the waypoint between the FARP and your base. It's often to your advantage to use autopilot on your return to base, particularly if you're based on a helicopter carrier. The autopilot will automatically slow the chopper to a hover in a safe position for landing.

Once the autopilot disengages, you must be careful not to let the wind force you off the mark. If you're attempting a carrier landing, watch your altimeter, and be ready to make adjustments or add collective as necessary to avoid touching down in the water.

Speaking of Carriers . . .

If you ever find yourself stationed on a helicopter carrier in the Persian Gulf, there are a couple of other points related to navigation that you'll want to keep in mind. First, the flight deck of the carrier is exactly 282 feet above the surface of the water. Therefore, when you return to land on the carrier, make sure your altitude is at least 300 to 350 feet.

Second, while the open terrain inland is generally at the same level as the ocean, the level of the land increases dramatically as it approaches the water. In fact, the land can be as much as 150 feet higher right along the edge of the water than it is further inland. Keep this in mind as you head to your land-based objectives or return to your carrier following the mission.

Finding the Enemy

Sometimes the most difficult part of a mission isn't destroying your objectives; it's locating them. Finding your

objective can be a major headache whether you're trying to track down an enemy platoon that's on the move, a downed pilot, a cargo drop-off point, an enemy installation, or a squad of friendlies who need to be extracted. In many cases, the sector listed in your mission orders is only a starting point for your search. Also, as I've mentioned, the maps are seldom right on the money when it comes to pinpointing objectives. Frequently you'll find that after all your careful planning and skillful navigation, you'll arrive at the suspected enemy position only to find the area deserted.

Usually, the quickest way to locate an objective that is conspicuously absent from its reported position is to gain some altitude so you can get a better overview of the area. Begin by using your rudder or tail rotor control to circle around the objective's reported map position.

If your chopper is equipped with a mast-mounted sight, switch to the sight view (F2) and scan the horizon in all directions. As you turn, gently pull back on the cyclic to start gaining altitude. Be ready to launch a rocket or Hellfire missile at the first target that appears. Then drop back down to a safe altitude, call up the GPS map, and plot a course to the enemy's new position.

Moving enemies traveling across open terrain will travel in a straight line until they come to some obstacle that they must circumnavigate. However, if they begin the scenario traveling along a road, they'll follow the road even through canyons or over hills. Again, remember that enemy ground units can only move at about a quarter of your speed.

If you're searching for a secret enemy installation, don't expect to find it out in open terrain. Instead, look for the nearest mountain range. You're likely to find the enemy nestled snugly in among the hills. If you discover a defensive unit or two, you'll know you're on the right track.

Sometimes it will seem as if your objective is simply nowhere to be found. If you've done a thorough search without turning up your objective, don't jeopardize the entire mission by using up all your fuel on the search. Whenever the enemy pulls an incredible vanishing act and

time and fuel are both running out, just turn around and head back to base. In many cases you'll stumble over the missing objective on the return trip.

"Get Those Choppers Back to Base!"

Your CP/G will warn you when your fuel is down to 20 percent, and again shortly before you run out. At the first warning you should definitely begin thinking about heading back to your home base by the shortest possible route. After the second warning, you should call up the GPS map every couple of kilometers to check the percentage of fuel you have remaining. The exact percentage of remaining fuel is displayed under ORDNANCE below the damage schematic to the right of the GPS map. *Don't rely on the fuel gauge* in the cockpit to tell you when you're about to run out of gas.

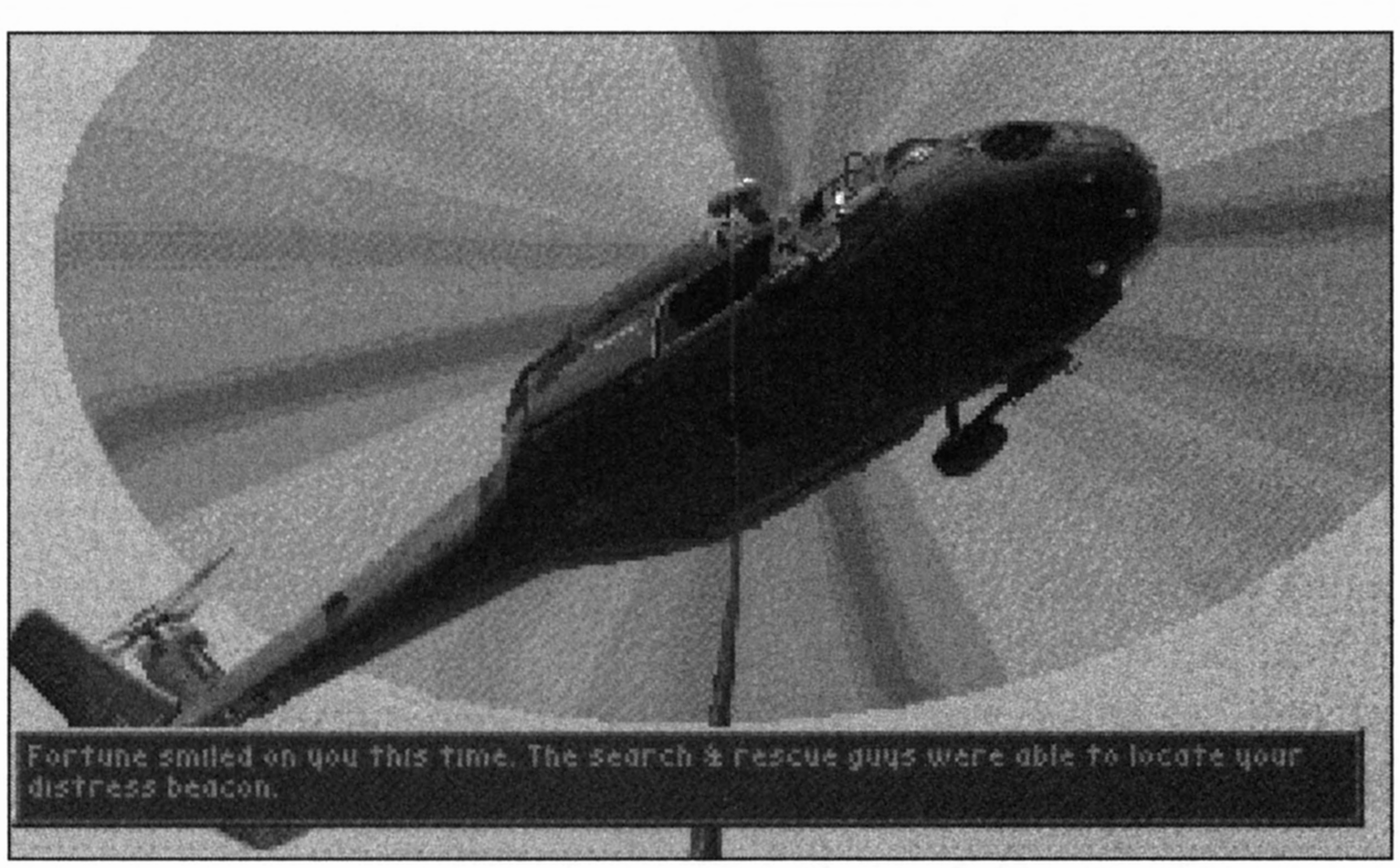


Figure 2.4 Black Hawk to the rescue

Try to get as close to your home base as possible before landing the chopper. Whatever you do, don't burn your last drop of fuel while you're still flying at 120 feet in the air unless you want to practice your autorotation skills. To be safe, when your fuel supply gets down to 2 percent you should find a level piece of land, set your chopper down on the deck, and call it a day.

STRATEGY AND COMBAT TACTICS

Because attack helicopters are much slower than fixed-wing aircraft, it's dangerous to try to apply to helicopters the same strategy, maneuvers, and combat tactics that are successful for jetfighters. For example, while an F-15 pilot may be able to swoop boldly out of the stratosphere at close to Mach 2, launch a couple of smart bombs at an enemy installation, and then deftly turn to engage enemy fighters, the chopper jock must take a much more deliberate, low-key, and methodical approach to such a mission.

The pilot of a combat helicopter, such as a SuperCobra or an Apache, is more likely to sneak up on his objective and then pop up from behind a tree line, or to come cruising around the nearest hill with chain guns blasting, than he is to dive out of the clouds in a blaze of glory. Because NOE flying is essential to the helicopter's survivability, attack helicopters must be thought of more as highly mobile ground forces than as combat aircraft. However, the attack helicopter's unique flight capabilities allow it to assume a dual role that combines the best elements of both air and ground forces.

As was demonstrated during Operation Desert Storm, it's virtually impossible to achieve a strategic objective through air strikes alone. No matter how devastating the air campaign, ground forces are always needed to seize control of territory that has been softened by air strikes. Because of the unique dual role of the combat helicopter, it can play an important part in both the air and ground phases of such an operation.

Four Steps to Success

No matter what type of helicopter you're flying, or what type of mission you're on, during any combat engagement your goal should be to inflict as much damage as possible on the enemy while incurring as little damage as possible to your own chopper. In most situations, this means getting the first shot off and making it count. It also means resisting the

temptation to launch Kamikaze-type attacks that may make scrap metal out of the enemy units, but may also leave you and your chopper at the top of the junk heap. No one needs decorations like the Purple Heart or the posthumously awarded Air Medal for Valor.



Figure 2.5 One medal you don't want to collect

Most missions can be successfully completed if you do four things:

1. **Anticipate** the types of units you are likely to face when you reach the objective.
2. **Evaluate** each threat as it arises.
3. **Deliberate** on the proper course of action.
4. **Eliminate** the enemy in the most efficient manner possible.

Here you could also add **Annihilate, Devastate, Obliterate**. . . .

Anticipate

As discussed above in the section on arming, you should anticipate the types of units you're likely to encounter on a mission and equip your choppers with enough of the right kinds of ordnance to do the job. While there are scoring

penalties for selecting big, expensive choppers such as Longbow Apaches, and bonuses for selecting smaller, lighter aircraft such as Defenders and Comanche Scouts, there are no similar scoring incentives related to armament selection. In other words, you won't receive any more points for using only your cannon to pick off an entire platoon one by one than you will for obliterating them en masse in a hail of ripple-fired Hellfires.

Therefore, you should never shy away from arming your helicopter with the most advanced, most devastating weapons available. However, it's critical that you use all your weapons intelligently and appropriately. Don't simply blast every target you see with whatever weapon happens to be armed when the blip appears on your threat display.

Even before you reach an objective, try to imagine what types of units you're going to find waiting. Whether you're instructed to destroy an airfield, a column of tanks, a supply train, a mobile Scud site, or a truck convoy, the enemy position is probably fortified with SAMs and AA guns. Thus, even though your true objective may be relatively harmless (even the most powerful tanks are defenseless against a helicopter at more than 1.5 km), in most cases there will be defending units that must be dealt with before you go in for the kill.

If you expect to surprise the enemy at close range, either by sneaking up on his position or by ambushing him as he moves into your line of fire, fly low (100 feet or less), have your cannons armed, and be prepared to fire as soon as he's within range. If it seems that such a close-range attack will be impossible given the enemy's position and the quality of the intervening terrain, fly at a higher altitude (120 to 150 feet) and arm the longest-range weapons you have on board *before* you reach the objective.

Evaluate

Point of fact: Not every red blip that shows up on your threat display is necessarily a real threat. Oh, sure, they're

all enemy units and if you fly in the general direction of an enemy you're likely to get shot at. However, while you're on your way to a specific objective, it's very possible to pick up an isolated towed gun on radar that hasn't spotted you, that isn't part of your objective, and that, unless you actually fly toward it, will never become aware of your presence.

At other times, you might pick up on radar an isolated SAM that can easily be dodged by losing some altitude or making a small detour behind the nearest hill. In cases such as these, it's your call as to whether you want to pursue and destroy these targets or continue toward your objective. However, keep in mind that your time, fuel, and ordnance are all limited and one lucky shot to the tail rotor is all it takes to make your chopper unsuitable for further combat. Remember, you'll have to pick off a hell of a lot of isolated units to make up for a failure to achieve your primary or secondary objective.

As you near your true objective, you should reduce your collective, then pull back slightly on the joystick to slow your helicopter to 100 knots or even slightly less. This way, you'll be able to identify and eliminate long-range threats before having to worry about short-range dangers. If you plough into a situation at full speed, you'll quickly find yourself the target of every SAM, AA gun, and MG within a 3-klick radius.

Deliberate

When you do finally reach the objective, don't automatically start launching missiles at the first target you see, particularly if the target is unarmed or equipped with only a small, short-range weapon such as a machine gun. Instead, scan for other, more dangerous targets by pressing Button #2 on your joystick.

Also, don't feel compelled to keep driving forward into the enemy position. If you're taking damage or having trouble assessing the situation, turn away from the enemy,

lose some altitude and maneuver to reach a safe zone. Collect your thoughts, make a plan, and try again. Once you've identified and eliminated long-range threats, pause to plan your next course of action before continuing the attack. Look at your GPS map to see what types of units have been uncovered. Figure out which of them pose the most immediate threat to your safety.

Eliminate

First, look for self-propelled SAM vehicles, especially those with quality IR- or radar-guided missiles such as the SA-6 Gainful, SA-9 Gaskin, SA-11 Gadfly, or SA-13 Gopher. These have the longest range. Also look for BMP-1s and BMP-2s, MT-LB and EE-11 APCs, BTR-60s, -70s, and -80s, and infantry squads. Although none of these units is specifically designed for air defense, all are usually armed with IR-guided missiles and have a range of between 4.5 and 7.0 klicks. Use long-range missiles to eliminate all these types of units first.

As you get closer to the objective, you should switch to rockets and go after any self-propelled AA vehicles, such as ZSUs and 2S6s. Since these units typically have ranges of only 2.0 to 2.5 km, they're ideally dispatched with M-247 rockets from about 2.9 km. Alternatively, because these are all radar-guided weapons, they're also easily eliminated using Sidearm anti-radiation missiles.

One excellent feature of Sidearms is that you don't even have to lock in a target before launching them. If you simply fire a Sidearm in the general direction of an enemy radar source, the missile will locate, lock in, and destroy the enemy unit without any additional help from you.

Ultimately, you'll want to be left with an objective that's virtually defenseless against your rockets and cannon fire. From that point on, the mission becomes just another mop-up job. In most cases, you can simply switch to cannon and start blasting away as you close in.

By using your long-range missiles against SAM-

equipped units, your rockets and Sidearms against medium-range AA guns, and your cannon against unarmed or machine-gun-equipped units, you not only eliminate the most serious dangers first, but also conserve ordnance, and thus greatly improve your scores. Instead of wasting all your Hellfire and TOW-2 missiles on relatively helpless T-72s and then having to split in a hurry because you don't want to go head-to-head against the supporting SA-13s and EE-11s using only your 30mm chain gun, you can methodically blow the SAM-equipped units off the map with your Hellfires before calmly ripping into the T-72s with your chain gun.

Tactics

Of course even the most brilliant, carefully planned strategy is doomed to failure if it's poorly executed. Therefore, you should practice specific combat tactics until they can be performed quickly and effortlessly. Some of the most important tactics to master include ripple-firing of Hellfire missiles, using the mast-mounted sight on the Kiowa Warrior, Longbow Apache, and Defender helicopters, aiming and firing Hydra 70 rockets, using various countermeasures, air-to-air combat with enemy helicopters and fixed-wing aircraft, and emergency maneuvers.

Ripple-Fire

As discussed earlier, ripple-firing is a technique by which several closely grouped targets are destroyed in rapid succession using AGM-114A Hellfire missiles. Because the conventional Hellfire-A is not a fire-and-forget weapon and must be guided all the way to its target by keeping the target locked on your HUD, you're never free to turn and flee once a Hellfire is launched. However, there's no rule that says you have to wait for the first Hellfire launched to hit its target before launching the second, third, fourth, etc., as long as the Hellfires are properly spaced.

As the first target is destroyed, your TADS will automatically find and lock onto a second target, changing in mid-flight the course of any Hellfires already on their way to the target area. Likewise, once the second Hellfire finds a target, the third will be rerouted to the next target, and so forth. The trick is to make sure there are enough targets to go around in a small area, and pausing just long enough between launches to insure that each Hellfire has enough time to correct its course after the previous Hellfire hits.

Timing will vary slightly according to the speed of your computer. With a 12-MHz machine, you should wait about two seconds after a Hellfire actually blasts away from your chopper (don't count the one or two seconds of pre-launch "hissing") before launching the next one. On faster machines you may have to wait only half as long. Experiment during training missions to determine the quickest possible effective launch intervals for your computer.

Mast-Mounted Sight

So what if an F-18 can fly at nearly twice the speed of sound? In your Kiowa Warrior, Longbow Apache Gunship, or Defender Scout helicopter, you can come to a dead stop less than 60 feet above the ground, then slowly climb straight up to peek over a nearby hilltop with your mast-mounted sight.

Here, the trick is to fly low and to get as close to the hillside as possible before turning parallel to the hill and pulling back on the cyclic to slow the helicopter. Immediately switch on the auto-hover ([0]). Even though the auto-hover won't take effect until you've slowed your chopper down to less than 10 knots, you can turn it on at any speed and it will automatically kick in when your speed is low enough.

Once auto-hover takes effect, activate your mast-mounted sight and scan toward the hill as you increase your collective. Remember, while the mast-mounted sight is activated, your collective and tail rotor controls work as they normally do, but the cyclic or joystick is now used to rotate

the view. Rotating the chopper by using the tail rotor control won't change the view, since the mast-mounted sight remains fixed on whatever it's pointed at until you change it using the joystick.

Once you spot a target, stop your ascent by decreasing the collective. If you stop quickly, only the top of the mast will be exposed and your helicopter will still be safely hidden from your enemy's view. If the target is within range of available weapons, lock it in and fire.

Sometimes you may have to use your tail rotor control to adjust your helicopter's heading to match the bearing of the target (remember, the mast-mounted sight rotates independently of the chopper). Determine which weapon system should be used to destroy the target. If it's a unit that can be destroyed using one or another Hydra 70 rocket, by all means use this weapon. This is the ideal situation for launching rockets, since you don't have to worry about gaining too much altitude as you pull back to take aim.

In many cases, using your mast-mounted sight will allow you to quite safely pick off confused enemy units one by one as they frantically search in vain for the source of their destruction. If you can maneuver yourself into such a cozy position, take the opportunity to switch to Missile View (F9) to follow your missile or rocket right into the helpless target, or Reverse Tactical View (F8) to watch the destruction from your enemy's point of view. Used correctly, the mast-mounted sight can make a Kiowa Warrior every bit as deadly as the most heavily armed Apache and, because the mast-mounted sight allows you to designate targets for the other helicopters in your section, it can enhance the performance of the entire flight.

Rocket Man

Unfortunately, not every helicopter comes with a mast-mounted sight, and there's not always a conveniently located hill nearby every time you want to pull over and launch a few M-247s at the enemy position. In many cases, you'll

simply have to pull up, take aim, and fire your rockets while trying to maintain control of your helicopter. Although this takes considerably longer than simply squeezing the trigger to launch a Hellfire at a locked target, it's good to know that once the rocket blasts away from its pod, you're free to pursue other activities (like saving your butt!).

The biggest problem with launching rockets "on the fly" is the altitude you gain when you pull back on the cyclic to take aim. If you can reduce your collective slightly before pulling up, it will slow your ascent and help to stabilize your chopper. Also, try to use your tail rotor control to align your crosshairs directly under the target designation box before you begin pulling up with the cyclic. This will mean fewer heading adjustments and a quicker lock while aiming. If your heading still isn't quite right for a lock, adjust it further using your tail rotor control.

I don't generally mess around with the salvo settings very often. The default setting of 2X is usually appropriate for most target types, although some targets can definitely be eliminated using just a single rocket (1X). Therefore, if you've got a lot of targets left and are running low on rockets, don't hesitate to switch to the single-rocket setting. On the other hand, if you've got plenty of rockets to spare and you want to make sure that one launch is going to do the trick, crank the salvo setting up to 4X. Just be sure to get a good lock on the target before pulling the trigger.

Keep in mind that firing rockets (or any other weapon) can alter the flight of your helicopter in two ways. First, the kick of the weapon itself can push the front of the chopper up slightly, slowing you down or causing you to start gaining altitude. Therefore, after every launch you should be prepared to adjust the cyclic to restore level flight. Second, the decrease in the weight of your load as ordnance is expended can result in faster airspeed or, again, an increase in altitude. Make adjustments as necessary to maintain stable flight.

Finally, getting hit by enemy fire can also affect your

altitude, although, contrary to what you might expect, you're more likely to gain altitude than to lose altitude as a result of taking a hit. During combat, just be sure to keep an eye on the altimeter, and maintain careful control of your chopper throughout the battle.

Countermeasures

Countermeasures are those little things you have to remember to do to avoid making a lot of unscheduled landings in the enemy's front yard. They include the use of radar and IR jammers, the dispensing of flares and chaff, and, perhaps most important, evasive flying.

Your helicopter is equipped with red warning indicators that light up when you're being tracked by radar or infrared weapon guidance systems. The locations of these indicators vary from helicopter to helicopter, so it's advisable to locate them before you take off.

When one of these indicators lights, it's accompanied by a beeping sound. When you hear it, check to see whether it's a radar or an IR warning, and switch on the appropriate jammer ([N] for radar and [>] for IR). This will cause a green indicator to light beside the appropriate warning indicator. If a missile is launched toward you, the CP/G will announce INCOMING and the direction from which it's coming. Immediately change your heading and push forward on the cyclic to lose some altitude.

When the enemy's tracking system has been successfully jammed, the warning light will go out. However, any missile already en route toward you will continue in a straight line, so it's imperative that you get out of its way before it arrives. Your IR jammer always has a 50-50 chance of working, but your radar jammer becomes less effective the longer it is used. This is because the enemy radar guidance system will simply change frequencies until it burns through the jammer. Your best bet is to try to destroy radar-guided systems as quickly as possible.

If you're unable to successfully jam the missile's guidance system, try to decoy radar-guided missiles by dispensing chaff ([M]), or IR-guided missiles by launching a flare or two. Decoys are always more effective if you wait until after the incoming missile has closed to at least half the distance between you and your enemy before launching. If you use decoys too early, the chaff will dissipate (or the flares will drift away) before the missiles get close enough to be affected. However, if you wait too long to use these decoys, it will be too late to throw the missile off your track.

If you manage to destroy or evade a target that has been tracking you using an IR guidance system, your IR warning light will go out as your IR jammer shuts itself off. However, your radar jammer must be shut off manually. If you forget and leave it on, it could draw the attention of other units that would otherwise have been unaware of your presence.

While it's extremely difficult to outmaneuver missiles and impossible to dodge flak in a slow-moving attack helicopter, it is possible to defeat enemy guidance systems through evasive flying. Again, this involves changing your heading and losing altitude as quickly as possible. The fastest way to do this is by jamming the cyclic to one side while using your tail rotor to spin the chopper in the same direction. Such violent banking should cause you to lose altitude pretty quickly, but if you're not dropping fast enough, don't be afraid to reduce the collective as well. Remember, ground effect will help to slow you down if you drop down below 50 feet.

If there's some type of covering terrain nearby, try to duck behind it. Once you reach a safe area, you can stop to evaluate your position and, if necessary, construct a new plan of attack.

You're Not Alone Up There

Although most of the foes you face will be shooting at you from down on the deck, occasionally you'll come up against a MiG pilot or enemy chopper jock who seems to think the

sky isn't big enough for both of you. He's right. It's your job to make sure you're the one who's still flying when the dust settles.

Enemy aircraft appear as blue blips on the threat display. It's unlikely, though not impossible, that you'll see more than one blue blip on the threat display at a time. For instance, you never have to worry about running into an entire squadron of MiGs on patrol. However, you're bound to run across an occasional MiG-23 Flogger, MiG-29 Fulcrum, or Su-25K Frogfoot, not to mention the usual Mi-24 Hinds, Mi-8 Hips, Mi-28 Havocs, Ka-34 Hokums, and SA-342 Gazelles.

The good news is that the opposing air force seems to be made up of poorly trained pilots who are very indecisive when it comes to air-to-air engagements. Even the best of them don't seem to have that killer instinct necessary to shoot first and ask questions later. Therefore, provided you're packing the proper ordnance, any air threat can usually be eliminated without much difficulty.

Fighter jets are best destroyed with Sidewinders. As soon as you identify a blue blip as an enemy plane, arm your Sidewinders, turn toward the plane, lock it in, and fire. If you're out of Sidewinders you could try Stingers, but it will probably take two or three of these to bring down a jet. If all else fails, head for cover. If the jet buzzes your position, be ready to return fire with your cannons.

As for enemy helicopters, nothing fancy is required. Simply send a Stinger or two in their direction or, if you feel more ambitious, go after them with your chain gun. Just try to stay behind them and keep the upper hand. Remember, both types of Hellfires, M-255 rockets, and even Helstreak missiles can be used against helicopters in a pinch.

Whatever you do, don't panic if you see a MiG and you don't have any missiles. Once, on the way back from a less-than-successful mission, I was buzzed by an enemy MiG several times. I had no Sidewinders and no Stingers, and my chopper was severely damaged. Attempts to spray the MiG with my chain gun proved futile. At one point an enemy

helicopter even joined the MiG in a sort of taunting dance around my helicopter. Terrified and certain of my impending fate, I stayed my course.

I've never figured out exactly why, but for some reason, although the MiG kept nosing around my chopper, it never fired a shot. In fact, I was practically escorted all the way to my base by the MiG. I landed and decided to call it a day.

One final note on dealing with air threats. Enemy aircraft behave somewhat differently depending on the version of *Gunship* you're flying. Until the Mission Builder upgrade, enemy helicopters and fighters weren't very aggressive. With Version .07, however, they've been tweaked to respond faster and to put up more of a fight. Don't say I didn't warn you!

Uh-Oh!

Despite all your careful strategic planning and skill as a chopper jock, sooner or later the inevitable is going to happen. You'll get a little careless or overzealous, and bite off more than you can chew. Maybe you'll take a SAM to the tail rotor and find it difficult or impossible to maintain a heading. Perhaps you'll lose power to your engine(s) and be forced to ride your chopper into the sand. Remember, until you hear those snare drums introducing *Taps*, there's always hope.

Take, for instance, the first scenario—a damaging hit to the tail rotor. Although this will require you to make constant adjustments to your heading using your tail rotor control, a damaged tail rotor isn't the end of the world. Nor does it necessarily mean that you should abandon your objectives and head for home. If you've got plenty of ordnance remaining and your other systems are all go, carry on, soldier!

A destroyed anti-torque rotor (red light on the systems status display), on the other hand, is a lot more serious. Lose this baby and you'll find yourself circling over the battlefield like a one-armed man in a rowboat. However, your tail rotor

control will still let you exert a small amount of control over the helicopter. Therefore, even if you get your tail rotor blown off, it's still possible to make it back to base!

First, go to the GPS map and set a waypoint at your base. Return to the cockpit view and, as your heading approaches the INS pip, use the tail rotor control to try to maintain that general direction for as long as possible. As you start to drift past the appropriate heading, quickly apply the opposite tail rotor control to spin around as quickly as possible until you're facing the correct general heading once again. Keep repeating this procedure and eventually this spiral path will bring you home. Remember, even if you don't have enough fuel to make it all the way to your base, the closer you are when you finally land, the better your chance of being rescued by friendlies.

Autorotation

Another extraordinary maneuver that may save your life in an emergency is autorotation. You've read about it—maybe even tried it once or twice. However, like most complicated maneuvers, autorotation gets easier with practice and any time you want to brush up, just volunteer for a training mission and give it a try.

The basic procedure is described in your instruction manual, but I'll reiterate it here and add a couple of points. When you lose power to your engine(s), immediately disengage your rotor ([9]). This will automatically bottom out the collective. Dive forward slightly and try to increase your forward airspeed. Listen for the beating of your free-spinning main rotor to increase in frequency. The faster your rotor spins, the more lift is generated to slow your descent.

If possible, head away from the enemy position and toward your base. Remember, the closer you are to your base when you land, the less chance there is that you'll be picked up by the enemy. If you're still loaded up with ordnance when you lose power, jettison your weapons

([Shift]-[Spacebar]) before landing. Your chance of survival is probably a lot better if you don't hit the deck with hundreds of pounds of explosives still strapped onto your chopper.

Just before impact, pull back hard on the cyclic with your right hand while quickly tapping Collective Up Fast with your left (keep your left thumb down on the right [Shift] while beating on [=] with your index finger). If your timing is close to perfect, you should survive with just a few cuts and scrapes. If not, you can always recover the previous Duty Roster.

Know When to Quit

Sometimes the most useful tactic to employ is a well-timed advance to the rear—particularly if you've already achieved your objective. It's very easy to get carried away in an attempt to make black *X*'s out of every enemy unit on the map. However, more often than not, this leads quickly to your adding the final black *X* with a not-so-graceful swan dive into the dirt. If you've achieved your objectives and your chopper has suffered considerable damage, don't play Rambo and try to use every last round before calling it a day. There are plenty of other missions to be flown.

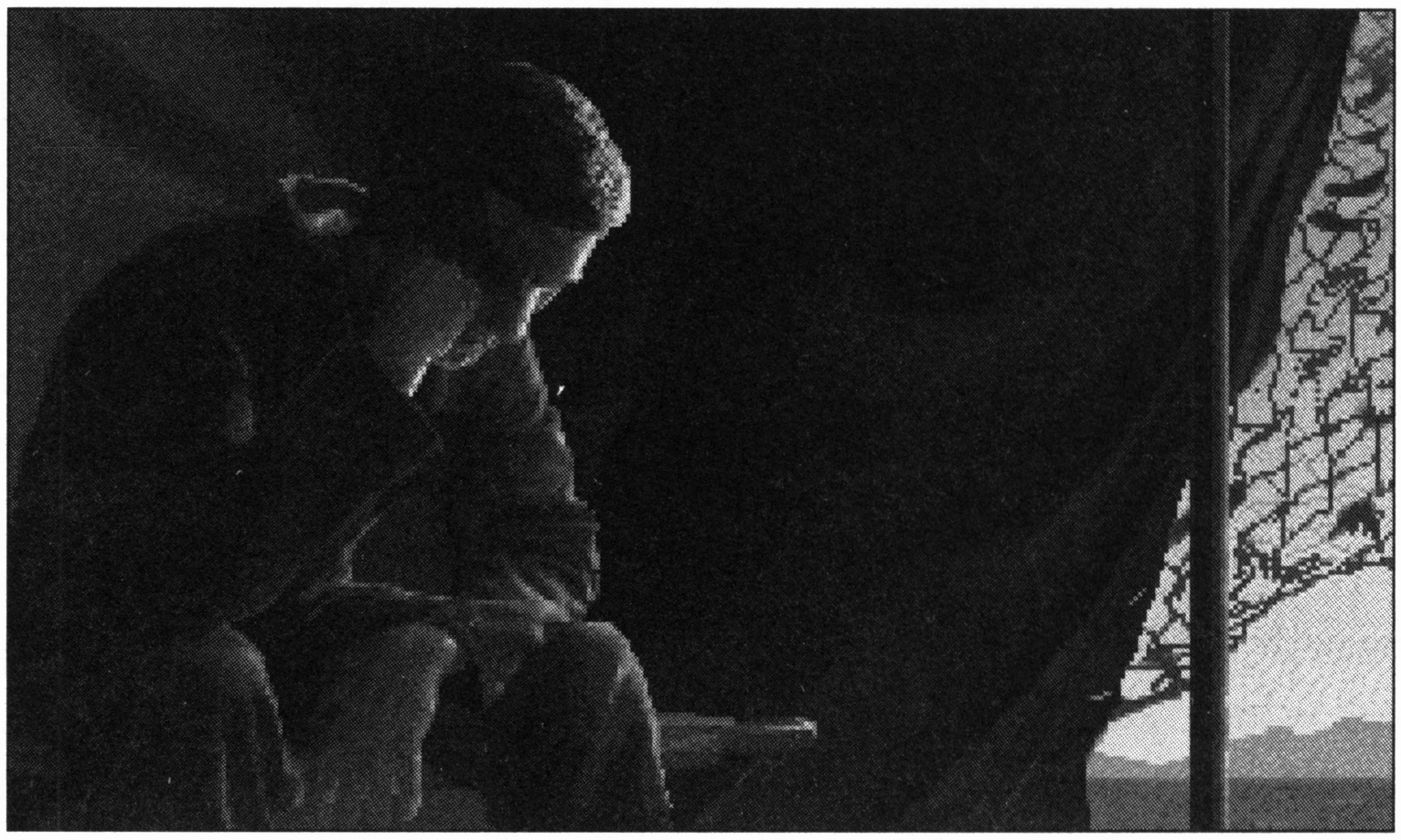


Figure 2.6 Tomorrow's another day

TRAINING FLIGHT

By now you should know the basics of helicopter flight; how to select ordnance for a specific mission based on your mission orders, S-2 report, and mission map; how to find the enemy; what to do to make sure your day goes a lot better than his; and what to do when it doesn't. Now it's time to get your name up on the Duty Roster, select a Theater of Duty on the World Map, and head over to the S-2's tent for your mission orders.

Like every *Gunship 2000* pilot, you'll begin your career as a lowly WOC, or Warrant Officer Candidate. As such, you'll be eligible to fly either a single-helicopter mission or a training mission, in the Persian Gulf or Central Europe. One advantage to trying a training mission first is that, upon successful completion, you'll be awarded the National Defense Service Medal, receive your Army Aviator Wings, and be promoted to Warrant Officer, W-1. From that point on, your immediate goal should be to work your way up to the rank of 2nd Lieutenant or higher. Then you'll be ready to command multi-helicopter flights.

The training mission pits you against simulated enemies in an indestructible chopper. No matter how many times you're hit by enemy missiles or gunfire, you get to keep flying. This provides a great opportunity to practice flying in Realistic mode, to experiment with different strategies, and to perfect the various combat tactics you've learned. Remember that training missions are available at any time during your career if you ever want to brush up on specific tactics.

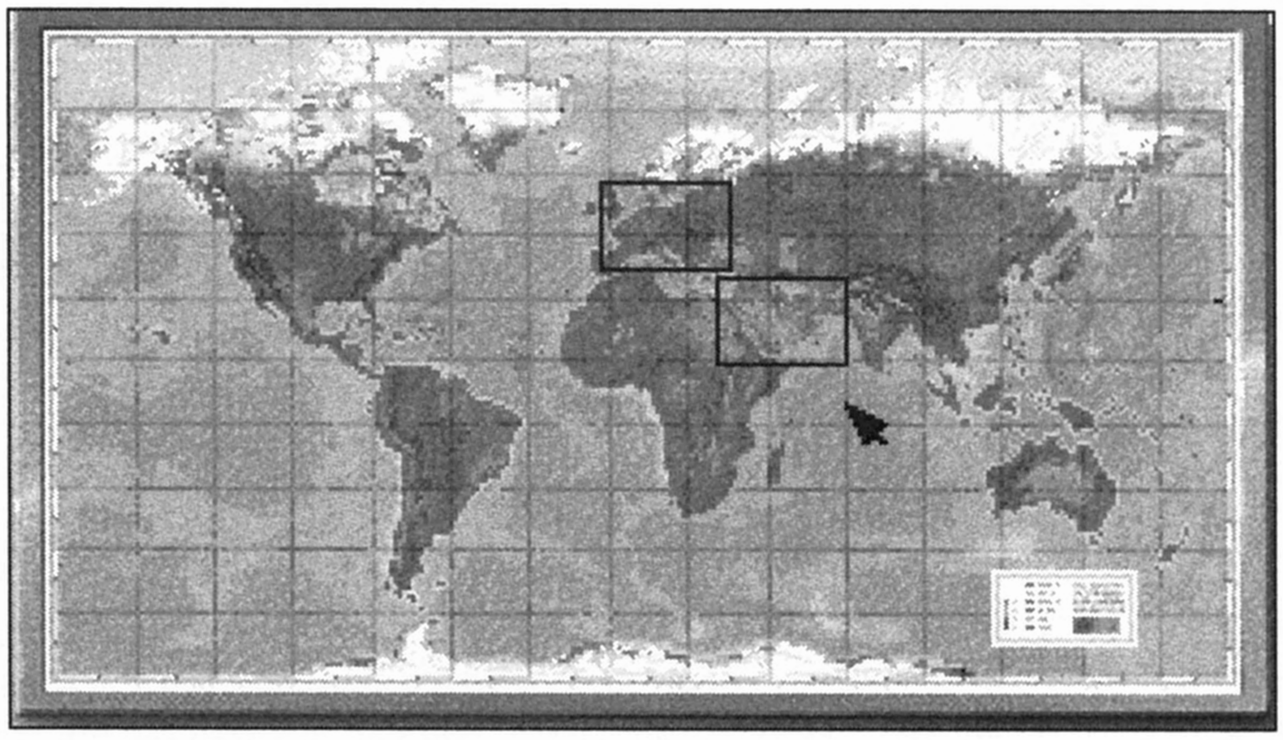


Figure 2.7 *Gunship 2000*'s world map

Persian Gulf

Select the Persian Gulf as your Theater of Duty and head over to

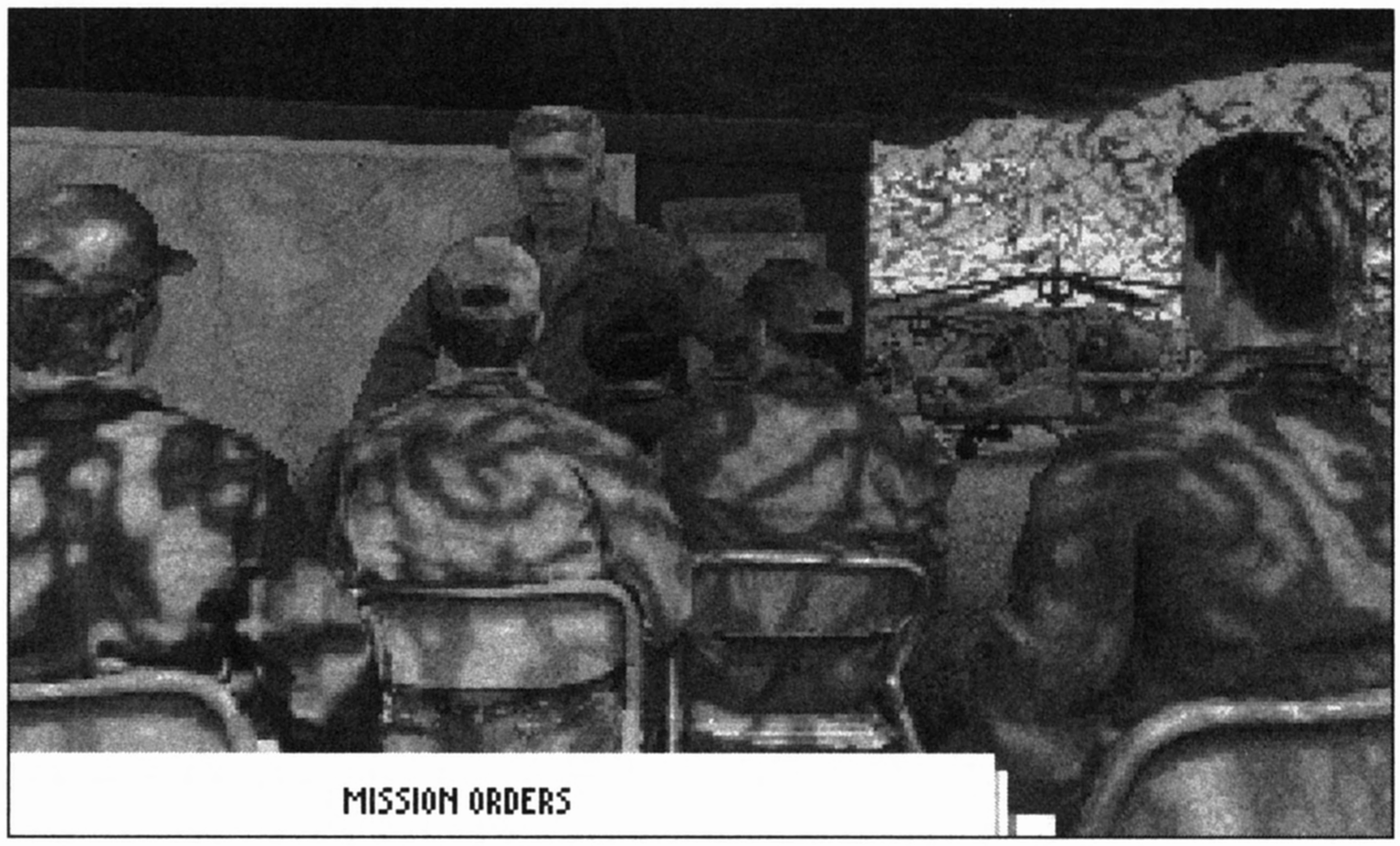


Figure 2.8 Listen up!

the S-2's tent. There you'll receive your mission orders and an S-2 report similar to those shown below. The time of your mission and the call sign will probably be different, but your missions and the location of your base, FARP, and objectives will be identical.

On your S-2 report, wind speed and direction, visibility, and temperature will vary from mission to mission. While your primary mission will be to engage and destroy a BTR-60 platoon and your secondary will be to do the same to a mobile Scud site, the supporting units described in the S-2 report and the level of enemy air activity will also be different each time.

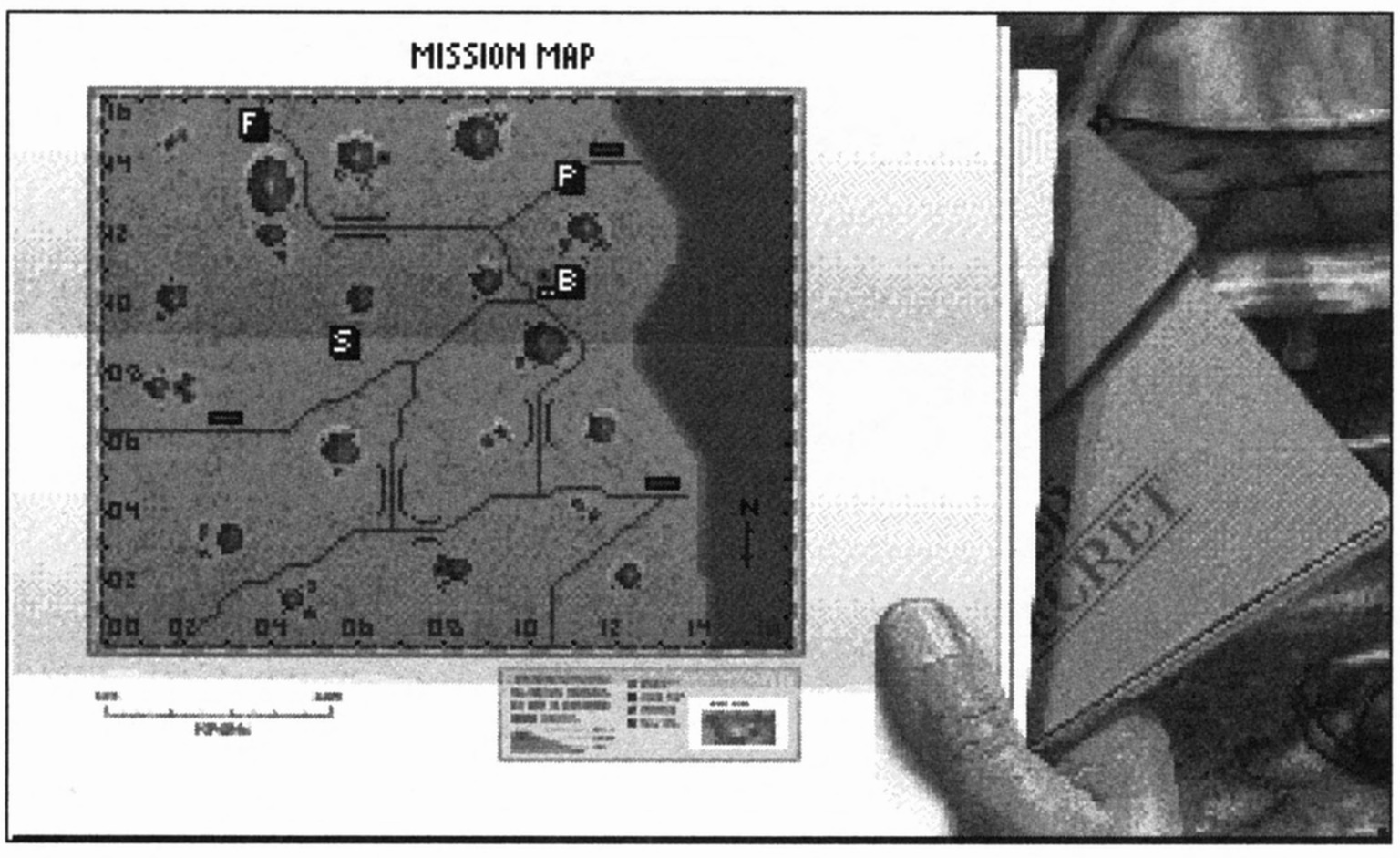


Figure 2.9 Mission map for training in the Gulf

MISSION ORDERS

OPS NUMBER: Training

TO: WOC Guerra

FROM: TF Commander

TIME: 0900 Hours

CALL SIGN: Whiskey

PRIMARY MISSION: Proceed to 11/14 and Engage & Destroy BTR-60 Platoon.

SECONDARY MISSION: Proceed to 06/09 and Engage & Destroy Mobile Scud Site.

BASE: 11/11

FARP: 04/15

S-2 REPORT

This is a day mission. The wind is from 151 degrees SSE at 27 knots. Visibility is excellent. The temperature is 96° F.

Enemy forces are expected to be on full alert throughout the area. T-55, BTR-60, ZSU-23(4), and EE-11 units have been sighted.

Enemy air activity is expected to be light. Mi-8 Hip units have been reported.

After reviewing the mission orders, go to the armorer's tent, where there will usually be a brand-new AH-64A Apache gunship or AH-1W SuperCobra waiting for you on the flight line. If you get the Apache, it will be all gassed up and pre-armed with eight AGM-114A Hellfires

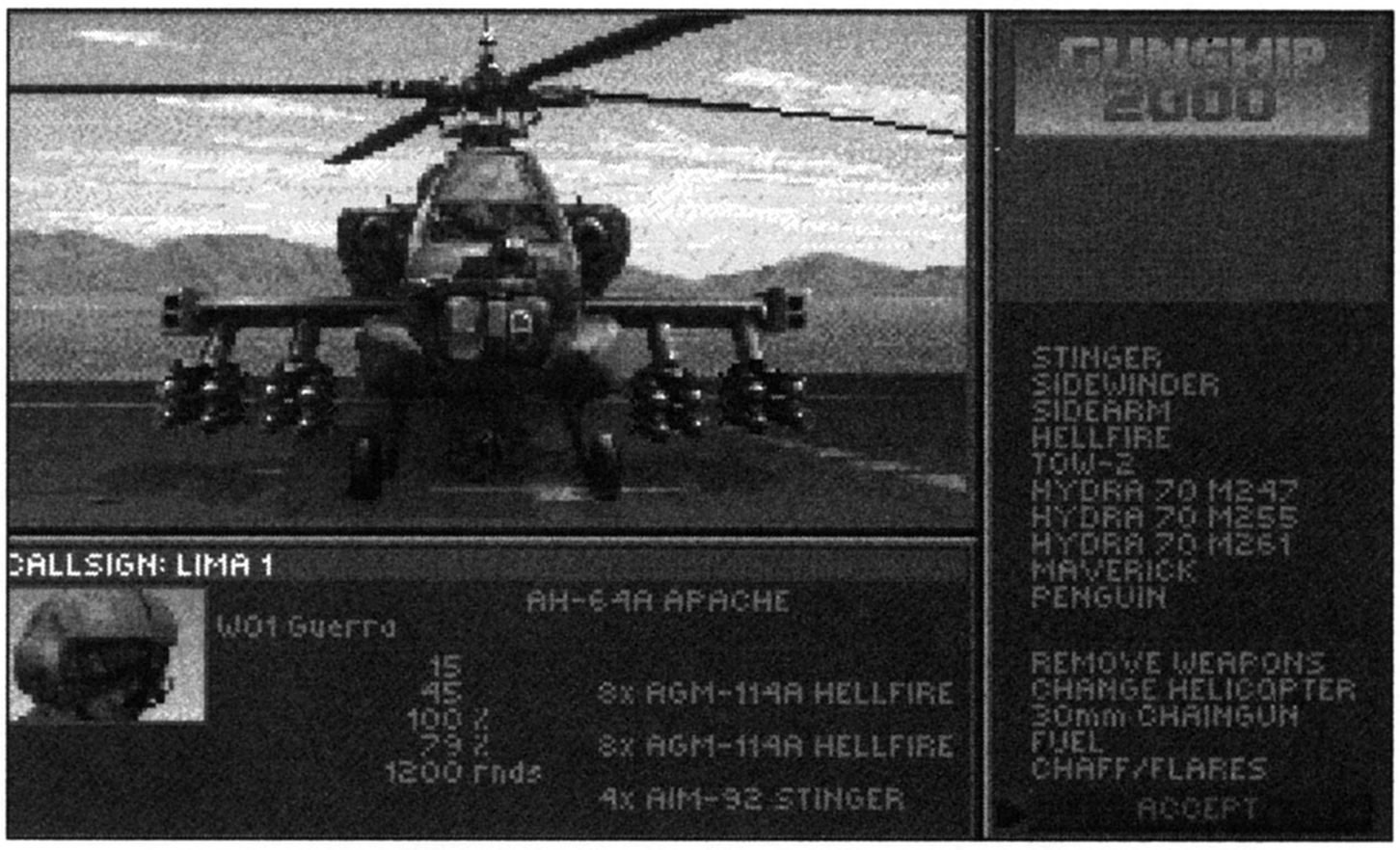


Figure 2.10 Apache all gassed up and ready to go

on the inboard stores, and 14 M-261 Hydra 70 rockets on the outboard stores. The wingtips will be empty. If there's a SuperCobra or some other chopper waiting, trade it in for an Apache and arm it as described below. Later you can try flying the training mission with other types of helicopters and weapon systems.

For this mission, trade in your M-261s for another eight Hellfires. If the level of enemy air activity is extremely high, you may want to add four Stinger missiles to your wingtips. Otherwise, you may find a couple of Sidearm missiles more useful. Finally, before accepting the configuration, you should adjust your flare-to-chaff ratio by increasing the number of flares to 45, which will automatically reduce the number of on-board chaff dispensers to 15. Depending on weather conditions, your load at this point should be somewhere around 84 percent.

Once you're satisfied with the configuration, climb into your chopper and set all the cockpit switches for maximum difficulty. Since this is only a training mission, you don't have to worry about getting shot down, so use the opportunity to learn how hot things can really get out there over the desert.

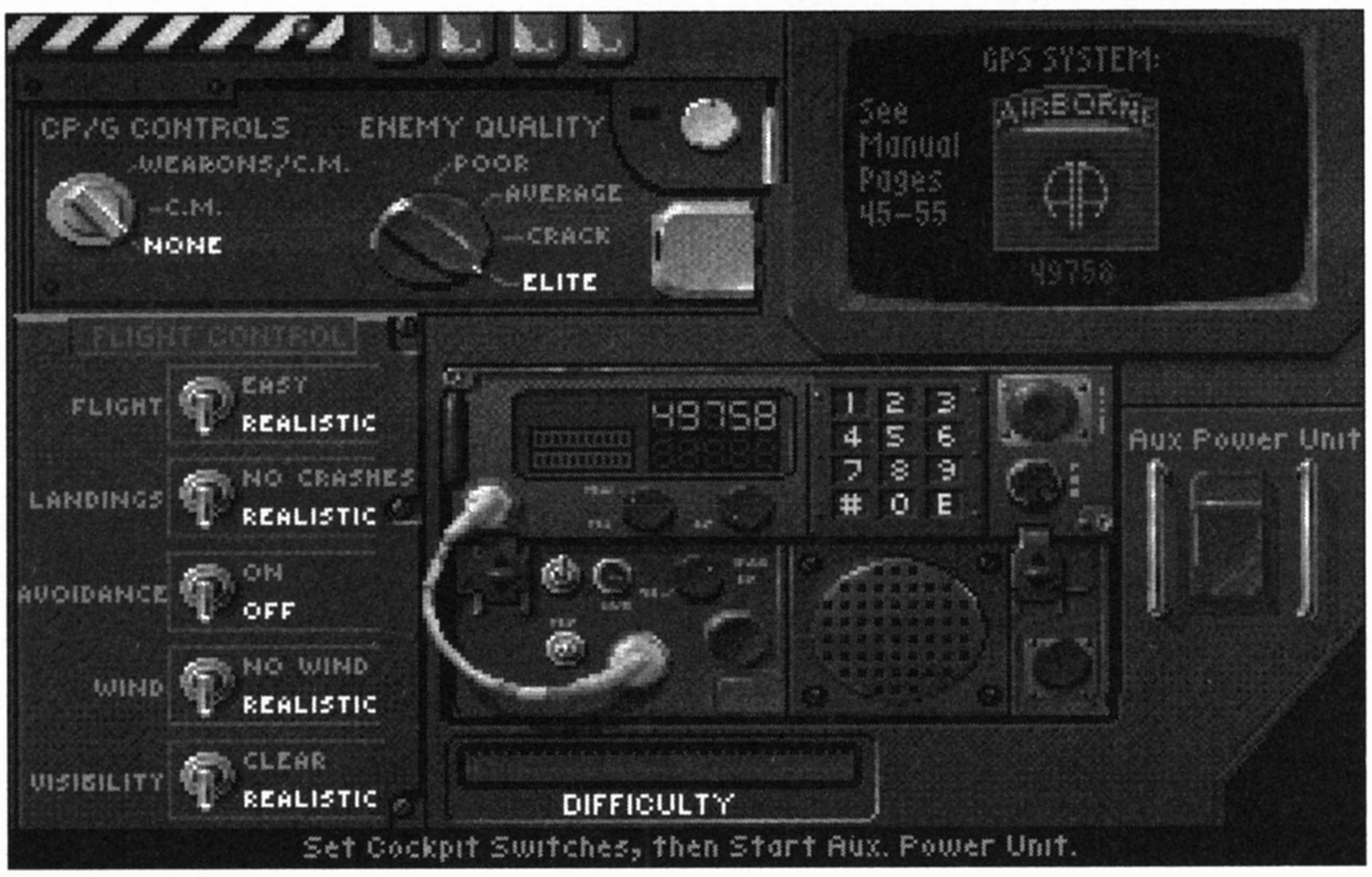


Figure 2.11 Cockpit difficulty switches

The earlier you learn to fire your own weapons and handle all your own countermeasures, the better. Therefore, you should set the CP/G control to NONE. He'll have plenty to do simply announcing targets and warning you of incoming missiles and gunfire. Set the enemy quality to ELITE. Flight, landings, wind, and visibility should be realistic, and avoidance should be off. Since, ultimately, your goal is to fly

under these conditions to obtain the highest possible scores, you might as well get used to them right from the start.

Next, enter the code for the GPS system. Flip up the cover on the APU and switch on the power. You'll hear the whine of your Apache's turbines as the engines start, and before long you'll see the view from the cockpit. Immediately press F10 to bring up the GPS map. Set three waypoints on the large-scale map between your base and the primary. The exact location of the waypoints isn't crucial at this point, because you'll have to adjust their position on the low-scale map anyway.

Switch to the low-scale map (Spacebar). Notice the small hill just to the west of the primary objective and another, larger hill with a road canyon cutting through it just to the southwest. Move the first waypoint to the west side of the larger hill, right at the entrance to the road canyon. The second waypoint should be repositioned at the north side of the smaller hill; the third waypoint can be placed directly on the primary objective. Using this course, you'll attempt to maneuver around to a position just northwest of the primary and attack at very close range, using your 30mm chain gun.

Return to the cockpit view, engage your rotor, and press Collective Up

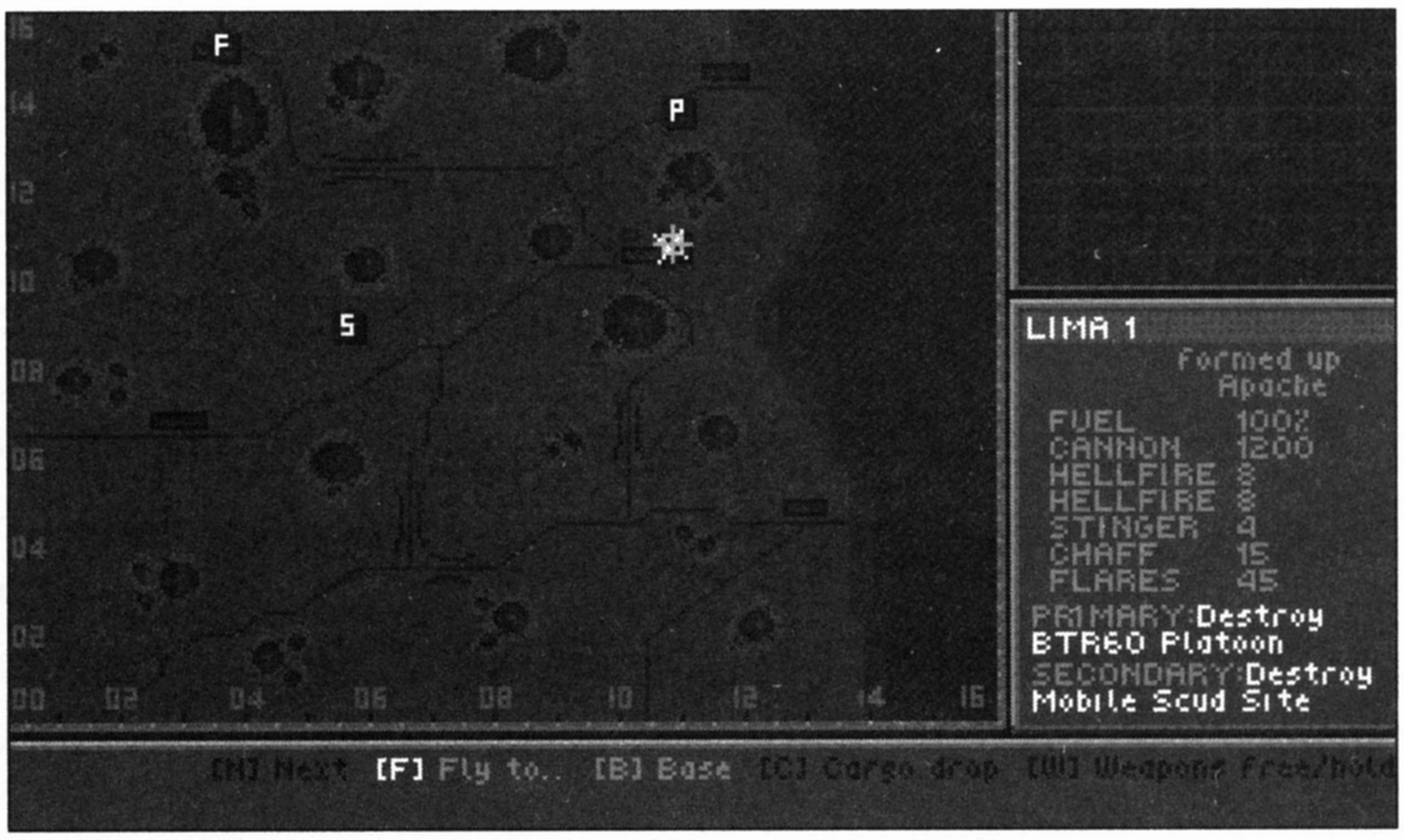


Figure 2.12 GPS map (above) and low scale map (below)



Figure 2.13 Taking off

Fast six times. As the chopper begins to climb, press forward on the cyclic to gain forward speed. As your airspeed increases, translational lift will continue to try to push your chopper upward, but you should be able to stabilize your altitude shortly after your airspeed passes 100 knots. Use the cyclic to adjust your altitude to about 120 feet.

Once your airspeed and altitude are stable, use your tail rotor control to adjust your heading to match the INS pip. This will probably mean assuming a heading of about 345 degrees. Check the digital INS heading readout on your control panel for the exact heading. Press Spacebar once to arm the Hellfires on your inboard stores. Now accelerate time to six times normal, and continue on your present course.

Around the time the mission clock reads 1:30, there will be a small hill in front of your chopper that you should circumnavigate. Return to normal simulation speed and use your tail rotor control to steer around to the west of the hill before realigning your heading toward the first waypoint. In general, you should always try to fly around a hill rather than going over the top, since the altitude required to get over most hills is likely to expose you to enemy antiaircraft

fire. Once you've regained the proper heading, accelerate time once again, and be prepared to launch a Hellfire if an enemy towed gun or BMP-1 appears on the horizon.

As you make your way to the first waypoint, use Hellfire missiles to eliminate any enemy units that stand between you and your objective. If you maintain a fairly low altitude, you shouldn't encounter too many defenders. Should your radar or IR warning indicator start blinking, switch on the appropriate jammer, change your course and altitude, and watch the threat display to determine the best time to dispense flares and chaff. If you do exchange a few missiles with enemy units on the way to the first waypoint, just make sure that you try to resume an altitude of about 120 feet before continuing on to the second waypoint.

When you reach the first waypoint, press [6] to select the second waypoint and readjust your heading. You should be headed northeast, and the small hill to the west of the primary should be just ahead. If necessary, access the GPS map to check your position. Arm your 30mm chain gun and get ready to blast away at the BTRs as you sneak around the north side of the hill.

When you spot the primary—three BTR-60 units—they'll be just about within range of your chain gun. Wait until the gun is within constraints and pump off a couple of bursts. Watch as the first BTR erupts with smoke, and rapidly squeeze off a couple more bursts. When the third BTR goes up in flames, check the area for any remaining defenders. Once you've cleared the area of all bad guys, return to the three burned-out BTR-60s and punch up the GPS map.

If you want to head back to base now and call it a day, feel free. With your primary mission successfully completed, you're assured of a quick promotion to Warrant Officer, your own set of Army Aviator Wings, and a National Defense Service Medal to pin on your chest. However, if you've got some ordnance left and hate the thought of leaving that mobile Scud site standing at the end of the day, then stick with me. It's still early and the fun's just starting.

Scud-Busting 101

After completing the primary mission, you should still have plenty of fuel and, unless you got really trigger-happy on the way to the primary, at least eight Hellfires remaining on your outboard stores. Therefore, a pit stop at the FARP won't be necessary this time around. Be warned, however, that if you do decide to make a side trip to the FARP, it's unlikely that you'll be able to complete the mission in less than a half-hour.

Locate the secondary objective on the GPS map. From the original location of the primary objective (now just a black splotch on the map), the secondary is to the southwest, at a heading of around 226 degrees. Instead of flying directly to the secondary, however, you should set one waypoint on the mountain range that's just to the north of the secondary, and a second waypoint on the objective itself.

Switch to the low-scale map and adjust the first waypoint to just behind the southernmost hill in the range, and make sure the second waypoint is right on the secondary. This will give you a heading of approximately 231 degrees to the first waypoint. Depending on the level of enemy resistance you faced on the way to the primary objective (and, believe me, this can vary greatly), you'll probably be about seven minutes into the mission at this point.

Since the secondary isn't as close to any covering terrain as the primary was, it won't easily lend itself to a similar type of close-range attack. Therefore, you should assume an altitude of between 140 and 150 feet, and be prepared to launch Hellfires at relatively long range.

Fly around any hills that you find, but be prepared to face possible defenders around every corner. You never know where you'll encounter pockets of enemy resistance. Check the mission map occasionally to gauge your progress. It's a long way between objectives, so you may want to accelerate time to speed up the journey. Just be

sure to return to normal time whenever there's a hill in your path.

When you reach the first waypoint, fly around to the west of the hill, and head for the second and final waypoint. Remember to slow down to just under 100 knots before continuing on to the secondary. Look for missile-toting defensive units first, such as SA-9s, Zoos, BMPs, and BTR-60s. Whatever you do, avoid going after the mobile Scud launchers first. Remember, they can't hurt you, but just about every other type of unit in the area can. After all defensive units have been eliminated, you can easily destroy the Scud launchers with a few blasts from your 30mm chain gun.

Despite your best efforts, you'll probably take a lot of hits on this one. It's easy to get careless when you know the bullets will just bounce off. Nevertheless, you should try to dodge as many SAMs and flak bursts as possible by using your jammers, chaff, flares, and evasive flying. This *is* a training mission, after all, and now's the time to develop your skills as pilot, navigator, and gunner.

By the time you've completed the secondary mission and destroyed all enemy units in the area, you're likely to be running low on both missiles and fuel. However, if you've still got some ammo and would rather look for a little more target practice than head back to your base, you may be in luck.

Usually, the S-2 report for training missions in the Persian Gulf lists T-55s as one of the four sighted target types. If you have yet to come across any T-55s, you may want to do a little hunting before heading back to base.

Although the T-55s are likely to be in a different location each time you opt for training in the Persian Gulf, you can start the hunt by heading for your FARP. (You're going to need more fuel soon anyway.) To increase your chances of finding the tanks, increase your altitude to about 235 feet and do a 360 every four or five klicks to scan for the enemy units. Search carefully around the mountainous area to the

south of the FARP. Even if you don't turn up the T-55s, eventually you're bound to come across an isolated BMP or SAM launcher; maybe you'll even find an enemy chopper or two to shoot down.

After you've flown training in the Persian Gulf with an Apache, try it with a Kiowa Warrior or a Defender. Use your mast-mounted sight, and practice launching Hellfires to take out the BTR-60s from behind the hill. Another time, try an all-rocket training mission. Experiment with various routes, weapons, and attack strategies. Remember, the more experience you get during training, the greater your chances of success when it counts.

Once you've successfully completed training in the Persian Gulf, you should definitely train in Central Europe to familiarize yourself with the terrain and the types of enemy units you'll face in that part of the world. Here, your primary mission will be to engage and destroy a fixed radar site at 02/09, and your secondary mission will be to engage and destroy a T-72 mech group at 13/07. This time, however, you're likely to face even tougher defenders, such as 2S6s, BMP-2s, and Mi-28 Havoc gunships. If you haven't experimented with Sidearm missiles yet, this is a great place to try them.

The input data from each mission you fly are automatically recorded and listed as Last Mission on the mission playback screen. Following each training mission, rename Last Mission to save the recording. In the next section we'll look at how you can study your own mission films to learn from your successes as well as your mistakes.

If you have the Mission Builder upgrade, you'll also want to train in the two new Theaters of Duty—the icy world of Antarctica and the jungle environment of the Philippines. Again, experiment with various choppers, weapons, and tactics to see what works best in each setting. Soon you'll be able to handle the toughest missions in any part of the world.

LEARNING FROM YOUR MISSION FILMS

When I wrote *The Electronic Battlefield* in 1987, one of the techniques I used to study the original *Gunship* was to actually videotape my missions, using a VCR connected to the video output of my Commodore 64. While this allowed me to learn from my failures as well as to relive the glory of my battlefield successes, using a real VCR isn't nearly as convenient, useful, or enjoyable as using the mission recorder that's built into *Gunship 2000*.

Using an actual VCR to record your missions allows you only to review what you saw the first time around. However, recording mission films using *Gunship 2000's* mission recorder is much more flexible because, when you play back your films, you can view the action from any angle, watch the battle unfold from the viewpoint of any of the other helicopters in your flight, or even watch your attacks from your enemy's vantage point. If you want to replay the mission exactly as you saw it the first time, you can do that as well, by selecting DEMO from the *Gunship 2000* playback screen.

The *Gunship 2000* mission recorder works by recording only your input to the computer during a mission. Every time you press a key, move the joystick, or press a fire button, the computer makes a note of it along with the time it occurred. Then, when you save and replay the mission, it's as if the mission were being flown all over again—only this time it's the computer that's calling the shots.

This is the key to the system's flexibility. Because the *Gunship 2000* system records only your specific keypresses, joystick actions, and the times when they took place, it allows you to record long missions, sometimes lasting more than 30 minutes. Systems that try to graphically record what appears onscreen during a mission usually allow you to record only the last few minutes of action. The *Gunship 2000* system of input recording is also the reason why you can jump in at any time during playback of a mission film and

take control of the chopper yourself. The preprogrammed input from the mission film is halted, and you pick up where the computer leaves off.

Unfortunately, this system also requires you to let the film play through to reach a specific point in time during the mission. Since the computer has to actually play through the mission again using the recorded input, you can't simply enter a time and make the film automatically jump to that point. You can, however, replay the mission in fast-forward mode until you get to the part you want to see.

Press [F] or click on the Fast Forward key on the mission playback control panel. Also, by pressing [N] for Next, you can have the film automatically resume normal-speed play as soon as the first mission event occurs (destroyed target, hit to one of your helicopters, etc.).

One part of your mission that's not recorded by the mission recorder is everything that happens before you actually climb into the cockpit. Thus, unless you've documented your mission orders, S-2 report, and cockpit settings in some other way, many of the specific details regarding a particular mission can easily be forgotten when you go back to view that mission film several months from now.

The easiest way to save the specific information listed in your mission orders and S-2 report is to use a screen capture utility to take a picture of these screens when you view them before the mission. *Deluxe Paint*, for example, comes with a utility called CAMERA.COM that lets you capture (as .LBM files) graphic screens from other programs. These screen shots can then be viewed from within *Deluxe Paint* and printed to a graphics printer for later viewing.

If you don't have a screen capture utility, you can always jot down, by hand, information such as the primary and secondary missions, the S-2 report on target sightings and the level of enemy air activity, and the specific reality settings that were in effect during a particular mission. It takes a little more work than using a screen capture utility, but I think it's very useful for you to have this type of information at hand as you review your mission films.

Perhaps the biggest drawback of the *Gunship 2000* system of mission recording is that, with each upgrade to the software, mission films from previous versions can no longer be viewed. Once the program code is changed, the old input data become out of sync with the new program.

After you've flown a few training missions and saved your mission films, it's time to make some popcorn and sit back to watch the flicks. Leave the lights on, though, because you'll probably want to take plenty of notes.

When you load a mission film, the action starts right away. You initially see your chopper in a chase view in the replay window and, although you can't see your cockpit instrumentation or HUD from this external view, your airspeed, heading, and altitude are displayed at the top of the window. To the right of the replay window you can see the score you originally received for the mission, the total amount of time it you took to complete the mission, the number of kills you achieved during the mission, and whether both your primary and secondary missions were completed.

As the mission is replayed, each significant event is briefly described in a scrolling event list, along with the time it took place. Significant events include the destruction of enemy units, the loss of a friendly helicopter that's under your command, the completion of your primary or secondary mission, and damaging hits received by your helicopter or by any of the other choppers in your flight.

A control panel at the bottom of the replay screen allows you to select the helicopter you want to watch in action, manipulate the view, and control the playback speed. Unless you select DEMO, you watch all the action from outside your helicopter. During a multi-helicopter flight, you can also switch to any of the other helicopters under your command. No matter which helicopter you select for your vantage point, the four directional keys on the control panel can be used to change the altitude of your viewpoint, and to rotate it to any position around the selected helicopter.

For instance, you may want to position the external view to just slightly above and to one side of your helicopter as

you replay a low-altitude strafing run on a column of enemy tanks. From just the right angle, you'll be able to see both your own helicopter and the enemy tanks as the tanks burst into flames. When you select another helicopter by using the [2], [3], [4], or [5] key (your helicopter is always [1]), whatever relative position you chose as the external viewpoint for your helicopter will remain in effect for the new chopper.

One of the best things about replaying your mission films (aside from the fact that it gives you a chance show your friends and family what an ace *Gunship 2000* pilot you are) is that it provides an opportunity for you to solve some of those little battlefield mysteries that occasionally crop up during the missions. When the bizarre happens (and, believe me, it will!), the mission replay feature lets you go back in time to examine every detail of the mission.

Maybe one of your choppers seemed to vanish without a trace, or you crashed into some mysterious terrain feature that materialized out of thin air. Perhaps one of the helicopters in your flight reported shooting down an enemy MiG-23 that you never saw on the threat display, or maybe you just can't understand why one of your choppers ran out of fuel on the way back to base when everyone else made it back safely and with fuel to spare.

This last example is based on one of my own experiences. Following a particularly successful mission (the primary was to destroy an EE-11 platoon), I was returning to base when I got a strange radio message from Charlie 4—"I'm goin' in." I say "strange" because I was sure that he was following along just a klick or two behind me and hadn't engaged any enemy units. Maybe a self-propelled SAM turned up and got off a lucky shot before Charlie 4 knew what hit him? Maybe an enemy fighter got him? Aliens? The Iraqi Triangle? I was baffled.

After I landed, I immediately went to the mission film to try to figure out what evil force had ruined an otherwise decent mission. As the mission was replayed on the little screen, I paid close attention to the event list. 4:56—Infantry

destroyed by Charlie 5. No, that wasn't it. 6:18—Mi-24 destroyed by Oscar 1. Nice shot, but no . . . 8:00—Charlie 5 takes hit, starboard weapons wing, and so forth. Nothing seemed out of the ordinary. Then I saw it . . .

9:55—CHARLIE 4 TAKES HIT, FUEL TANK

I felt terrible. Charlie 4 had run out of fuel and had done a flying-squirrel imitation right into the side of a mountain, and it was all my fault. I should have paid more attention. Maybe monitored the condition of the choppers under my command more closely. I resolved to keep closer tabs on my guys in the future.

Solving such mysteries is just one way the mission films can be used to show you what you're doing right, and what you've done wrong when you've totally blown it. However, the most constructive way to use the mission recorder isn't simply to watch your old films from several different viewpoints. It's far more useful to jump in and resume control during playback so you can try the same missions again and again, using a different strategy each time.

If you do resume control during playback of a mission film and complete the mission again, you'll receive a *Resumed Score*, but you won't be able to resave the mission or receive any promotions or decorations for your accomplishment. Be warned, however, that the Resumed Score, at least in some *Gunship 2000* versions, can be slightly inaccurate. If you get a Resumed Score of, say, over 32,000, I wouldn't take it too seriously.

Even though you can't change your armament selection on subsequent attempts at the same mission, you can change your routes to see if approaching the objective from a different direction would have helped the attack. You can also try flying at different altitudes to study the effect of altitude on target acquisition.

By carefully reviewing the event list after a mission, you can analyze the performance of each pilot in your flight and evaluate the way the orders you gave during the mission

affected his performance. First, write down all the events in the exact order in which they occurred. Then extract from this a separate list for each pilot, including only those events that pertain to him.

Notice which pilots destroyed the most targets and took the least damage. See how a pilot's performance correlates with his pre-mission rank and the kinds of decorations he'd received. If you think a pilot could have done better with a little more instruction from you, resume control early in the mission and give more orders this time.

Valuable insights into the *Gunship 2000* scoring system can also be gained by slightly altering the outcome of a mission. For instance, during a resumed replay, by leaving an enemy unit untouched that you originally destroyed the first time around, you can get a good idea of the target's point value by comparing the Resumed Score to the original score. (Again, if the Resumed Score seems way off base, then the program may just be acting up.)

Similarly, if, at the end of a replay, you add just one more kill to the list, you can find out how many points that last unit was worth. If a mission was originally over at 29 minutes, replay it and just waste another minute or two so you can learn the scoring penalty for taking more than a half-hour to complete a mission. Waste another 5 or 10 minutes and see what happens to the score.

Of course, learning about the scoring system won't necessarily make you a better pilot. However, there are plenty of ways you can use the mission recorder to improve your skills. Say, for example, you want to practice a specific tactic such as carrier landings. Next time you fly a carrier mission, rename the mission Carrier Landings and save the film no matter how well or poorly you performed on the mission. Remember, you can save a mission film even if you plan to subsequently restore the previous Duty Roster.

When you replay the mission, immediately resume control while you're still on the flight deck. Don't even

bother setting any waypoints. Just take off, circle around the carrier once or twice, and set her back down on the deck. In this way you can practice carrier takeoffs and landings any time you want until you can do them in your sleep.

Other tactics, such as ripple-firing of Hellfire-A missiles, using the mast-mounted sight to acquire, designate, and destroy targets, autorotation landings, rocket-launching techniques, and dodging SAMs, can all be practiced by jumping back into the action of a previously recorded mission film. The idea isn't necessarily to try to top your previous scores. It's to learn as much as you can and to develop the specific skills you'll need in future missions.

For example, don't be afraid to resume control at the end of a successful mission, gas up at the base, and take off again for a little sightseeing tour. Try to cover as much ground as possible and to familiarize yourself with the unique terrain features of each mission map.

Keep in mind that you don't necessarily have to restrict your viewing to your own mission films. It's possible to exchange mission films with other *Gunship 2000* pilots as long as you're both flying the same version of the program. Check out the games and simulation forums on CompuServe to find other computer pilots who'll want to share their best missions and war stories. You can trade mission films through the mail, or they can be uploaded and downloaded directly on CompuServe.

Finally, remember that an existing mission film can also be edited with the Mission Builder and used as the basis for a brand new mission. If you think a particular mission is well designed but just needs a little tweaking to make it perfect, run the mission film through the Mission Builder. Move things around, give yourself some artillery support or air support, maybe add or delete enemy units as you see fit. When you're done, you'll have an excellent new scenario to play or to share with other *Gunship 2000* pilots.



PART 3

The Missions

(OR MY CAREER AS A GUNSHIP PILOT)

In the following pages, I will recount some of the *Gunship 2000* missions that I've flown, both as a lone gunship pilot on single-helicopter missions and as a flight leader in command of four other chopper jockeys. My purpose in including these missions isn't to brag about my battlefield accomplishments, but rather to describe the strategy and tactics that I used to achieve specific objectives.

I have included both some successful missions, and some that were, let's say, somewhat less than outstanding. There is often as much to learn from studying what didn't work as there is from studying what did. My hope is that by reading these accounts, you'll draw inspiration from my successes, while avoiding some of the pitfalls I encountered along the way.



Figure 3.1 Going it alone

ON YOUR OWN: SINGLE-HELICOPTER MISSIONS

Before you can hope to effectively command four other chopper jocks in a multi-helicopter flight, you must first establish yourself as one of the best combat pilots on single-helicopter missions. After all, what young Warrant Officer, fresh out of flight school, wants to take orders from another guy who just got his first set of Army Aviator Wings?

Single-helicopter missions come in just two flavors—*point attack* and *search & destroy*. In both cases, the objective is to make sure that by the end of the day you're out

celebrating, while the targets specified in your mission orders no longer exist. If the exact location of your targets is known, then the mission is considered a point attack. If the specific location is unknown, or if the targets are part of a moving group (a convoy of supply trucks, for example), then it's considered a search & destroy mission.

While it's certainly easier to find a target with a known, fixed location, it's seldom easier to destroy it. When it comes to mission objectives, the adage about a moving target being harder to hit just doesn't hold true. The reasons for this are simple.

Fixed emplacements, such as bunkers, depots, airfields, enemy headquarters, and so on, are usually heavily fortified and are protected by good quality SAM launchers and various types of triple-A. A mobile unit, on the other hand, may have some antiaircraft units defending it, but these units are usually spread out along the path of the moving targets, and are generally slower than fixed units to respond to incoming air threats. What's more, only some of the defenders in a moving objective will stop and turn to engage your helicopter, while others will attempt to continue on their merry way.

Thus, of the two types of missions, point attacks are frequently more difficult to complete successfully than search & destroy missions. The first mission I'll describe is a point attack that I conducted at the very end of my first tour in the Persian Gulf.

POINT ATTACK

During my career as a *Gunship 2000* pilot, I've heard too many stories of fellow pilots "buying the farm" just days before they were due to settle into cozy jobs as flight instructors at Fort Rucker. Maybe it's some final attempt at a Congressional Medal of Honor, or some desire to go out with a bang, that makes these guys get reckless at the end. I don't know. One thing I do know, however, is that when it came time for my 50th and final combat mission, I decided to play it safe.

I was a Lieutenant Colonel and, since there was no chance in hell I would ever make Brigadier General with just a single mission left to fly, I figured I might as well treat myself right. The enemy units would be among the toughest the other side had to throw at me; the conditions under which I was to fly would be the most difficult. But I was determined to take the most powerful, best-equipped chopper I could get my hands on. I picked up my mission orders, looked over the S-2 report, and headed to the armorer's tent looking for a Longbow Apache.

MISSION ORDERS

OPS NUMBER: ZMC097

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 0900 Hours

CALLSIGN: Foxtrot

PRIMARY MISSION: Proceed to 08/12 and Engage & Destroy Depot

SECONDARY MISSION: Proceed to 06/04 and Engage & Destroy Infantry Group

BASE: 02/10

FARP: 09/08

S-2

This is a day mission. The wind is from 110 degrees (SSE) at 14 knots. Visibility is excellent. Temperature is 96° F.

Enemy forces are expected to be on full alert throughout the area. Infantry, BTR-60, SA-9, and BMP-1 units have been sighted.

Enemy air activity is extremely heavy. Mi-8 Hip units have been reported.

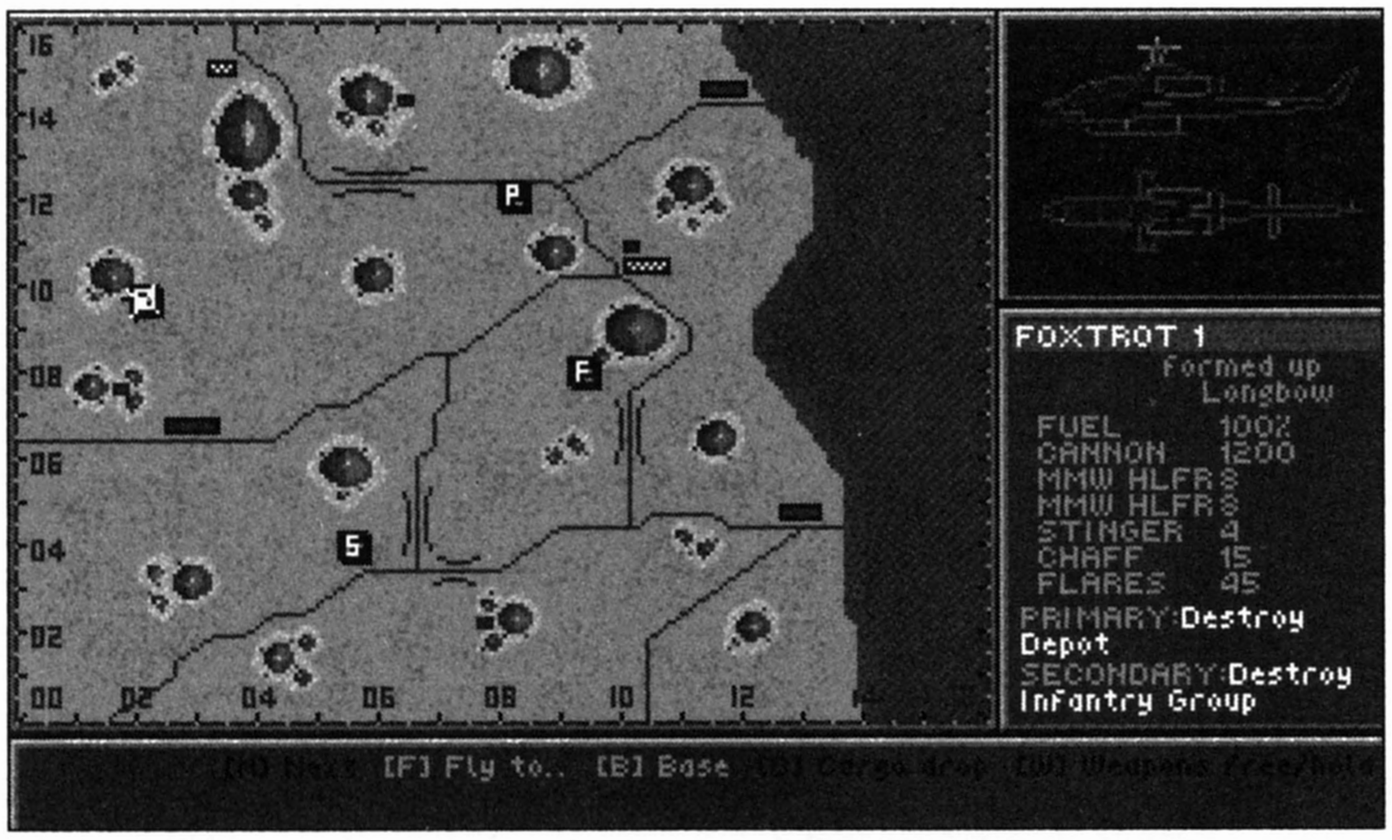


Figure 3.1 GPS map showing Primary, Secondary, FARP, and base

I loaded up the Longbow with sixteen MMW Hellfires and four Stingers on the wingtips. Looking back, I guess I would have been better off going with just eight Hellfire-Bs and some M255s to use against all the infantry I was about to encounter. However, since there was a FARP at 09/08, I figured that if necessary, I could afford to spend two Hellfires to wipe out each infantry squad. Since most infantry units carry IR-guided SAMs, I boosted my flares to a three to one ratio over chaff. I made sure I had a full fuel tank, and thought about all the things that can go wrong on a last mission.

The plan was simple. I'd maneuver the Longbow to a position just to the southeast of the depot. There was a hill there just about 4 klicks from the depot; if I could make it to the hill without being spotted, I'd be able to use my mast-mounted sight to acquire and destroy targets at will.

Once in the chopper, I called up the GPS map and plotted a course to the area. Unless there were some surprises en route, the most dangerous part of the trip would be a small open plain that I'd have to cross to reach the hill. I'd be in an open line of sight for close to a minute, just 5 or 6 km south of the primary. I knew that to avoid detection I had to stay low and keep my fingers crossed.

I took off from the base and headed to the northeast. I

stayed low—around 120 feet—and maintained an airspeed of around 110 knots. I armed the MMW Hellfires and sat back to enjoy the view. As the miles of sand and sparse vegetation rolled by beneath my helicopter, I had time to reflect on my career. It would be at least 12 minutes before I reached the objective.

As I entered the hilly area where I would set up shop, I decided to pull up at the first hill I came to and take a look around with the mast-mounted sight. I scanned in all directions, but the area was empty. I turned the chopper around and guided her gently back down the hill. A few more klicks and I'd be within range of the depot.

When I reached the final waypoint, I slowed the helicopter and moved forward toward the hill until my relative altitude started dropping. I reduced the collective slightly and pulled back on the cyclic while flipping on the auto-hover switch. Almost like magic, my forward airspeed was reduced to zero, and the helicopter began to rise slowly toward the top of the hill. I turned on the mast-mounted sight and began to scan toward the northwest.

I'm not sure what I expected to see first. Maybe a truck, a supply tent, or a self-propelled SAM. What I found instead was an Mi-24 Hind staring back at me from just over the top of the hill. Quickly I armed my Stingers and let one fly. Apparently the Hind pilot was even more shocked to see me than I was to see him. Without even getting a shot off, he started to turn and head away from the hill. It was too late. The Stinger caught him broadside, causing a shower of flaming Soviet chopper parts to rain down on the other side of the hill.

By now I could see the depot and, from the sudden activity down there, I could tell that the explosion had gotten their attention. It was also clear, however, that they had no idea where the missile had come from that had just made bacon bits out of the Hind. I made sure that my altitude was stable and that, except for the mast-mounted sight, the Longbow was well hidden. I then began lining up my targets one by one.

Since I wasn't in any immediate danger of being discovered, I looked over the situation carefully. Most of the targets that made up the depot were fairly harmless. There *was an ammo dump, a pair of trucks, a couple of supply* tents, and a third, smaller tent that appeared to house the depot's offices. This was probably where the paperwork for incoming or outgoing supplies would be handled. In place to defend the depot against air attack were a pair of SA-9s, an SA-6, and, as a last resort, an old Zsu-57(2).



Figure 3.3 Primary in sight

I began by picking off the SAMs. One Hellfire-B each was all it took. Likewise, I locked in the Zoo and fired. By the time the missile hit, however, I think the crew had probably already bailed out and were digging their way into the sand. M247 rockets would have been fine for this job, and I felt it somewhat of an extravagance to be using up all those expensive Hellfires. Then again, it was my last scheduled mission and I felt I'd earned the right to use whatever armament I wanted to do the job.

With the SAMs destroyed and the Zsu-57 in flames, I launched one more Hellfire at the ammo dump and decided to go in for a closer look. I felt it would be safe to go over the top of the hill and head down toward the depot to finish the job with my chain gun.

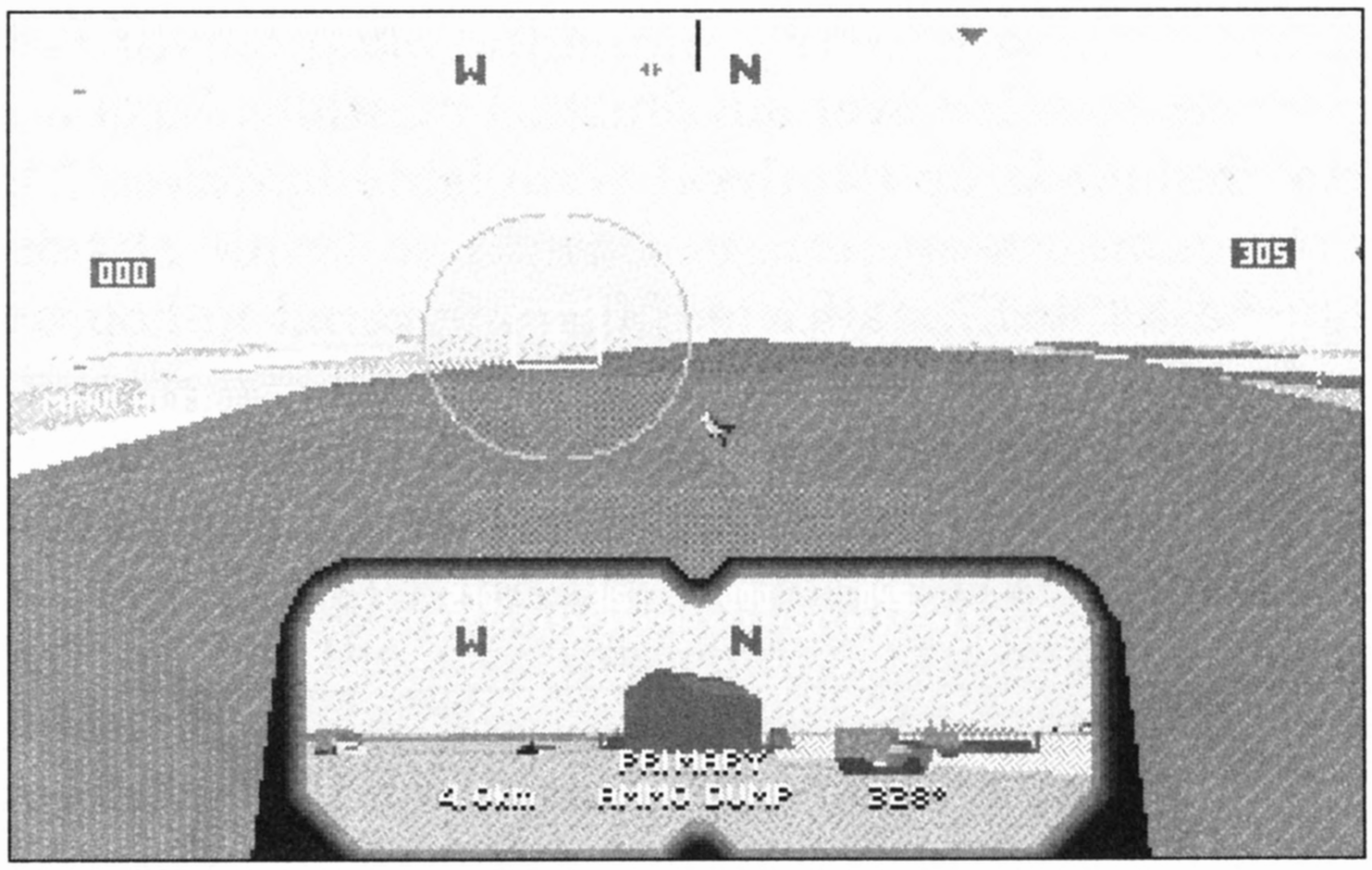


Figure 3.4 View from the mast mounted sight

With the depot's central tent fixed in my gunsight, I watched as the digital readout of the target's range slowly counted backwards: 3.1, 3.0, 2.9, and so forth. When I reached 1.4 km, I would open fire with my 30mm chain gun and take out the tents, trucks, and supplies with a just a few blasts. 1.8, 1.7, 1.6 . . . I got ready to fire . . .

"Incoming, right!" All at once I heard the CP/G's voice as the IR warning indicator went off. I checked the threat display and found a bright yellow blip zeroing in on me, with a big blue blip right behind it. Another Mi-24 Hind had apparently been lying low, waiting for me to come out of my hiding place to finish off the depot. Now I was out in the open, and the guy in the Hind seemed more than a little upset that I had single-handedly blown away his depot from the safety of the nearby hillside.

Without thinking, I activated the jammer and pumped out a couple of flares. The Hind was trying to circle around behind me from right to left, and I was doing everything I could to cut around to the right to get it in my sights. It was no use. It was moving too fast.

The first AAM grazed the side of the Longbow, but luckily there was no damage. For the first time I wondered if

I'd live to take that flight instructor job. I knew that if I was to get out of this one alive, I had to do something about that Hind. And quickly.

It seemed impossible to turn inside of the Hind so I decided to cut back to the left. The chopper banked wildly as I slammed the cyclic all the way to the left and kicked in the corresponding rudder pedal. It worked. Almost instantly the Hind flew into the left side of my view. I squeezed the trigger and 20 rounds shattered the Hind's cockpit. I fired once more; the enemy chopper burst into flame and dropped to the sandy deck below.

By now I was close to what was left of the depot. Sporadic machine gun fire started spraying up from some of the tents. I spun around toward the depot and emptied the rest of my rounds into anything that wasn't already smoldering.

"Got primary!"

No kidding.

So there I was, halfway through the mission. The primary was obliterated and my chopper had only suffered a scratch. Things were going great, right? Well, not necessarily. I was already more than 17 minutes into the mission and it would probably take at least another 10 minutes just to get to the secondary. (At least the FARP was on the way.) There was no way I'd be able to finish up and park my helicopter back at the base within 30 minutes. I'd probably be chewed out for taking too much time on the mission, but I didn't care. It would be the last time I'd ever have to hear about it.

I punched up the GPS map and set a waypoint for the FARP. Then I flipped on the autopilot and squinted out at the horizon for any obstacles that I'd have to manually circumnavigate. In 6 minutes I was on the ground and fully rearmed and refueled for the second leg of my final mission. I engaged the rotor and yanked up on the collective.

Just as I cleared the FARP and my airspeed began to pick

up, I acquired a target on the HUD. It was a lone BTR-60 off to the southwest. Before I could arm a Hellfire, the BTR had already spotted my chopper and launched a SAM.

Now I was grateful that I didn't have to carefully aim a rocket or wait around until a Hellfire-A missile reached the target. I simply armed an MMW Hellfire, fired at the BTR, and dropped out of the sky as quickly as possible, knowing that the MMW would find its target without any further help from me. Sure enough, the BTR exploded in the distance as his SAM flew harmlessly over my head. Superior technology triumphs again!

I decided I would handle the secondary just as I had the primary. I would fly to the closest hill—it was just north of the objective—and use my mast-mounted sight and MMW Hellfires to eliminate whatever I found on the other side. This time, however, I would make sure there were no surprises waiting for me when I came out of hiding.

I was almost 30 minutes into the mission before reaching the mountainous area where I would pull up to target the infantry units. On the threat display I could see an enemy helicopter of some type lurking in the area. I decided to find and destroy him before he found me.

The chopper turned out to be a Gazelle, a French-built utility helicopter like those the Iraqis fielded during the Gulf War. We danced around each other for a bit and, to be honest, the Gazelle probably could have shot me down once or twice if the pilot had known what he was doing. I probably should have gone in with my cannon, but instead I armed my Stingers and tried to maneuver for a good shot. I fired the first two Stingers without getting a good lock on the Gazelle, and they both buried themselves in the sand. Finally, I lined him up a third time and—sssss . . . BOOM!—knocked him out of the air.

With that matter settled, I proceeded to the southernmost hill in the range and worked my way slowly up the side of the hill to a position where I could just see over the top using the mast-mounted sight. Bingo! There were the infantry units—four of them, mind you—along with an EE-11, an

SA-6, and a pair of EE-9s. For the first time, the mission orders had been right on the money with the locations of both objectives. All that was left for me to do was to finish 'em off and head for home.

Again, I went after the SA-9 first. I launched a Hellfire but, while I was deciding which of the four infantry units to take out first, I inadvertently drifted up a bit too far and managed to get the attention of everyone down below. I cut the collective hard and began to drop back down behind the hill while everyone within 7 klicks who had a SAM launcher started firing at me. I switched back to the cockpit view and another Gazelle appeared on the threat display. I had only one Stinger left, but this time I made no mistake. Using my tail rotor control, I spun around while still in autohover mode, took dead aim at the Gazelle, and fired. Scratch another enemy chopper.

Any SAMs that had been launched at me either were successfully jammed or eventually lost track of me when I ducked down behind the hill. When the warning indicators on the cockpit showed no more activity, I slowly began climbing toward the top again.

The four infantry units were the next to go. It took at least two Hellfires apiece to put these guys out of commission. There were still a pair of EE-9s and an EE-11 down there. Since the EE-9s don't usually carry any missiles, I decided to save these guys for last and take them out at close range with my chain gun. I launched one more Hellfire at the EE-11; the CP/G confirmed that the secondary mission had been achieved. After finishing off the EE-9s with my 30mm chain gun, I punched up the map and planted a single waypoint on the base.

On the way home I took out a BMP-1 and another BTR-60 with Hellfires, and downed an Mi-8 Hip transport helicopter with my chain gun. More than 42 minutes from the time I'd taken off, I set the chopper back down at the base. Except for a little missing paint where that Hind had grazed me, the helicopter was in perfect condition.

Sure, I could have gotten a better score if I'd taken a

smaller helicopter or gone about my business a little faster. But I didn't care. This was the last mission of a long career, and I was just glad to be alive.

SEARCH & DESTROY

Here is a single-helicopter search & destroy mission that I flew during a tour of duty in Central Europe. The S&D portion, which was actually the secondary mission, turned out to be an unbelievable cakewalk. It was the primary mission, another point attack, that provided the real challenge.

MISSION ORDERS

OPS NUMBER: PBB310

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 0300 Hours

CALL SIGN: INDIA

PRIMARY MISSION: Proceed to 04/10 and Engage & Destroy Infantry Group

SECONDARY MISSION: Intercept T-72 Platoon moving west from 09/10 and Engage & Destroy

BASE: 12/09

S-2

This is a night mission. The wind is from 318 degrees (NW) at 6 knots. Visibility is good. Temperature is 58° F.

Enemy forces are on full alert throughout the area. 2S6, infantry, BMP-2, and towed gun units have been sighted.

Enemy air activity is extremely heavy. Ka-34 Hokum units have been reported.

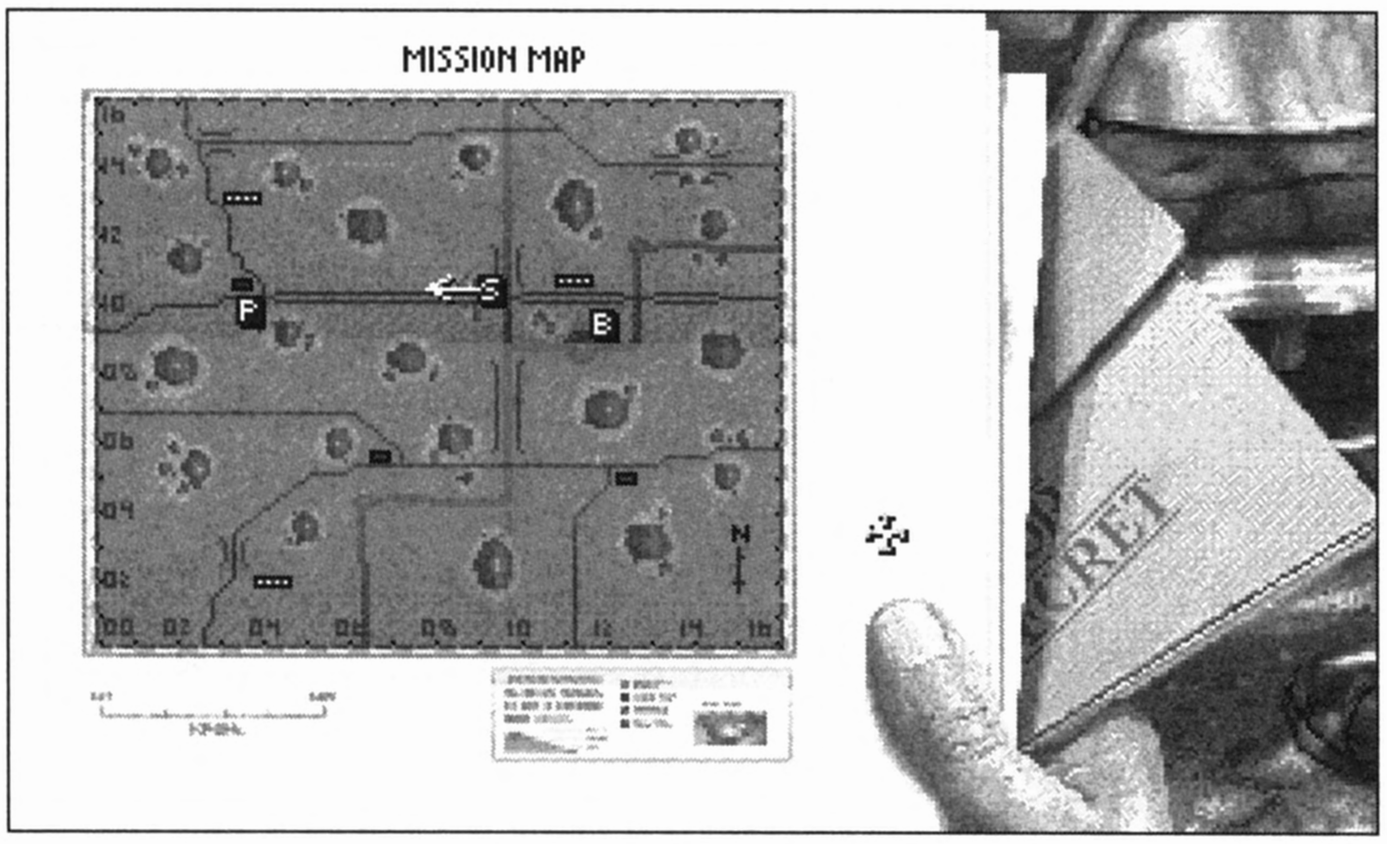
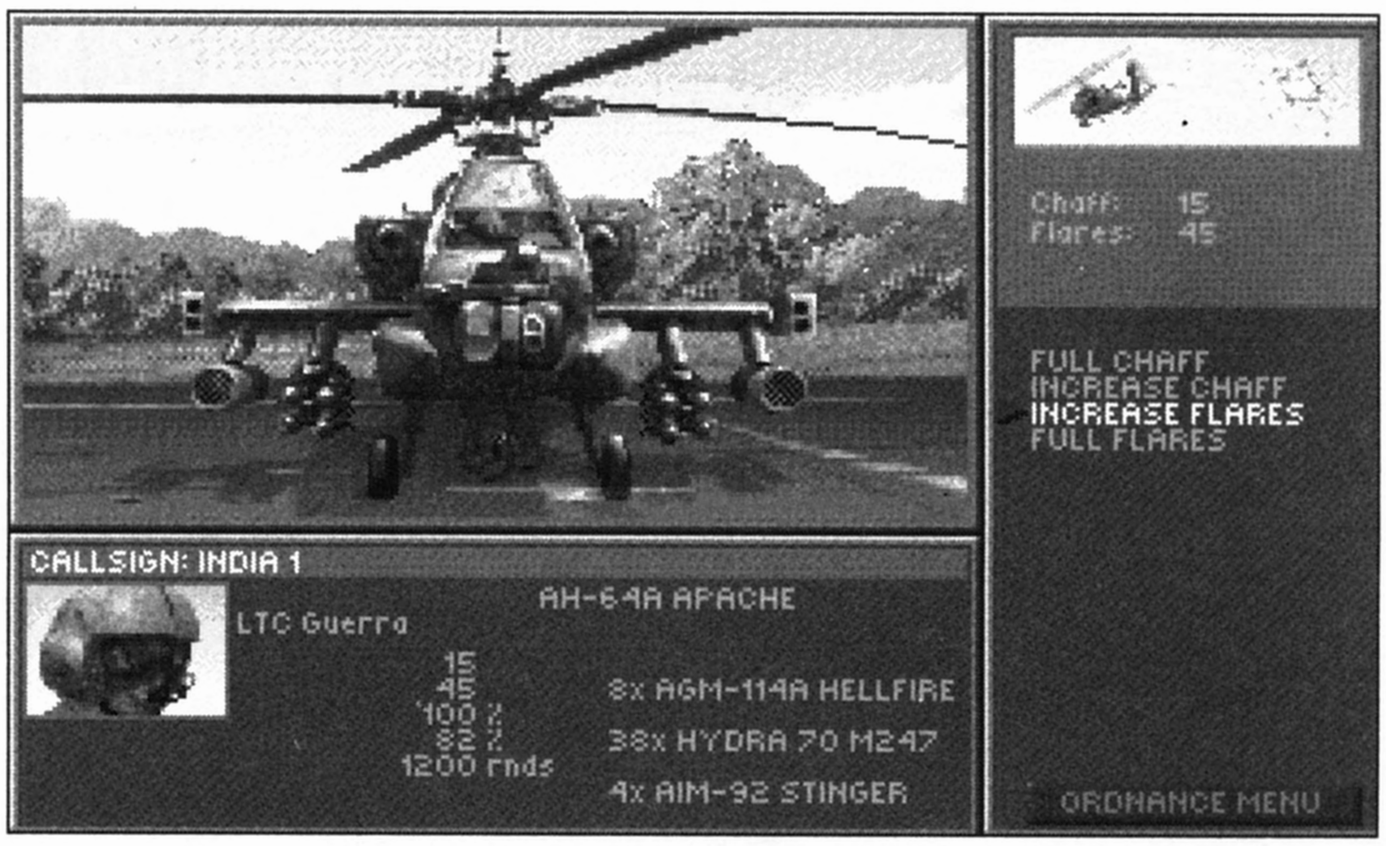


Figure 3.5 I checked the mission map . . .

Some guys hate night ops. Me? I thrive on them. There's just something exhilarating about streaking over the treetops at close to 200 mph with nothing but the moon to outline the landscape, and the glow from your MFD lighting the cockpit. Besides that, our FLIR-equipped choppers beat anything the other side has when it comes to seeing in the dark.

When I got to the flight line, there was an AH-64A Apache waiting for me. I kept the eight Hellfires that were already on the inboard stores, and got thirty-eight M247s loaded onto the outboard stores. Since the S-2 promised some "extremely heavy" air activity and said that Hokums had been reported, I took four Stingers. As usual, I boosted my flares a bit, gassed her up, and climbed aboard.

Figure 3.6 Decisions, decisions



Both the primary and secondary objectives were almost exactly due west of the base; the secondary, a

westbound T-72 platoon, was only around 20 km away. It would be a simple matter to sneak around just to the south of the T-72s and ambush them as they rolled down the highway.

I wound up the Apache's turbines and took a look at the GPS map. The low-scale map showed a few small hills bordering the highway to the south of where the tanks would be passing in just a few minutes. If I got into position quickly enough, the platoon would drive right into my gunsights.

After setting a couple of waypoints, I cranked up the collective and headed west as fast as the chopper would take me. The CP/G, who at first had seemed half asleep, now had both eyes wide open. He was a young guy, and I could tell by the way he nervously watched the dark scenery rush by the helicopter that he hadn't done much night flying.

I think we set a record that night. Just 4½ minutes after takeoff we were coming around a hill to face the highway when the CP/G choked out the words *"Target front!"* The MFD showed a big old T-72 less than 3 klicks directly in front of us. I really hadn't expected the tanks to be there yet and, I have to admit, I panicked a bit.

Immediately I pulled the trigger and a Hellfire hissed before bursting from the starboard weapons wing with a bright flash. Not wanting to waste a Hellfire on a tank, I checked for other targets. "Target front . . ." Another T-72. "Target Front . . ." A third. I checked again and again, trying to acquire something a little more dangerous than a T-72. Certainly there had to be something else out there. Each time I acquired another T-72, the Hellfire swerved to try to find the new target. Eventually it just impacted on the road.

By now I was within 2 km of the tanks and I could hear machine-gun fire spraying up from the highway. Still I could find nothing more dangerous than the three tanks. I armed my chain gun and began firing back. One squeeze; the first tank was still rolling. Another, and still nothing. After the third burst, smoke began billowing out of the turret. Likewise,

the other two tanks took a few hits each before they died. I turned to the wide-eyed CP/G. "Havin' fun yet?"

If the T-72s had any type of escort, it didn't hang around very long. When I was done, there were three dead tanks on the road and not a defender in sight. Oh, well, maybe the primary would provide a few thrills.

I could have kicked myself for wasting that Hellfire on the T-72s. The primary was still a long way off and I had no idea what I'd encounter along the way. Even though I still had a whole pod full of M247s, I knew that somewhere down the line I'd need that Hellfire.

I plotted a new course to the primary and again aimed my chopper to the west. The next target I acquired was a Zsu-23(4), off to the left. We both fired missiles at the same time and I activated my radar jammer. As its missile got closer, I popped off a couple of chaff canisters and successfully maneuvered away from the incoming SAM. Unfortunately, in doing so I lost my target lock on the Zoo and my first Hellfire missed. I launched another, this time from closer range, and the Zoo exploded before burning through the jammer.

Just seconds after I destroyed the Zsu-23, a 2S6 appeared up ahead off to my right. This time, both my radar and laser warning indicators began to glow. Again I fired a Hellfire and tried to jam the 2S6's radar guidance system. The only thing I could do about the laser designator was to drop down and try to sneak under the beam. As I maneuvered the Apache, I momentarily lost my target lock on the 2S6, but the Hellfire stayed on course. It knocked the 2S6 on its side as if it were some kid's toy.

With all of the radar guidance systems I was up against, I was beginning to think I should have armed a pair of Sidearms instead of the Stingers. Before long, however, I spotted a Ka-34 Hokum dead ahead at 2.5 klicks, and I was glad I wouldn't have to get within cannon range to take him out. The first Stinger I fired hit the Hokum in the tail boom, but the Soviet-built chopper kept flying. The second Stinger

got a better piece of the enemy helicopter and it went down without launching a single AAM.

Despite the report that enemy air activity was extremely heavy, that was the last enemy chopper I would face during this mission. However, four more defenders stood between me and the primary.

After 9 minutes I spotted an infantry squad at a distance of about 2½ km. Since I was flying at 118 feet, this was the range at which I acquired most targets. I quickly launched two Hellfires, fearing that a single missile wouldn't be able to do the job. It did, though, and the second Hellfire simply exploded into the rubble. Meanwhile, I successfully decoyed an IR-guided missile that the infantry squad had sent my way.

As soon as I got realigned with the INS pip, an SA-11A Gadfly popped up on the horizon. I flipped on my radar jammer and launched a Hellfire toward the Gadfly while monitoring the incoming SAM on the threat display. The MFD showed the disintegration of the SA-11 as the Hellfire slammed into it with tremendous force. I turned off the jammer.

It was almost 10 minutes into the mission and I still had suffered no damage. With just one Hellfire left and an infantry group to destroy, however, I knew I was in for trouble. The next defender I came across was a 2S6, which I blasted with my last Hellfire missile. Unfortunately, before I got the 2S6, he got me, with a radar-guided missile that wasn't the least bit interested in the chaff cloud I left behind the Apache. The chopper took one on the nose, but luckily the optics system was only damaged—not totally destroyed.

With my Hellfires gone (at least I got to use them all before losing a weapons wing), I switched to the Hydra 70 rockets and checked the map again to see if another route would get me in closer to the infantry group before I had to unmask. Without Hellfires, I would have to take on the primary with just my chain gun. The M247s would be totally ineffective against the infantry squads.

The last defender I encountered before reaching the primary was a lone BTR-80. I used the tail rotor control to line him up, then pulled back on the cyclic to raise the chopper's damaged nose. The target was locked in for just a second or two and I launched a salvo of two rockets. By now my chopper was rapidly gaining altitude and I quickly found myself up close to 300 feet. I lowered the collective and tried to push my nose back down to avoid the incoming missiles. Too late. As I turned the chopper around, a SAM hit the tail boom and damaged my avionics system. I would be without a threat display for the rest of the mission.

Two more minutes passed as I made my way toward the primary. I armed my chain gun and prayed that I'd be within range to use it when I spotted the infantry group. The first squad appeared at just over 2 klicks. I would have to shave at least another half-klick off the range before I could hope to do any damage with the chain gun. Immediately, I pushed my nose down to lower my altitude. I hoped to sneak under their radar but it was no use. *"Incoming front!"* I angled the chopper toward the left, flipped on the IR jammer, and started pumping out flares. *"We're hit!"* The chopper listed as the port weapons wing was cleanly severed from the rest of the chopper.

Gradually the distance to the infantry squads decreased. Before long I was within cannon range. My only hope was to head straight into the group and keep firing. Three squeezes of the trigger and the first squad was gone. A couple more and another infantry squad went up in flames. I kept on firing.

Next a BTR-80 exploded in front of my helicopter. *"Incoming front!"* I wasn't carefully selecting targets; I was just firing at anything that got in my way. A BRDM-2 was my next victim. Smoke billowed up from the ground and out of the smoke came a streaking SAM. *"We're hit!"* This time my starboard engine was damaged, but I kept firing. One more infantry squad became a smoking black hole in the ground, and the mission was over.

I decided not to look for any more trouble on the way home. I punched up the GPS map and carefully retraced my path back to base. On the map, I noticed a towed gun just out of range to the north. For a second I considered taking him on. Too often, however, those "one-on-ones" have a tendency to shake other defenders out of the woodwork, so I decided to ignore him. The return trip was uneventful and I landed safely back at base.

TAKING COMMAND: MULTI-HELICOPTER FLIGHTS

Eventually the day will come when your skill as a gunship pilot will pay off with a promotion to the rank of 2nd Lieutenant. This commission means that you can now command multi-helicopter flights. No matter how much of a rising star you've been up to this point, your career will go nowhere fast if you don't have what it takes to lead a group of chopper jocks into battle.

Your first responsibility as flight leader will be to select and arm the choppers your men will take into combat. Don't take this duty lightly! Just like you, your men can only do their jobs if they're given the right tools. Select their helicopters and weapons as carefully as you do your own. Since the number of different weapon types that a single helicopter can carry is limited, don't give everyone in a section the same weapons configuration. For instance, you may want to arm one chopper with Hellfires, M247s, and Sidearms, and arm another with Hellfires, M261s, and Stingers. This way, the team can work together to deal effectively with a greater range of threats.

Also, make sure that everyone has enough fuel to get where they're going. Nothing is more frustrating than finally finding and destroying an elusive target, only to realize that none of the helicopters in your section have enough fuel left



Figure 3.7
SuperCobras at the base

to make it back to base. Similarly, check to see that everyone has a proper chaff/flares ratio to defend against the enemies you expect to encounter.

When you're handing out the assignments, pay close attention to the rank and number of decorations of each pilot under your command. New pilots have to be given time to develop their skills before they can be expected to successfully complete the tough assignments on their own. Instead of sending rookies out on point attack missions, you should give them cargo transport missions or let them

taxi troops around the battlefield. They should be able to deal with the isolated defenders they come across during these easier missions, and the experience they gain along the way will prepare them for tougher assignments in the future.

You should usually lead the heavy section yourself and assign the pilot who's second highest in rank as leader of the light section. Once the mission starts, it's not necessary to direct the actions of each friendly helicopter individually. Choppers within a section will follow the flight leader with respect to heading, airspeed, and altitude. Thus, even though you can give orders individually to each helicopter in a flight, a section will usually work more efficiently if you simply give all orders to the section leader.

During a mission, call up the GPS map frequently to monitor not only the positions of all the helicopters in each flight, but also the condition of each chopper. By cycling through the choppers using [N] (next), you can check on their weapon stores, chaff, flares, and the amount of fuel each has remaining.

If you notice, for example, that one of the five helicopters has only 47 percent of his fuel left when everyone else still has 50 percent, he's suffered damage to his fuel tank. A look at the schematic in the top right-hand corner of the map screen should confirm this. At this point, you should evaluate whether the helicopter in question has enough fuel to complete the mission. If not, it should be sent back to base immediately via the same route it used to reach its present position.

When a chopper under your command reports that it's engaging an enemy unit, check the map again to see whether it's just stumbled onto an isolated defender, or if it's uncovered a pocket of stiff enemy resistance comprising several units. If the action is close by, you might consider lending a hand with the section you're flying with.

Whatever you do, don't ignore your men when they tell

you they're taking damage. Stop the action right away by *punching up the map. Then take a good hard look at the situation. What type of unit is the chopper up against? Does your guy have enough of the right type of ordnance to stand* up to this enemy? If so, will damage to systems involved with navigation or target acquisition and designation prevent him from getting the job done?

If the chopper isn't too badly damaged and you think it stands a chance against the defender, let them continue to battle it out. Otherwise, you should command the helicopter pilot to disengage from the target as soon as possible. He'll try to break away from the defender and fly to a safe zone. In some cases, such as when there are simply too many defenders in the area, you may even have to tell the pilot of a severely damaged chopper to hold his position or even land and wait until your section can get to him and escort him to safety.

Again, I can't emphasize strongly enough how important it is to take care of your guys. You'll be amazed by how well your pilots will perform once they've matured and advanced through the ranks. Remember, a top-notch friendly will be able to handle any mission and hold his own against the toughest opponents.

POINT ATTACK

Until I flew this point attack mission in Central Europe, I never realized just how much punishment an AH-64 Apache gunship could withstand and still keep flying. With damage to almost every major system on the Apache, and both weapon wings destroyed, I somehow managed to get my chopper back to base. This was by no means a Congressional Medal of Honor winner, but it was among the most thrilling missions of my career.

MISSION ORDERS

OPS NUMBER: DZL007

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 2300 hours

CALL SIGN:Yankee

PRIMARY MISSION: Proceed to 04/03 and Engage & Destroy Headquarters

SECONDARY MISSION: Proceed to 12/04 and Extract Troops

BASE: 08/09

S-2

This is a night mission. The wind is from 193 degrees (SSW) at 24 knots. Visibility is good. The temperature is 63° F.

Enemy forces are expected to be on full alert throughout the area. Infantry, Zsu-23(4), towed gun, and 2S6 units have been sighted.

Enemy air activity is expected to be extremely heavy. Mi-24 Hind units have been reported.

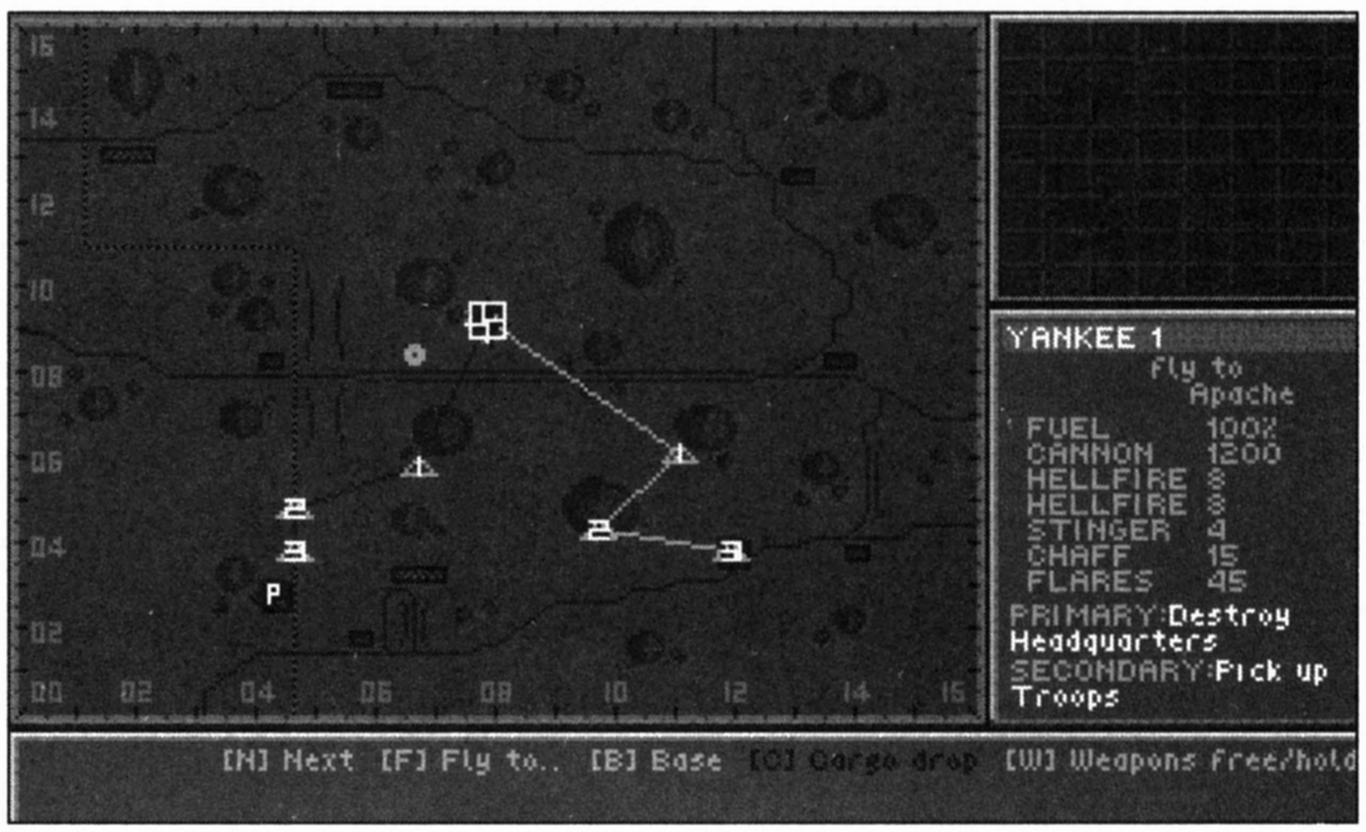


Figure 3.8 Setting waypoints

Enemy headquarters are always tough targets to eliminate. Without guidance from the HQ, most field units wouldn't have a clue as to what their objectives should be, except to hold their ground and wait for a new line of command to be established. That's why most headquarters are usually heavily fortified and defended by the best units available.

Realizing that the job ahead would not be easy, I was happy to see three Apaches waiting on the flight line for the heavy section. These would let us carry enough armament to take out any defenders that got in our way and to obliterate the headquarters and its supporting units.

I armed my Apache with sixteen Hellfires and four Stingers. I would lead the way and go after any enemy air threats that showed up. I gave eight Hellfires, thirty-eight M247s, and a pair of Sidearms to Yankee 2. Yankee 3 was armed with eight Hellfires, thirty-eight M261s, and Sidearms. If I could just lead these guys to the HQ, they'd be able to wipe it off the map.

The light section, India 4 and India 5, consisted of a Kiowa Warrior and a Black Hawk, respectively. The Kiowa was armed with two Hellfires and nineteen M255 Hydra 70 rockets; the Black Hawk carried seventy-six M261s and eight Hellfires. Their job would be to fight their way into the area of 12/04, locate the pinned troops, and get them safely out of there.

We headed out just after midnight; the clear air was starting to cool down. The headquarters was located at 04/03, just to the west of the railroad tracks. I plotted a course that would take us through a hilly area and then to the tracks. A few klicks north of the headquarters were two rail tunnels. I determined that we could sneak up on the primary by flying along the tracks and through the two tunnels from north to south.

The first pocket of enemy resistance was encountered by the light section just 4 minutes into the mission. "Engaging Zsu-23," came the radio message from India 4. I called up the GPS map and adjusted the light section's first waypoint

to head them straight for the Zoo. After a few seconds, India 5 joined the battle. I could hear the explosion in the distance, and another check of the map showed that the Zoo had been destroyed. India 5 got the kill.

A minute later there was more trouble. This time a 2S6 got in the way of the light section, and again India 5 eliminated the threat. Then the real trouble started. A BMP-1 surprised the light section and started launching SAMs at the Black Hawk. India 5 managed to destroy the BMP, but not before taking damage to his optics and losing his starboard weapons wing. Instantly, half of his remaining Hydra 70s were gone. Things were still quiet on our side of the map.

The next target to challenge the light section was another Zsu-23, which managed to hit India 5, damaging his fuel supply. This time, India 4 stepped in to blast the Zoo. Things weren't going great for the light section, but there was still hope. The objective had been sighted. Despite the enemy resistance, India 4 and 5 were closing in on the secondary.

Meanwhile, we were starting to face some resistance over in the west. The first enemy unit I saw was an infantry squad, which I blasted with Hellfires. They managed to hit my chopper with a single missile, but there was no damage.

On the second encounter, however, I wasn't as lucky. I spotted a 2S6 off to the left and fired another Hellfire. The 2S6 launched a missile and I tried to spoof it with chaff. Unfortunately, I couldn't really maneuver out of danger while trying to maintain a lock on the 2S6, so the missile slammed into the chopper's nose and damaged my cannon. Almost simultaneously, the 2S6 was pounded into the dirt by the Hellfire.

Then some good news. *"Got secondary!"* As happy as I was that the troops had been picked up, I knew that their flight back to base wouldn't be easy. I took a look at the map and tried to guide them back through the area they'd already fought through to get to the troops. Unfortunately, enemy reinforcements were plentiful this day, and things

would get a lot worse before they got better.

By this time, we had reached the tunnels and were making our way through them at an altitude of just over 110 feet. Yankee 2 and 3 fell in behind my Apache and the three of us barreled through the tunnels in a single line. We knew there would be a hostile reception waiting for us at the other end and prepared for the worst.



Figure 3.9 Tunnel vision

As we emerged from the southern end of the tunnels we were ambushed by a 2S6 just off to the southeast. I spun around and killed it with a Hellfire before losing my port weapons wing to one of its radar-guided missiles. Close to the burning 2S6 was a towed gun, which I eliminated in similar fashion. The HQ was still just out of range, so I readjusted my course back to the west and headed straight toward the primary.

Then came some distressing news from the light section. India 5 was again taking damage, this time to its port weapons wing. With both the Black Hawk's

Figure 3.10 Hellfires locked on 2S6



weapons wings gone, it began to look doubtful that those troops would make it back to base.

As the primary came into view, it was time for my wingmen to get into the action. Yankee 2 started the festivities by blasting a towed gun that was guarding the perimeter of the camp. I used a couple of my remaining Hellfires to take out an infantry squad that was posted just outside of the HQ. I was hit again, however, and this time my optics system was damaged. At almost exactly the same time, Yankee 2 took a hit that seriously damaged his port engine.

With his M261s, Yankee 3 began by targeting a building, and then the HQ tent. *"Got primary!,"* announced the voice of my CP/G. But the battle was far from over.

Now I was in close, so I armed my damaged chain gun and started to blast away (when the gun would fire) at the clustered targets that remained. First I obliterated an infantry squad. Then a truck cab and its trailer. I felt the helicopter buck as I took another hit but a glance at the damage display told me that this time I'd been lucky. No damage.

All the targets at the location of the primary were now rubble, but there were plenty of defenders in the area who weren't ready to just give up and let us return to base without a fight.

Over the next couple of minutes we tried to make our way back to the tunnels, but defenders were popping up all over the place. I gave a new flight command to Yankee 2 and 3 to try to direct them toward some of the hot spots in the area. I killed a towed gun and, just seconds later, a Zsu-23. Then Yankee 3 found an identical team of defenders—a towed gun with a Zoo—and wiped them out. Meanwhile, Yankee 2 zeroed in on yet another infantry squad.

Thus far, the heavy air activity that had been promised in the S-2 had yet to materialize, but that was about to change. *"I'm taking damage!"* Yankee 3 called as an AAM slammed into his tail boom. On the threat display, a blue blip had appeared and was coming to the defense of the ground units.

I armed my Stingers as I pulled around to try to line up the enemy chopper. It was an Mi-24 Hind that was hot on Yankee 3's tail. I quickly launched two Stingers at the Hind, and both exploded violently into the helicopter. Yankee 3 owed me one.

In all the excitement at our end of the map, I had almost forgotten about the light section. Then I heard the distress call from India 4 . . . *"I'm taking damage."* If there was some way we could have reached them to escort them back to base, I would have instructed them to land immediately and brought the heavy section in to clear a path for them. As it was, however, we'd be lucky if we made it back to base on our own.

We finally made it back through the tunnels, thinking the rest of the trip home would be a breeze. It was anything but! At close to 13 minutes into the mission, Yankee 3 took a hit to his starboard engine before destroying the culprit—another 2S6.

Back on the other side of the map, India 5 took a fatal hit from a towed gun. It was the second hit to the Black Hawk's fuel tank and, consequently, all 11 troops that had been extracted went down with the Black Hawk. India 4 returned to base alone.

At the 18-minute mark I heard *"Incoming right!"* An IR-guided surface-to-air missile was headed my way. I turned on my jammer and dumped out a flare before cutting away from the missile. As I dove, the SAM tore into my main rotor blade, causing me to lose control of the chopper. Although I could maintain a fairly steady heading, my altitude was almost impossible to control.

I was out of Hellfires and unable to get close enough to use my damaged chain gun on the infantry squad that had launched the SAM. Instead, I directed Yankee 2 and Yankee 3 toward the infantry squad while I tried to make it to a nearby hill. Again I heard *"Incoming right!"* and immediately took a hit to my starboard engine. *"Incoming rear!"* and my avionics system was hit. Finally, the infantry squad was

destroyed, but I didn't know if I'd make it home in one piece.

With both hands on the cyclic, I tried to keep the chopper down. Within just a few seconds my altitude would climb up near the 400-foot mark and drop back down again to about 250. I feared that if I tried to push the chopper's nose down too hard, I'd be unable to pull out of the dive. Finally, I flipped on the autopilot and that helped to stabilize the helicopter somewhat.

I ordered Yankee 2 and 3 to regroup, but it would be a while before they caught up with me. Before they did, I took two more hits—one to my starboard weapons wing, and the second to my fuel tank. When I finally reached the base, I could see India 4 putting the Kiowa down just ahead of me. I wasn't even sure I'd be able to land with the rotor so banged up, but with the help of the autopilot and a gentle hand on the collective, I finally set her down. I disengaged the rotor, got out, and kissed the ground.

SEARCH & DESTROY

Here was a fairly well planned and executed mission—that is, until I was shot down at 17:45, just seconds after destroying the primary objective.

MISSION ORDERS

OPS NUMBER: TBS205

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 0900 Hours

PRIMARY MISSION: Proceed to 04/04 and Engage & Destroy T-72 Mech Group

SECONDARY MISSION: Proceed to 04/10 and Pick Up Troops

BASE: 11/09

S-2

This is a day mission. The wind is from 110 degrees (SE) at 17 knots. Visibility is excellent. Temperature is 78° F.

Enemy forces are on full alert throughout the area. SA-13, BMP-1, towed gun, and Zsu-23(4) units have been sighted.

Enemy air activity is light. Mi-8 Hip units have been reported.

The theater of duty was Central Europe, and our base was at 11/09. The primary mission was to destroy a T-72 mech group that was moving northeastward from 04/04. The secondary was a search & rescue operation to extract troops who were pinned down near 04/10. I decided that, under my command, the heavy section, callsign X-Ray, would go after the mech group while the light section, Sierra 4 and 5, looked for the troops.

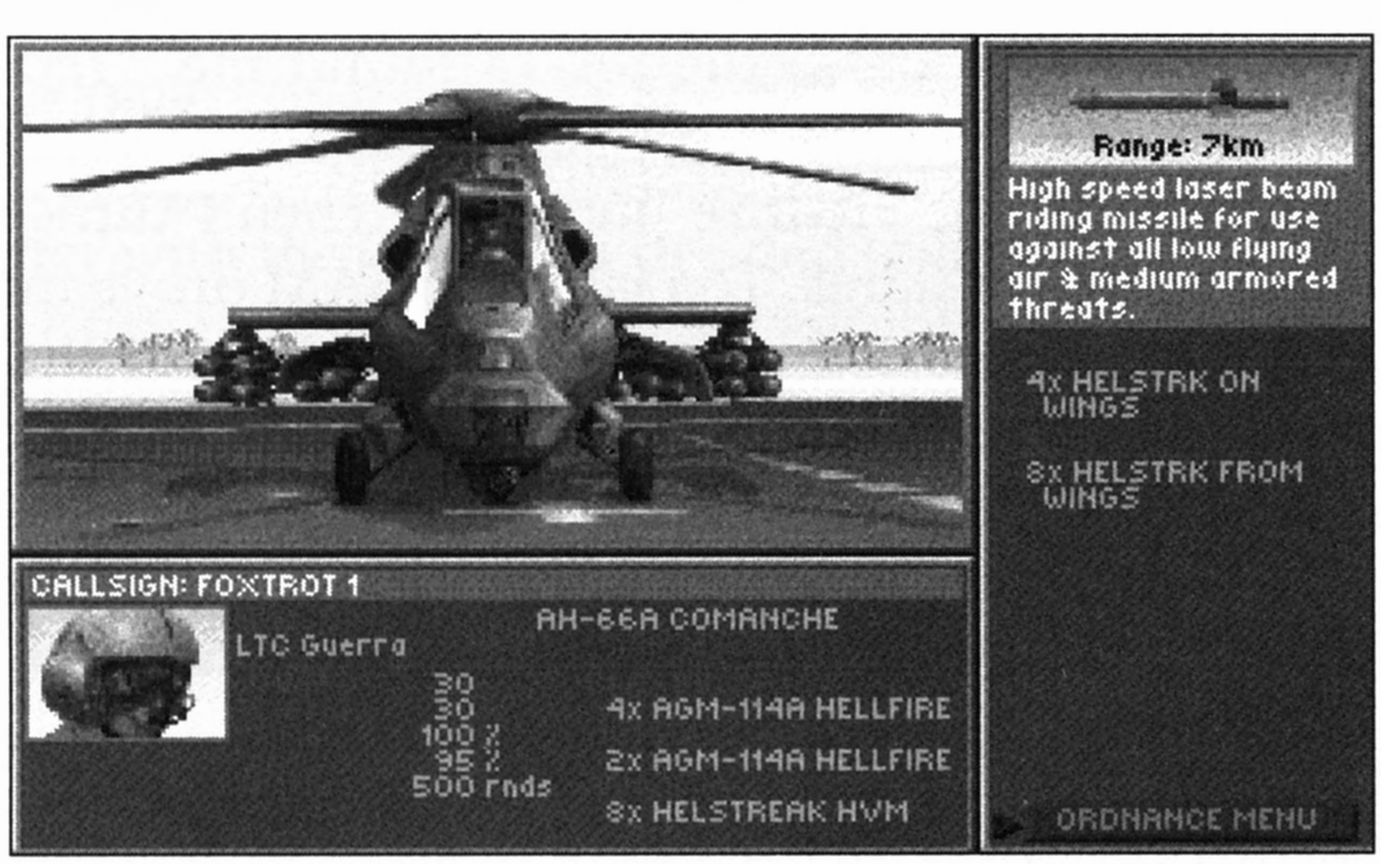


Figure 3.11 Comanche at the armorer's tent

I took a Comanche gunship armed with six Hellfires and eight Helstreaks. I assigned X-Ray 2 and 3 each an Apache. X-Ray 2 loaded up with eight Hellfires, thirty-eight M255s, and a pair of Sidearms strapped onto his wingtips. X-Ray 3 went with Hellfires, M261s, and Sidewinders. I figured we were ready for anything. Sierra 4 was flying an Apache

armed identically to X-Ray 2's. The troops would be picked up by Sierra 5, a Black Hawk armed with eight Hellfires, and seventy-six M261s. If you stood that Black Hawk up on its tail rotor and fired off all of those rockets at once, the thing could've gone into low-level orbit.

We headed out just after sunup, into a cloudless sky. Except for the beating of our rotor blades, the air was quiet and still. We all knew it wouldn't last.

About 4½ minutes into the mission, Sierra 5 broke the radio silence . . . *"Engaging enemy SA-13."* Then I heard the rumble of explosions off to the north as Sierra 4 came over . . . *"Engaging enemy BMP-1."* More explosions. Seconds later, Sierra 5 took out a 2S6 with rockets. Five minutes into the mission and the light section had already destroyed three targets. They had yet to receive a single hit. Things were going well.

Then it was my turn. At 5½ minutes I picked up my own SA-13 at three klicks and quickly dispatched a Hellfire. Before it found its mark, the SA-13 found me. *"Incoming front!"* the CP/G warned. I flipped on the IR jammer and held steady until the Hellfire impacted. Then I turned and let loose a couple of flares. Too late. The SAM drove into my fuel tank with a force that made the whole chopper shudder. Just a fuel leak, I thought. I decided to press on.

At close to 7 minutes, Sierra 5 was at it again. *"Engaging enemy BMP-1."* For someone in a flying cargo van he was doing all right. The BMP-1 exploded violently, but not before lopping off the Black Hawk's starboard weapons wing with a SAM. No big deal. The troops were in sight, and that BMP-1 would be the last enemy unit Sierra 5 would have to face. By 9:21, the secondary mission was achieved and the light section was headed back to base. For the heavy section, however, the excitement was just starting.

I led the way as we flew westward. As we got closer to the area where I expected to find the mech group, more and more defenders began popping up. A towed gun appeared on the threat display off to my left. I pulled around and

killed it with a single Hellfire. Then an SA-13 came into view. Again, I made quick work of it. Another SA-13 got in my way and I blasted him, but not before taking a hit to the tail boom that damaged my avionics system.

Then I made the most serious tactical mistake of the mission. I cut around a hillside, only to be surprised by three enemy units. The TADS locked onto a towed gun first, so I launched a Hellfire in its direction and ignored the second and third blips on the threat display. These turned out to be a pair of Zsu-23s, and while I maintained a lock on the towed gun, the Zoos started tearing into my chopper. I took a direct hit to the cannon. Then another. Before I even had time to arm the thing, my 20mm gun was destroyed. The Zoos kept firing.

Next I took a hit to the starboard engine. By now I was practically right over the Zoos and couldn't seem to maneuver for a shot. *"Engaging enemy Zsu-23,"* I heard over the noise. There was a loud explosion. A few seconds later, another. Then silence. I looked back to see both Zoos in flames. *"Thanks, X-Ray 3."*

My chopper was pretty badly damaged from the encounter with the Zoos, so I decided to let the Apaches take the lead for a while. In the next few minutes X-Ray 2 and X-Ray 3 each bagged an SA-13, and each took a hit to the cannon for their troubles. The S-2 had said there were lots of SA-13s around, but this was getting ridiculous. Meanwhile, I killed a towed gun that was paying too much attention to the other choppers to notice me.

I started to think seriously about turning around and heading back to base. It was almost 13 minutes into the mission and my cannon was destroyed, I was running low on missiles, and I was losing fuel at a dangerous rate. But the number of defenders in the area told me the T-72s couldn't be very far away. Plus, now that X-Ray 3 had saved my butt from those Zoos, I felt I owed it to him to hang in there a while longer.

Then, at just after the 13-minute mark, a towed gun



Figure 3.12 X-Ray 3 bearing down on enemy infantry

appeared on the horizon like some target in a bizarre long-distance shooting gallery, and was promptly blown to bits by X-Ray 2. Everyone had something to contribute. A couple of minutes passed, and still no tanks. "*Engaging enemy infantry,*" I heard X-Ray 3 call over the radio. A shower of rockets off to my left, and the infantry squad was packed

neatly into a brand new foxhole. It wouldn't be long now.

The next couple of minutes seemed like an hour. I armed my Helstreaks and prepared for the worst. By now I realized that the amount of fuel left in my tanks wouldn't be enough to get me back to base. As it turned out, it would take a lot more than a full tank of gas to get my chopper home. At 17:33, we found our T-72s.

The mech group consisted of two BMPs, a Zsu-23(4), and three T-72s. We attacked from the rear and, as we did, the BMPs turned to engage us. I launched a Helstreak from 2.6 klicks and it quickly homed in on the first BMP. Again I began taking hits. Yellow blips representing missiles were hopping across the threat display into the middle, and all at once my warning indicators were lighting up and beeping and basically just screaming at me for being such an idiot.

I activated my jammers and started tossing out flares and chaff like it was the Fourth of July. Bang! The chopper spun around as a SAM slammed into the tail boom. I squeezed off a couple more Helstreaks. Bang! My starboard engine was out. I disengaged the rotor and tried to stabilize the helicopter, but it was like trying to steer a leaf through a stiff October breeze. I was going in.

On the way down I could hear the Zoo, still rat-tat-tatting at me. If I survived the autorotation I swore I'd get out of the chopper, find the son of a bitch that was shooting at me, and kill him with my bare hands. I wouldn't have to. X-Ray 3 eliminated the Zoo before I ever hit the ground. The last thing I remember was the CP/G's voice over the radio . . . *"Got primary!"*

X-Ray 2 and X-Ray 3 finished off the T-72s and had to head back to base without me. A rescue chopper was sent for me. As I sat beside my mangled Comanche, I thought about how X-Ray 3 had twice come to my rescue during the mission. I decided that if there were any promotions to be given out when I got back to base, one for X-Ray 3 was definitely overdue.

DEEP STRIKE

Deep strikes are like any other type of point attack mission, except that your base is located somewhere off the map. Consequently, you begin a deep strike mission already in the air and on autopilot. To end the mission, you must leave the map at the same place where you began.

This deep strike mission took place on the outskirts of the urban area in Central Europe. However, we never flew into the city. Both objectives, as well as our FARP, were located on the undeveloped east side of the map. Even though we never got to fly down Main Street, the sheer number of defenders standing watch over the outlying areas made this one of the most challenging missions I've ever flown.

As you'll see, even though on the whole the mission was a success (both objectives were achieved and all helicopters except one returned to base), this was a pretty dismal mission for me. Nevertheless, it showed what can be accomplished through teamwork and persistence.

MISSION ORDERS

OPS NUMBER: QZT367

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 0200 Hours

CALL SIGN: Charlie

PRIMARY MISSION: Pass through South 06 to 10 and proceed to 14/03 and Engage & Destroy BMP-2 Mech Group

SECONDARY MISSION: Transport & Drop Cargo at 13/07

BASE: 08/01

FARP: 14/10

S-2

This is a night mission. The wind is from 331 degrees (NNW) at 21 knots. The visibility is good. The temperature is 61° F.

Enemy forces are expected to be on full alert throughout the area. Towed gun, infantry, BMP-2, and 2S6 units have been reported.

Enemy air activity is extremely heavy. Mi-24 Hind units have been reported.

Because of the hilly nature of the terrain, I decided that a Kiowa warrior would be a good choice. I armed my Kiowa with nineteen M247s and nineteen M261 Hydra 70 rockets.

Figure 3.13 Heading out in my Kiowa



Charlie 2 and 3 were both flying SuperCobras, armed with eight TOW-2 missiles and twenty-eight Hydra 70s each. Charlie 2 took M261s, and Charlie 3 brought along M255s. Any infantry units encountered by the heavy section would belong to Charlie 3.

The light section, Lima 4 and 5, consisted of another Cobra, armed identically to Charlie 3's, and a Black Hawk with eight Hellfires and thirty-eight M261 Hydra 70 rockets. Lima 5 also carried the cargo that had to be dropped at 13/07. Despite the impressive selection of ordnance that Lima 5 carried with him, I felt we would all have to work together to ensure Lima 5's safe arrival at the drop point. Ironically, it was Lima 5 who got the first kill.

As we crossed onto the map, I plotted a course that would take both sections to the east, where the primary objective, a BMP-1 mech group, would be waiting. Once most of the defenders in the immediate area were eliminated, I could send Lima 4 and 5 northward toward the drop point.

The hills provided excellent cover for us as we flew toward the primary. I stayed low—around 108 feet—and occasionally did a 360 with the mast-mounted sight to see if I could pick up any defenders. When I reached the first waypoint, which was about half the distance to the mech group, I pulled up behind a hill and flipped on the auto-hover.

I climbed up to over 400 feet while scanning in all directions for targets. Finally I spotted an Mi-24 Hind just sort of hanging out in a clearing. Unfortunately, he was over 4 klicks away and I had nothing I could reach him with. Since none of us were carrying any air-to-air missiles, I decided we would try to work around the Hind. I vectored everyone to another hill that was even closer to the Hind, but further north and closer to the primary.

As we dashed toward the second hill, Lima 5 spotted an SA-13 out to the northeast. I practically held my breath as the message *"Engaging enemy SA-13"* came over the radio

from Lima 5. The target was destroyed, but not before launching a SAM that would eventually home in on the Black Hawk. Lima 5 suffered damage to his avionics system; already the secondary mission was in jeopardy.

Just seconds later, Charlie 3 had a similar exchange of missiles with a BMP-2. The BMP was destroyed, but just 3 seconds later one of its SAMs slammed into the Cobra's tail boom, damaging its avionics system. A half minute later, we were all pulling up to the second hill.

This one was on the opposite side of a small range from the primary. From here it would be a short hop to a third hill, which was directly west of the mech group itself. The main problem with our present position was that we were



Figure 3.14 Charlie 2 taking off

now in a direct line of sight to the north of that Hind, which was still hovering around waiting for us to show up.

When I activated my mast-mounted sight and began gaining altitude to search for possible targets, the Hind spotted me and began firing SAMs. The first glanced off the side of the Kiowa, but without causing any damage. Not having any air-to-air ordnance on board, I activated my jammers and lowered the collective fast to get back down near the deck. A second missile caught me real good on the starboard weapons wing and spun me around, and in a flash my M247s were gone.

I finally got down out of the Hind's view and punched up the GPS map. I vectored Charlie 2 out toward the northeast, toward a towed gun that was frantically trying to get a good shot at us, and sent Charlie 3 south after that Hind. I figured that even without AAMs, Charlie 3 would be able to take down the Hind, either with M255s, or with his cannon.

Charlie 2 had no problem with the towed gun, but a pair of 2S6s in the vicinity took deadly aim at the SuperCobra. Charlie 2 went in as the result of two consecutive hits to his port engine. Before crashing, however, he managed to blow away both of the 2S6s and, in doing so, helped to clear the way for our advance on the primary.

Meanwhile, the light section, though still close by, was busy tangling with an SA-6 to the east of my position. In the process, Lima 5 took a SAM in the tail that not only messed up his tail rotor but also finished the job of destroying his avionics system. I realized that if the cargo drop was ever to take place, I had to get the light section up to the drop point while Lima 5 still had a chopper. I called up the map and sent them straight to the secondary.

I felt kind of helpless sitting there behind a hill giving orders, but until Charlie 3 dealt with the Hind, I was essentially pinned down. Finally, at 12:45, Charlie 3 took out the Hind with M255 rockets, and I made a break for the primary.



Figure 3.15 Charlie 3 saving my butt (again!)

I ordered Charlie 3 to regroup; I figured that between the M261s I had left on my port weapons wing and Charlie 3's remaining TOW-2 missiles, we'd be able to take on the mech group with no problems. Unfortunately, things got a lot worse before they got better.

Charlie 3 got tangled up with a towed gun on his way to regroup with me. Consequently, I arrived at the primary just ahead of Charlie 3 and decided to take a little peek myself. *"Incoming front!"* Now my port weapons wing was somewhere down on the ground with the other one. I must remember to talk to someone about getting a chain gun installed on my Kiowa.

Almost simultaneously, the light section ran into a little problem of their own. A BMP-2 on a hillside managed to get a piece of Lima 5's main rotor before Lima 4 knocked him off the hill. I thought, If Lima 5 makes it to the drop point and back with two mangled rotors, he's a much better pilot than I'll ever be.

So there I was, again helplessly cowering behind some stupid mountain and waiting for Charlie 3 to come and bail me out. But it didn't look good. As Charlie 3 neared the primary objective, an infantry squad started hurling SAMs at him. Charlie 3 ultimately emerged from the encounter victorious, but within 15 seconds, he took hits to his

chopper's starboard weapons wing, his cannon, and his avionics system.

Well, at this point I was just about ready to pack it in and call the whole thing off. I was almost positive that if I sent Charlie 3 in to attack the mech group alone, I'd be the only one flying out of there. Before I called him off, however, the battle was joined.

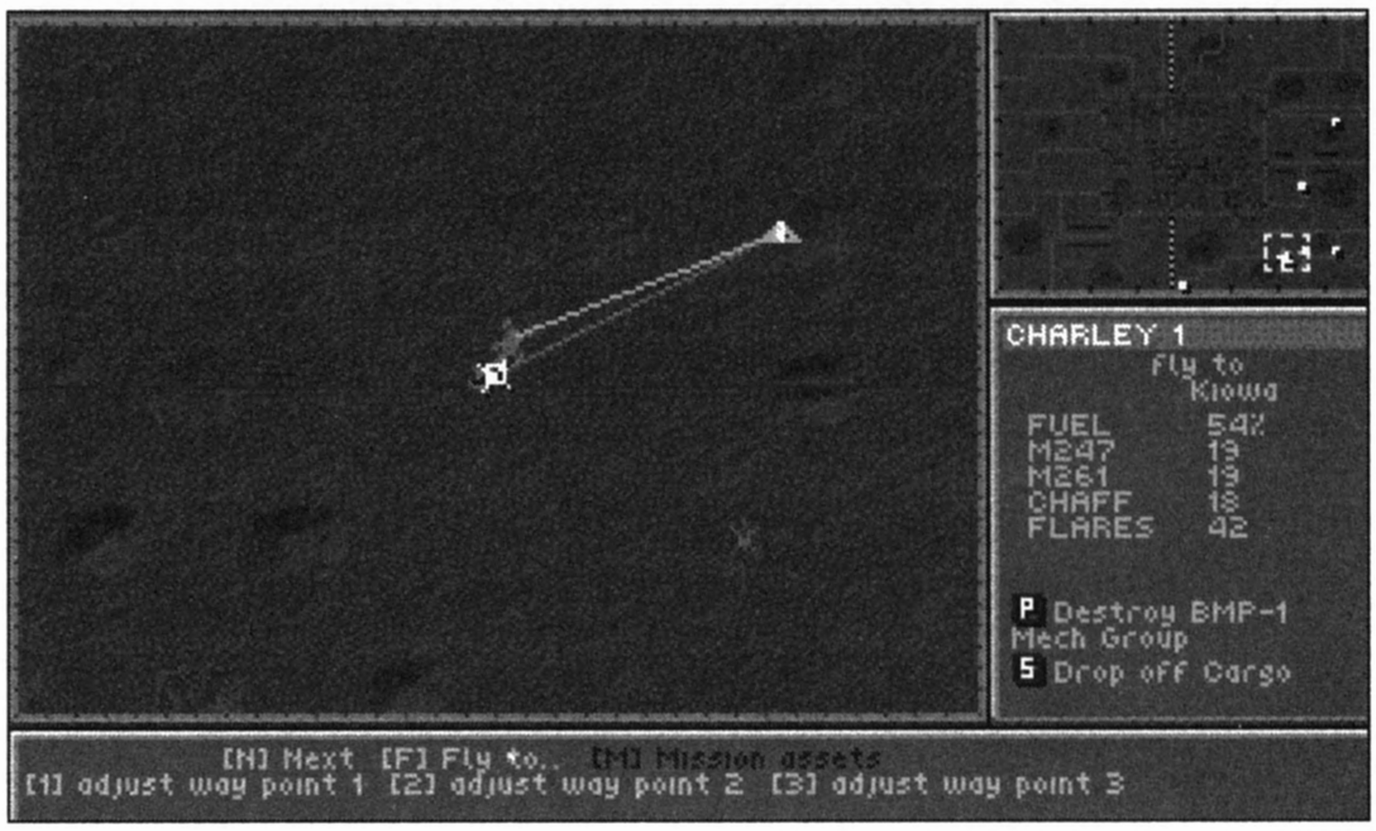


Figure 3.16 Heading home

As Charlie 3 maneuvered into position, part of the primary, a T-72, shot out his cannon with a lucky burst of machine-gun fire. Charlie 3 launched a TOW-2 missile at the tank and a few seconds later it exploded. Six seconds later, another launch. Another T-72 burst into flames. Charlie 3 took aim a third time. A third violent explosion as a BMP-1 disintegrated.

"Got primary." Unbelievable.

I spun my wingless Kiowa around and ordered Charlie 3 to regroup. We would simply follow the trail of black X's on the GPS map like a trail of bread crumbs leading us out of the forest. Then another bit of good news.

"Objective sighted . . . I've reached destination."

Lima 4 and 5 had actually made it all the way to the drop point. I ordered them to land immediately, then plotted a course to get them back to civilization. Not only did Lima 5



Figure 3.17 Black Hawks in tactical support training

come through for me by getting to the secondary in one piece, he even dusted off an infantry squad on the way home.

TACTICAL SUPPORT/SEARCH AND RESCUE

This was kind of an unusual mission for me. It was my first tour in the Philippines and I had no idea what to expect. The entire mission took 25 minutes and 44 seconds, both the primary and secondary missions were successfully completed, and I was awarded an Air Medal for Valor upon the mission's completion. What made this one so strange, however, is that I went through almost the entire mission without firing a shot!

MISSION ORDERS

OPS NUMBER: MFP897

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 2200 Hours

CALL SIGN: Bravo

PRIMARY MISSION: Proceed to 13/13 and Extract Troops

SECONDARY MISSION: Locate & Extract Troops in the vicinity of 06/02

BASE: 14/04

S-2

This is a night mission. The wind is from 246 degrees (WSW) at 12 knots. The visibility is good. The temperature is 67° F.

Enemy forces are expected to be on full alert throughout the area. Infantry, towed gun, SAM team, and FMC units have been sighted.

Enemy air activity is expected to be heavy. S-76 units have been reported.

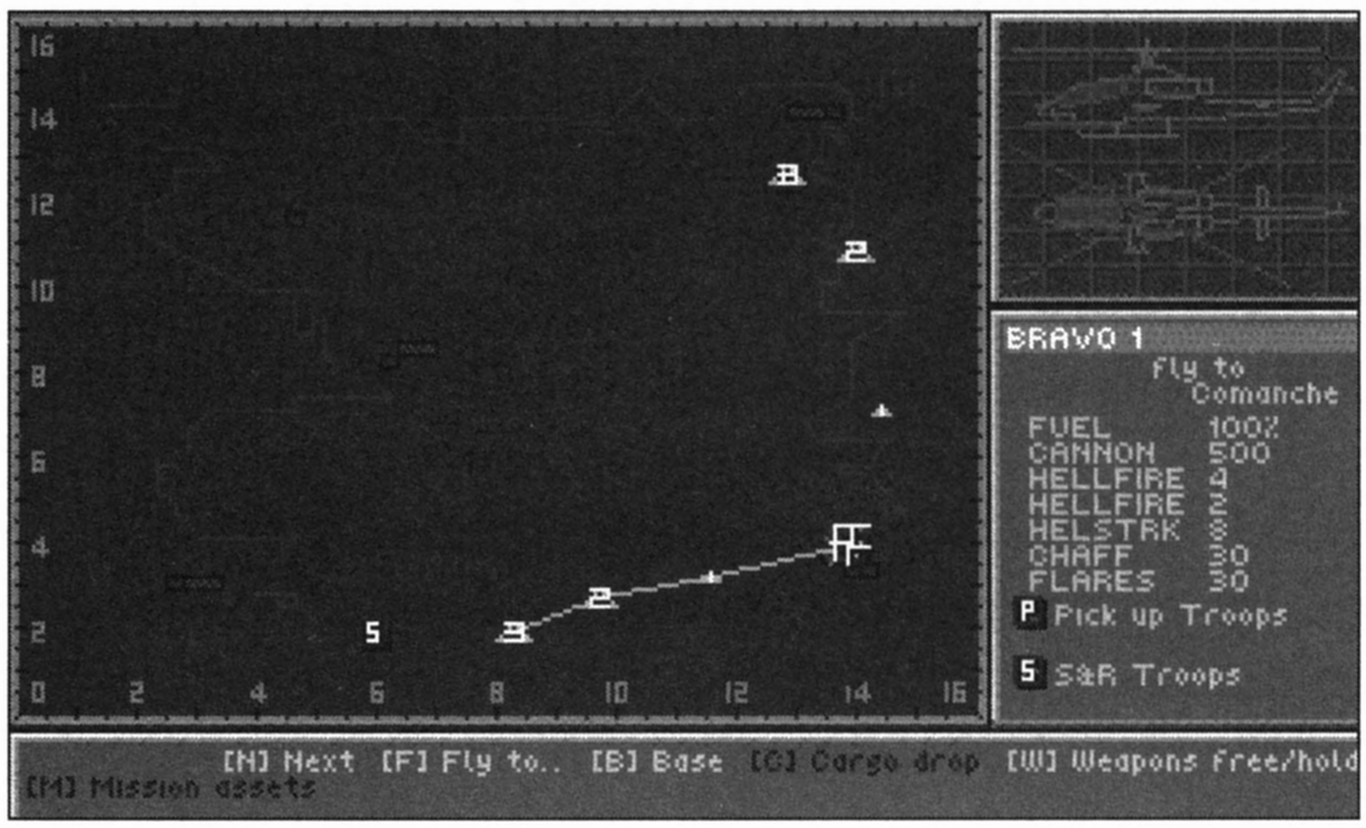


Figure 3.18 My first tour in the Philippines

Hindsight is always 20/20. When I look back on this mission, I can see that, instead of a Comanche Gunship, I should have taken a Defender and really boosted my score. My Comanche was armed with six Hellfires—four on the inboard stores and two on the outboard stores—and eight Helstreaks. Bravo 2 and Bravo 3 were both flying Black Hawks that were loaded to the max with rockets. Bravo 2 carried seventy-six M261s, and seventy-six M247s; Bravo 3 had seventy-six M255s and seventy-six M247s. They had over 300 Hydra 70s between them!

The light section consisted of Papa 4, another Comanche Gunship; and Papa 5, a Black Hawk. The Comanche was armed with six Hellfire missiles and thirty-eight M261 rockets, and Papa 5 was armed identically to Bravo 2.

We left the base just after 10 o'clock and headed out over the dark jungle. I took the heavy section and flew north toward the primary, and Papa 4 took off toward the west with Papa 5 close behind. Even though it would be difficult to locate the secondary in the dark tropical forest of the Philippines, I was confident that the light section would be able to get the job done.

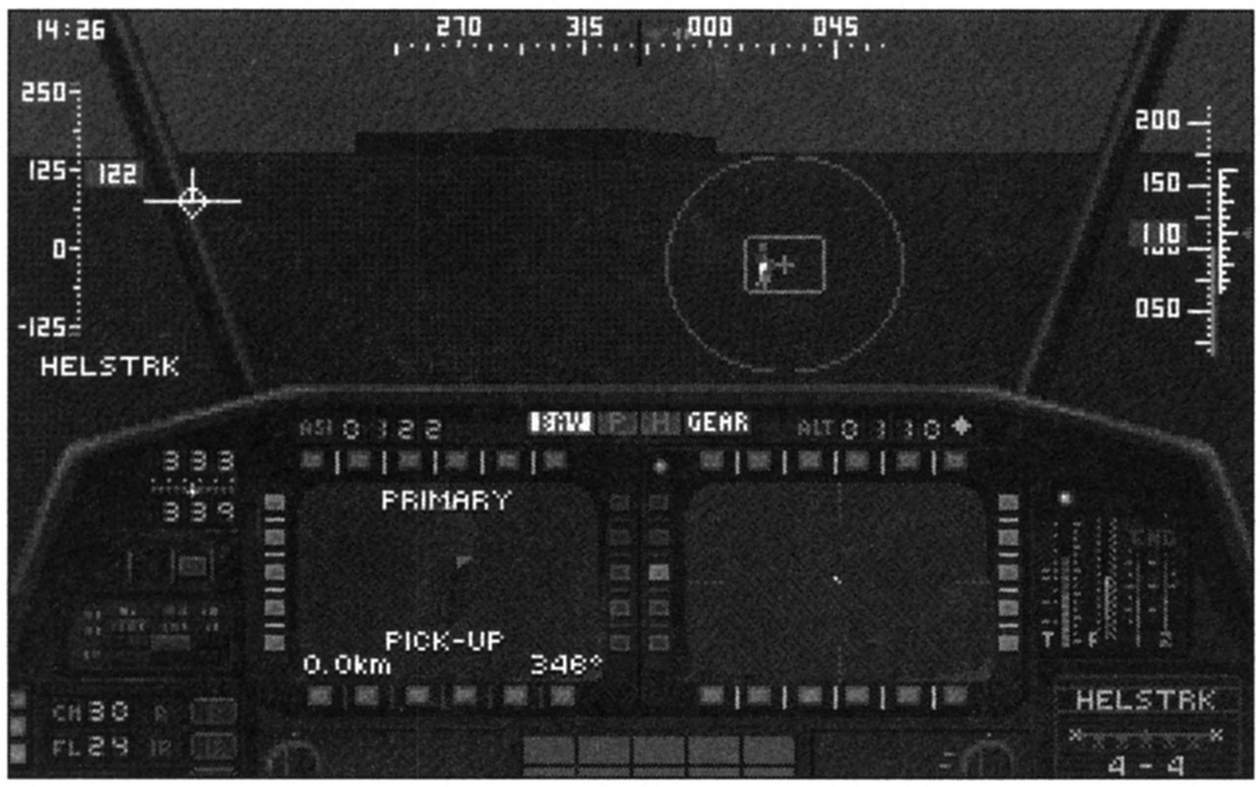
We flew low in a clearing to the east of the densest jungle. Several minutes passed before either section saw anything of interest. Then, at just over 6 minutes into the mission, I spotted an infantry squad at less than 2 klicks as we rounded a cluster of trees. I activated my IR jammer and directed Bravo 3 toward the target. Almost instantly, a pair of M255s flashed by my chopper and raced toward the infantry squad with great accuracy. Two bright flashes, an almost imperceptible delay, and then the noise of the explosions. Nice shot, Bravo 3. We moved on.

On this particular night, it seemed as if infantry units were all over the island. Just 2 minutes after our encounter, Papa 4 came over the radio: "*Engaging enemy infantry.*" From several kilometers away we could hear Hellfires exploding in the jungle like distant thunder. I checked the map and a black X marked the spot where Papa 4's infantry squad had been.

The next enemy unit to pop out of the trees in our neck of the woods was a SAM team. Again, Bravo 3 did the honors using M255 rockets. It was almost 10 minutes into the mission, and this guy was on a roll. I still had a Comanche full of heavy artillery, but I decided that as long as Bravo 3 had the hot hand, I'd let him keep blasting away.

As we neared the location of the primary objective, there was an area of dense jungle that had to be crossed to get to the pickup point. The top of the tree line is a full 312 feet above the ground and, at times, crossing over the top from one open area to another can be a dangerous proposition. Luckily, just a single infantry squad was waiting for us on the other side and—you guessed it—Bravo 3 took care of them as if he were on automatic. In the process, he took a SAM in the nose that damaged his chopper's optics system. It didn't matter. This was the last enemy target the heavy section would see during the entire mission!

Figure 3.19 Pick up spotted (top); target view of rescue (bottom)



We continued toward the pickup point for a few more minutes as Papa 4 and Papa 5 scouted the southern part of the island for their pickup. What they found instead was a V-150 Commando.

"*Engaging enemy V-150,*" Papa 4 announced. But because the Commando is an armored personnel carrier with no onboard SAMs (just a 25mm chain gun), the engagement was over quickly. While still out of the Commando's range, Papa 4 launched a single Hellfire to kill the APC.

While Papa 4 was busy making the southern half of the island safe for democracy, I

spotted our pickup just ahead in a small clearing. I scanned for other targets, but the area appeared to be empty except for this one trooper, who was standing out in the middle of nowhere waving his arm back and forth to get our attention. I directed Bravo 2 and Bravo 3 to the pickup while I circled around, looking for anything resembling the enemy. The troops climbed aboard the Black Hawks, and we swung around and headed back toward the south.

With the primary mission completed, I turned my attention back to the light section. Because of the rugged terrain in the south, Papa 4 and Papa 5 were taking a long time to reach the area where they would begin the search for the troops that needed to be extracted. Just seconds after my section completed the primary mission, the light section was ambushed by an enemy chopper.

The enemy helicopter was a Stinger-equipped S-76 Eagle. Before they could put it out of commission, both Papa 4 and Papa 5 had taken damage. Papa 5 suffered damage to the starboard engine, but the more serious damage was done to the fuel tank of Papa 4. Since the pair carried no missiles or rockets that could be used effectively against enemy air threats, they had to wait until they were close enough to the Eagle to clip its wings using their cannons.

With the secondary still nowhere in sight and a lot of distance yet to be covered, the success of the search & rescue operation was in doubt. I considered for a moment ordering Papa 4 immediately back to base while Papa 5 continued the search on his own. However, to do so would have jeopardized the safety of both units. I decided to let them continue the search together for a while longer.

After a while, it began to look as if the reason things had gone so well in the north was that every defender on the island had placed itself between our base and the secondary. But even with a fuel leak, Papa 4 was up to the challenge. After downing the S-76, Papa 4 went on to destroy another infantry squad, an FMC, an enemy M113, and another FMC, in that order, and all in the span of less than 2 minutes!

Although Papa 4 blasted his way through this jungle

shooting gallery without taking another hit, it did cost in time and, more important, in fuel. If the secondary didn't turn up soon, I would have to call the boys home and leave those troops stranded until we could get another flight up.

Then, at just after the 22-minute mark, the light section had the good fortune to be attacked by an enemy towed gun. Now, I realize that such an attack isn't normally cause for celebration, but as Papa 4 circled around to the north to engage the towed gun, he happened to discover the pickup about a klick to the northeast of the defender.

"Objective sighted."

As Papa 4 was finishing off the towed gun, I sent Papa 5 in to pick up the troops. With 11 tired but happy troops on board, the light section began the journey back to the base.

By this time, my section was getting close to home and I still hadn't fired a single missile. I climbed to over 300 feet and looked around, but there was really nothing to shoot at. Finally, as we got to within 5 or 6 klicks of the base, I targeted a couple of buildings off in the distance. Now, in all likelihood these buildings posed no threat to the section. After all, they had been there when we took off and hadn't fired at us. However, you never know when someone's going to open a window and pump off a few SAMs from a portable launcher. I leveled both buildings with Hellfires.

Meanwhile, Papa 4's fuel was low, and the light section still had several klicks to go before they'd be home. I decided I would monitor their progress carefully and, when Papa 4's fuel supply got down to 2 percent, I would find him a nice place to land.

When the fuel tank of Papa 4's Comanche got down to just 6 percent full, he announced, *"Fuel is critical!"* The light section was still over the river at the time, but on their present course, they would be over land again in just a few minutes. I would let him keep flying for just a little longer.

With maybe just 7 or 8 km left to reach the base, Papa 4 had expended all but 2 percent of his fuel supply. I decided it was time to put the Comanche on the ground, so I

instructed Papa 4 to land. Immediately upon landing, Papa 4 got on the radio and made an S.O.S. call. Luckily, Papa 5 had room for one more aboard the Black Hawk, so I instructed him to swing around and pick up Papa 4, who was waiting patiently outside the grounded Comanche. Within a few minutes, four helicopters, five pilots, and 22 grateful troops landed back at the base.

RECON

It was like some bad dream. I kept asking myself what I could have been thinking when I volunteered for duty in Antarctica. Nothing for hundreds of miles but ice, penguins, blinding snowdrifts, other lunatics with SAMs who wanted to kill me, bizarre fields of magnetic interference, and more ice. This place made Central Europe look like a vacation resort.

Now they wanted me to fly several miles into the twilight looking for God knows what. They call it recon, but when the temperature is only 12° F and the prospect is very real that I'll end up down on the ice with broken bones waiting for some CW2 in a Black Hawk to find me among the snowdrifts, I call it insanity.

MISSION ORDERS

OPS NUMBER: VVK370

TO: Lieutenant Colonel Guerra

FROM: TF Commander

TIME: 2200 Hours

CALL SIGN: Alpha

PRIMARY MISSION: Proceed to 05/11 and observe & report all enemy forces found in the immediate area

SECONDARY MISSION: Intercept Kurassier Platoon moving NE from 05/07 and Engage & Destroy

BASE: 12/08

S-2

This is a dusk mission. The wind is from 227 degrees (SW) at 12 knots. Visibility is limited. The temperature is 12° F.

Enemy forces are expected to be on full alert throughout the area. Infantry, towed gun, M113, and Arctic Cat units have been sighted.

Enemy air activity is expected to be heavy. A-109 units have been reported.

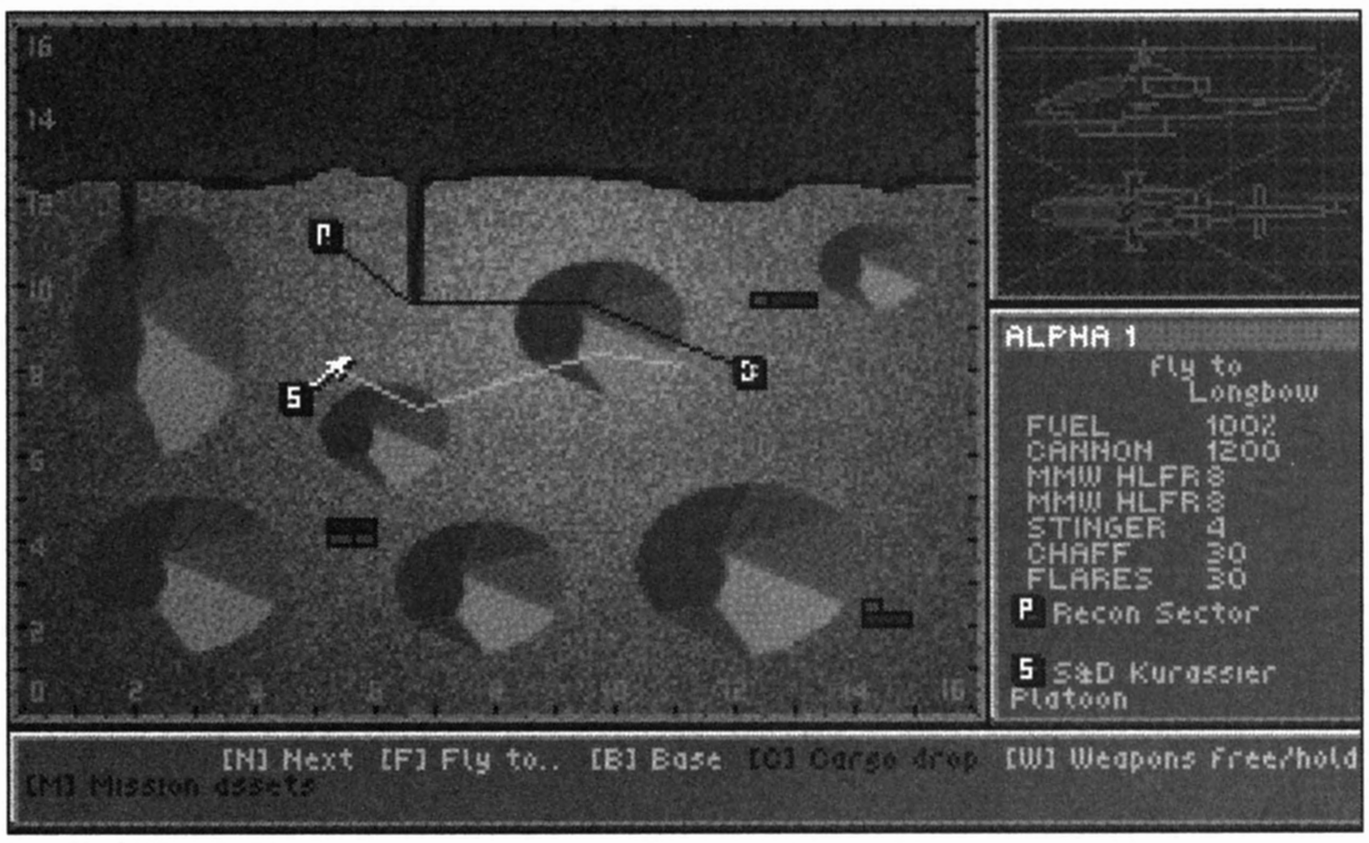


Figure 3.20 Antarctica

You might say I was in kind of a bad mood when I got to the armorer's tent. I ordered my favorite chopper of mass destruction, the Longbow Apache, complete with sixteen MMW Hellfires and four Stinger AAMs. I felt generous, so I got an identical model for X-Ray 4 while I was at it.

Everyone else got Kiowas. Alpha 2 and X-Ray 5 were each armed with nineteen M255s and seven M261s; Alpha 3 brought along a pair of Hellfires and a GPU-2/A minigun pod. I decided I would send the light section out after the Kurassiers, and take the boys in the heavy section out to 05/11 for a little sightseeing tour. Unfortunately, these recon missions always seem to involve a lot more fighting than observing or reporting.

The secondary objective was only 7 sectors west of the base, and the primary was just 4 sectors north of the

secondary. NOE flight through the area could be treacherous because of the jagged cliffs of ice that dotted the landscape and the unevenness of the deck. This, combined with the occasional snowstorms and areas of magnetic interference, made navigation in Antarctica tougher than in any other theater.



Figure 3.21 Alpha 2 and 3 fall into formation

Our compasses first started going haywire just a minute and a half after leaving the base. Even though I knew I was maintaining a fairly steady course, I still felt uneasy without confirmation from the gauges. To see the helicopter spinning uncontrollably on the MFD was also somewhat disconcerting, but I stayed my course, and after about 30 seconds the interference stopped and my gauges returned to normal. I had drifted slightly off course, but after a minor correction we were back on track.

After a few minutes of relatively clear sailing, we encountered another disorienting enemy—the weather. The snow started out light, but as we flew further west the blowing snow and ice made flying nearly impossible. As I flew low through a narrow gorge, I held my breath, hoping not to catch my main rotor on some unseen dagger of ice protruding from the cliffs. Alpha 2 and 3 fell into formation behind me, and luckily everyone passed through safely.

More time passed; there was more magnetic interference,

and more snow squalls, to contend with. At times I just stared out into the deep purple sky of the Antarctic dusk and the powder-blue ice below, and thought about how beautiful the place was—despite the 12-degree temperature.

"Engaging enemy SAM team." X-Ray 5's voice, crackling over the radio, brought me back to reality. I could see the red blip at about 10 o'clock on the threat display. Then I heard the explosion of M255 rockets come echoing over the ice from the south, and the blip quickly faded from view.



Figure 3.22 Enemy SAM team at 10 O'clock

A minute later, two more blips showed up. This time they were dead ahead. On the HUD, a target box framed an infantry squad that was just under 3 km out ahead of us. *"Incoming front!"* I immediately flipped on the IR jammer and fired a Hellfire-B at the infantry squad. I pressed the button to acquire the next target. This time an enemy M113 lit up the MFD. I squeezed off another MMW Hellfire and began to maneuver away from the oncoming SAM. As I turned away from the targets, I felt the missile's impact against the Longbow's armor. I looked down at the system status lights. All green.

While I was busy melting the ice with Hellfires, X-Ray 4 had located the secondary and was single handedly wiping that Kurassier platoon off the map. Sixteen MMW Hellfires spent on three lousy tanks. Talk about overkill! When the

last Kurassier lit up the sky, I vectored the light section toward my position. If we got into trouble, maybe X-Ray 5 could do an end run to reach the sector that had to be reconned.

Unfortunately, trouble came a little sooner than expected. As soon as I'd issued the new waypoints to the light section, I was surprised by an EE-11 that appeared out of nowhere as I pulled the chopper around a huge ice formation. Someone down there had a sharp eye and a quick trigger finger. Before I had a chance to arm my chain gun and blast the APC, a stray round from its 12.7mm machine gun ripped into my fuel tank.

Maybe I should have laid back a little and let the Kiowas take the lead for a while, but I figured that as long as I had the MMW Hellfires, I should blaze the trail. The next defender in our way was an Arctic Cat. He managed to hit the chopper with a few rounds from his 7.62mm machine gun, but again I lucked out. No damage. I returned fire with my 30mm and littered the ice with dead cat.

For some reason, every defender I came across was getting a piece of me—and with MGs! At about 10 minutes into the mission we were closing on the sector where the Kiowas would do their observing when an AMX VTP (that's French for APC) opened up on me. I eliminated the AMX, but not before taking a hit to my port engine.

In a matter of seconds at least five red blips lit up on the threat display and every warning indicator in the cockpit started flashing and beeping. I rearmed my Hellfires and started firing. As soon as I launched one, I'd find myself another target and launch another. I wasn't exactly being selective about the recipients.

First a towed gun exploded in front of me. Four seconds later another Arctic Cat lost Life Number Nine. Less than 10 seconds after that, one of my missiles found a Crotale mobile SAM launcher. During the action I was taking my share of hits. When I looked down at the status display it showed damage to my optics system and cannon, and indicated that the loud BANG! I'd heard out on the right side of the

Longbow was my starboard weapons wing getting blown off.

Having cleared the way (and taken most of the punishment for it), I decided it was time to send the Kiowa Warriors on ahead to do their thing. I could see the primary, an infantry squad, in the distance and knew Alpha 2 and 3 would soon be within range to recon the sector.

By the time the light section caught up with us, the primary was already achieved, but there were still a few defenders left in the area that had to be dealt with. Before we made it back to the base, X-Ray 4 took out another AMX and a Snow Cat. I spent a Stinger on an MD-530 (probably some poor sap sent out to do recon for the other side), and, despite my fuel leak, made it back to base with a few gallons to spare.

CAMPAIGNS

Although tackling *Gunship 2000* missions one at a time can certainly be challenging, battling your way through a tough campaign is the ultimate challenge. In the campaign game you'll have to complete not one, but a series of missions which, taken together, will help to determine the outcome of the war. You may not successfully complete every single mission in the campaign, but a good winning average is usually enough to put your side over the top.

When you show up for your first briefing of the campaign, you'll probably notice that the map the S-2 is pointing at is divided down the middle. The left side of the map is blue; the right side is red. The object of the campaign game is to push the blue across the whole map. Each time you achieve your primary and/or secondary objective, the blue area expands a little further to the right.

One thing you should be aware of before you enter a campaign is that, during a war, specific helicopters and ordnance can often be in short supply. Don't be surprised, therefore, when you show up at the armorer's tent looking for a Longbow or a Comanche, only to find that there are

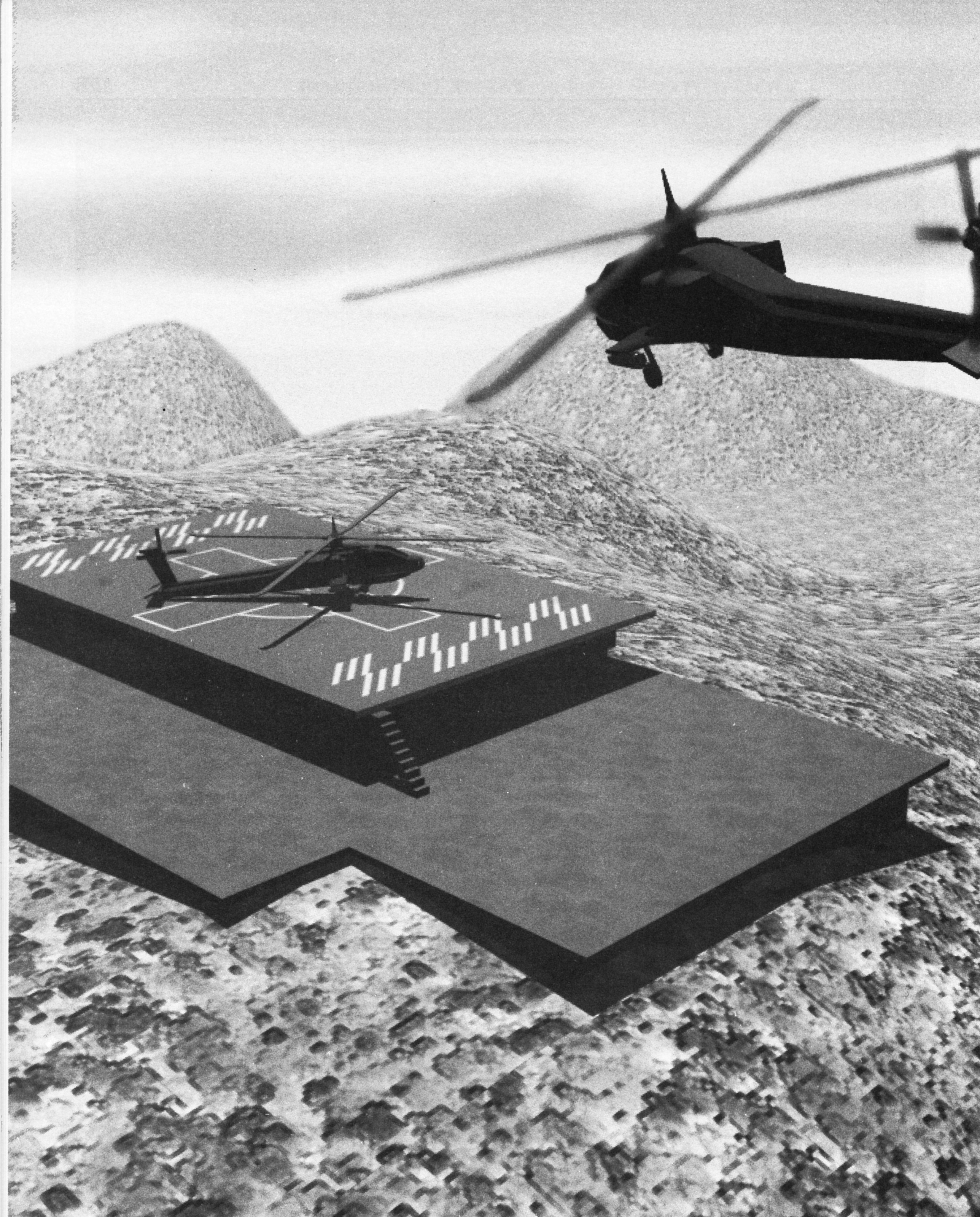


Figure 3.23 AH-1W SuperCobra

none available. "But I'm a Captain," you'll say, pointing to your stripes. Save your breath.

Then the time will come when you're pleasantly surprised to find a complete selection of helicopters just waiting for you. So you'll pick out a shiny new Longbow and be all excited—until you realize MMW Hellfires are out of stock and you've got to settle for Hydra 70 rockets. That's war.

Despite all the hardship and aggravation, the tough ops, and the uncertainty of the war's outcome, successful completion of a campaign in a tough theater can do a lot to boost your military career. When you're riding down Broadway through a shower of ticker tape after the war, you'll know it was all worth it.



PART 4

Additional Information

SCORING

Whenever you complete a *Gunship 2000* mission, either successfully or unsuccessfully, you are given a score that reflects how well you did. Your overall score is determined by taking into account not only the number and types of targets you destroyed, but also the difficulty level of the mission, the type of helicopter you piloted, whether you achieved your primary and/or secondary mission, the length of time you took to complete the missions, and even the theater of duty in which you flew.

You may also receive a decoration or a promotion at the end of a successful mission. While the awarding of most decorations is based solely on your performance for that particular mission, promotions are based on your overall record as a pilot and the total number of points you've accumulated throughout your career.

Promotions can be important to your career as a *Gunship 2000* pilot because certain helicopters and mission types are issued only to pilots who have reached a specific rank. For example, you must achieve the rank of 2nd Lieutenant or above to command other choppers in a multi-helicopter flight or to use the Mission Builder, you have to reach 1st Lieutenant or higher to fly a Comanche, and you must be a Captain or better before you can take a Longbow Apache for a spin.

Because these restrictions are based on rank and rank is a function of your total score, the score you achieve on each mission can be important to your overall success in the game. Although some players never worry about the scoring system and simply try to do their best on every mission without regard to their final score, I realize there are others who want to understand every nuance of the scoring system, to know exactly what kind of score it takes to receive specific medals, and to be able to predict precisely when they will receive their next promotion. Sometimes, learning that "with continued success promotion should be forthcoming" just isn't good enough.

Gunship 2000 designer Jim Day was kind enough to share with me the scoring, promotion, and decoration criteria that are used in the game's internal calculations so that I could pass them along to you. The total points needed to gain specific promotions are as follows:

Brigadier General	28,000
Colonel	21,000
Lieutenant Colonel	15,000
Major	10,000
Captain/CW4	6,000
1st Lieutenant/CW3	3,000
2nd Lieutenant/CW2	1,000
W-01	100

It's important to understand that these numbers are simply base figures, and that other aspects of your career can act to reduce or increase these base values. For instance, some decorations you receive can reduce these requirements by amounts ranging from 1,500 (Medal of Honor) to 200 (Bronze Star for Valor). Alternatively, points will be added to these base values every time you decline a mission (300), abort a campaign in progress (500), fail to return to base (200), or fail to achieve either mission objective (200). Also note that to receive any promotion after a specific mission, you must have achieved either the primary or the secondary or both.

The single-mission scores necessary for receipt of specific decorations are listed below.

Congressional Medal of Honor	1,700
Distinguished Service Cross	1,300
Silver Star	1,000
Bronze Star for Valor	750
Air Medal for Valor	500
Army Commendation Medal	250

Again, there are a few catches. First, to receive any decoration, you have to get either the primary, the secondary, or both. For that elusive Congressional Medal of Honor, *both* the primary and secondary must be achieved, the enemies must be either Crack or Elite, and you have to get your chopper back to base. To pick up a Distinguished Service Cross, the quality of your enemies must be either Crack or Elite.

Although nobody can receive more than one CMOH during a single career, you can receive multiple decorations of other types. However, after you receive a specific medal twice, you'll be skipped over for that medal one time. With each duplicate medal you're awarded, it becomes harder to pick up the next one. The only exception to this rule is the Purple Heart—but collecting a closet full of those should be no pilot's goal.

The final score you receive for any mission is determined by first establishing a difficulty multiplier based on the theater of duty, the type of mission (Single, Flight, Campaign, and so on), the quality of enemy troops, and the setting of the cockpit reality switches. This difficulty multiplier ranges from a high of 2.5 to a low of less than 1.

Second, a raw score is arrived at by adding up the point values of all targets destroyed (see "Target Point Data," later in this section). Targets destroyed by other choppers in your flight or by air and artillery assets are counted at half their normal values. Also, points are subtracted for destroying friendly targets or losing friendly choppers.

Third, mission bonus points are added to the raw score. You get bonus points for completing the primary and secondary missions and for winning a campaign. In addition, bonus points are awarded for accepting the default helicopter or for taking specific helicopters. Comanche Scouts, Defenders, and Kiowas all carry the same bonus (50 points), followed by Comanche Gunships, Black Hawks, and SuperCobras (25 points). These points are only awarded if the chopper survives the mission, if the primary and/or the secondary are achieved, and if you go against Crack or Elite forces (half the bonus is awarded if you fly against Average forces). Fifty points are actually deducted from your score if you decide to take a Longbow Apache, whether you make it back to base or not.

Finally, the total score is multiplied by the difficulty multiplier, and the result is reduced by a time penalty if the mission takes longer than 30 minutes. The maximum time penalty (awarded after 70 minutes) is 0.5, or 50 percent, which essentially cuts your score in half. All times between 30 and 70 minutes are penalized proportionately. In other words, if you were to take 50 minutes to complete a mission—halfway between 30 and 70 minutes—you would be penalized only 25 percent of your score (half of the 50 percent maximum penalty).

Now that you understand what happens to your raw score once it's calculated, here is a summary of all target

points for Central Europe, the Persian Gulf, Antarctica, and the Philippines. Remember that once these points are totaled, they're multiplied by the difficulty multiplier.

Notice also that, with the possible exception of billboards, only targets with some military purpose are assigned points. Flying around shooting at penguins, cows, camels, water buffalo, churches, and mosques doesn't contribute militarily and, therefore, is not rewarded with points.

TARGET POINT DATA

CENTRAL EUROPE		PERSIAN GULF	
OBJECT	POINTS	OBJECT	POINTS
2S1 SO-122	10	2S1 SO-122	10
2S6	25	Air Tower	15
Air Tower	15	AML-90	10
Ammo Dump	15	Ammo Dump	15
AN-72 Land	15	AMX-30	–50
Apache	–100	Apache	–100
Arch	5	AT-5	10
AT-5	10	A-10A	–100
A-10A	–100	Billboard	10
Barge	20	Black Hawk	–100
Barn	5	BMP-1	15
Billboard	10	BMP-2	15
Black Hawk	–100	BRDM-2	10
BMP-1	15	BTR-60	15
BMP-2	15	Building	5
Boxcar	10	Bunker	30
BRDM-2	10	Camel	0

CENTRAL EUROPE		PERSIAN GULF	
OBJECT	POINTS	OBJECT	POINTS
BTR-80	15	Carrier	–500
Building	10	Challenger	–50
Building	5	Comanche	–100
Bunker	30	Crane	10
Causeway	20	Defender	–100
Church	0	Derrick	10
Coal Car	10	Drop Zone	–50
Comanche	–100	EE-11	15
Cow	0	EE-9	10
Crane	10	Escort Ship	–300
Defender	–100	Fixed Gun	15
Drop Zone	–50	Fuel Tank	5
Engine	15	F-15E	–100
Fixed Gun	15	F-16C	–100
Flat Car	10	Gazelle	25
Flat Car	20	Hangar	10
Fuel Tank	5	HQ Tent	10
F-15E	–100	Hummer	–50
F-16C	–100	Infantry	20
Hangar	10	Kiowa-D	–100
House	5	Longbow	–100
HQ Tent	10	M109	–50
Hummer	–50	M113	–50
Infantry	20	M113 Iraqi	15
Ka-34 Hokum	40	M163	–50
Kiowa-D	–100	M1A1 Abrams	–50
Longbow	–100	M2 Bradley	–50
M109	–50	M60A3	–50
M113	–50	M901	–50
M163	–50	Matka Boat	50
M1A1 Abrams	–50	Mirage F1 Air	40

CENTRAL EUROPE		PERSIAN GULF	
OBJECT	POINTS	OBJECT	POINTS
M2 Bradley	–50	Mirage F1 Land	15
M60A3	–50	MiG-23 Air	40
M901	–50	MiG-23 Land	15
MiG-23 Air	40	MiG-29 Air	50
MiG-23 Land	15	MiG-29 Land	15
MiG-29 Air	50	Mi-24 Hind	30
MiG-29 Land	15	Mi-8 Hip	25
Mi-24 Hind	30	MLRS	–50
Mi-28 Havoc	35	Mobile Scud	15
Mi-8 Hip	20	Mosque	0
MLRS	–50	Oil Rig	20
MT-LB	15	Oil Tank	10
Pick-Up	–50	OSAII Boat	50
Radar Site	20	Pick-Up	–50
Rail Bridge	20	Radar Site	20
River Boat	20	Refinery	25
Road Bridge	20	SAM Team	15
SAM Team	15	SA-13	20
SA-11	20	SA-3	15
SA-13	20	SA-6	16
SA-3	15	SA-9	20
SA-6	16	Scorpion	–50
SA-9	20	Semi Truck	10
Semi Truck	10	SuperCobra	–100
SuperCobra	–100	Supplies	5
Supplies	5	Su-25 Air	50
Su-25 Air	50	T4 Boat	25
Su-27 Air	50	Tank Truck	10
Tank Car	20	Tent	5
Tank Truck	10	Towed Gun	15
Tent	5	Tower	5

CENTRAL EUROPE

OBJECT	POINTS
Towed Gun	15
Tower	5
Trailer	10
Truck Cab	10
Truck	10
T-62	10
T-72	12
T-80	12
Zsu-23(4)	15
Zsu-57(2)	15

PERSIAN GULF

OBJECT	POINTS
Trailer	10
Truck Cab	10
Truck	10
T-55	10
T-62	10
T-72	12
Warrior	–50
Zsu-23(4)	15
Zsu-57(2)	15

ANTARCTICA

OBJECT	POINTS
AC-130 Land	15
Ammo Dump	15
Amphib. Boat	25
AMX-155	15
AMX-30	12
AMX-VTP	15
Apache	–100
Arctic Cat	15
A-109	30
A-10A	–100
A-4 Air	40
Billboard	10
Black Hawk	–100
Building	10
Bunker	30

PHILIPPINES

OBJECT	POINTS
AC-130 Land	15
Air Tower	15
Ammo Dump	15
Amphib. Boat	25
Apache	–100
A-10A	–100
Billboard	10
Black Hawk	–100
Buffalo	0
Building	5
Bunker	30
Carrier	–500
Church	0
Comanche	–100
Crane	10

ANTARCTICA

OBJECT	POINTS
Carrier	–500
Comanche	–100
Crane	10
Crotale	25
Dabur	30
Defender	–100
Derrick	10
DHC-6 Land	15
Dome	10
Drop Zone	–50
EE-11	15
EE-9	10
Escort Ship	–300
Fixed Gun	15
Freighter	70
F-15E	–100
F-16C	–100
F-27 Land	15
F-5E Air	40
Hangar	10
HQ Tent	10
Hummer	–50
Infantry	20
Kiowa-D	–100
Kurassier	10
Longbow	–100
Lurssen	40
M109	–50
M113	–50
M113 Argie	15

PHILIPPINES

OBJECT	POINTS
Defender	–100
Derrick	10
Drop Zone	–50
Escort Ship	–300
Fixed Gun	15
FMC	15
Freighter	70
F-15E	–100
F-16C	–100
F-5E Air	40
Hangar	10
HQ Tent	10
Hummer	–50
Infantry	20
Kiowa-D	–100
Longbow	–100
M109	–50
M113	–50
M113 Phil	15
M163	–50
M1A1 Abrams	–50
M2 Bradley	–50
M60A3	–50
M901	–50
MD-530	30
MLRS	–50
Oil Tank	10
OV-10 Air	30
Patrol Boat	20
PCE Boat	30

ANTARCTICA

OBJECT	POINTS
M163	–50
M1A1 Abrams	–50
M2 Bradley	–50
M60A3	–50
M901	–50
MD-530	25
Mine	15
Mine Large	30
Mirage III Air	40
MLRS	–50
Oil Tank	10
Oil Well	20
Penguin	0
Pick-Up	–50
Radar Site	20
Rapier	25
Reshev	50
Roland	25
SAM Team	15
SA-315B	20
SA-332B	30
Snow Cat	15
Submarine	70
SuperCobra	–100
TAM	10
Tank Truck	10
Tent	5
TigerCat	20
Towed Gun	15
Truck	10

PHILIPPINES

OBJECT	POINTS
Pick-Up	–50
Radar Site	20
SAM Team	15
Scorpion	10
SuperCobra	–100
Supplies	5
S-76	50
Tank Truck	10
Tent	5
Towed Gun	15
Truck	10
UH-1	30
V-150	10

ISLANDS AND ICE/MISSION BUILDER

Islands & Ice is a scenario disk/upgrade with integrated Mission Builder that adds two new theaters of duty, the Philippines and Antarctica, to *Gunship 2000*. Each of these theaters is represented by three new maps or mission areas, and one new area has been added to each of the existing theaters as well. As a result, there is now an urban area in Central Europe, and an area of rugged terrain in the Persian Gulf.

The addition of these new scenarios brings with it several new types of defenders to battle. There are more than thirty new enemy weapons and equipment types, including four new air defense missile systems, eight new ground vehicles, ten new enemy planes, six new enemy choppers, and six new naval vessels (including a Type 209 submarine).

The integrated Mission Builder that comes with this upgrade (Version 496.07) allows you to create your own missions from scratch, or to modify previous missions that have been saved as mission films. Even though the Mission Builder features an elegant, yet powerful, icon-driven interface, It will probably take you a few tries to become proficient at creating your own missions from scratch.

Essentially, a mission is created by selecting a map, choosing a mission type, selecting various types of defenders and dragging them to the map, designating your primary and secondary objectives, and placing a base somewhere on the map. Other variables, such as the time of day, the temperature, the wind direction and speed, and the level of visibility, can also be specified during mission creation. If you like, defenders in addition to those

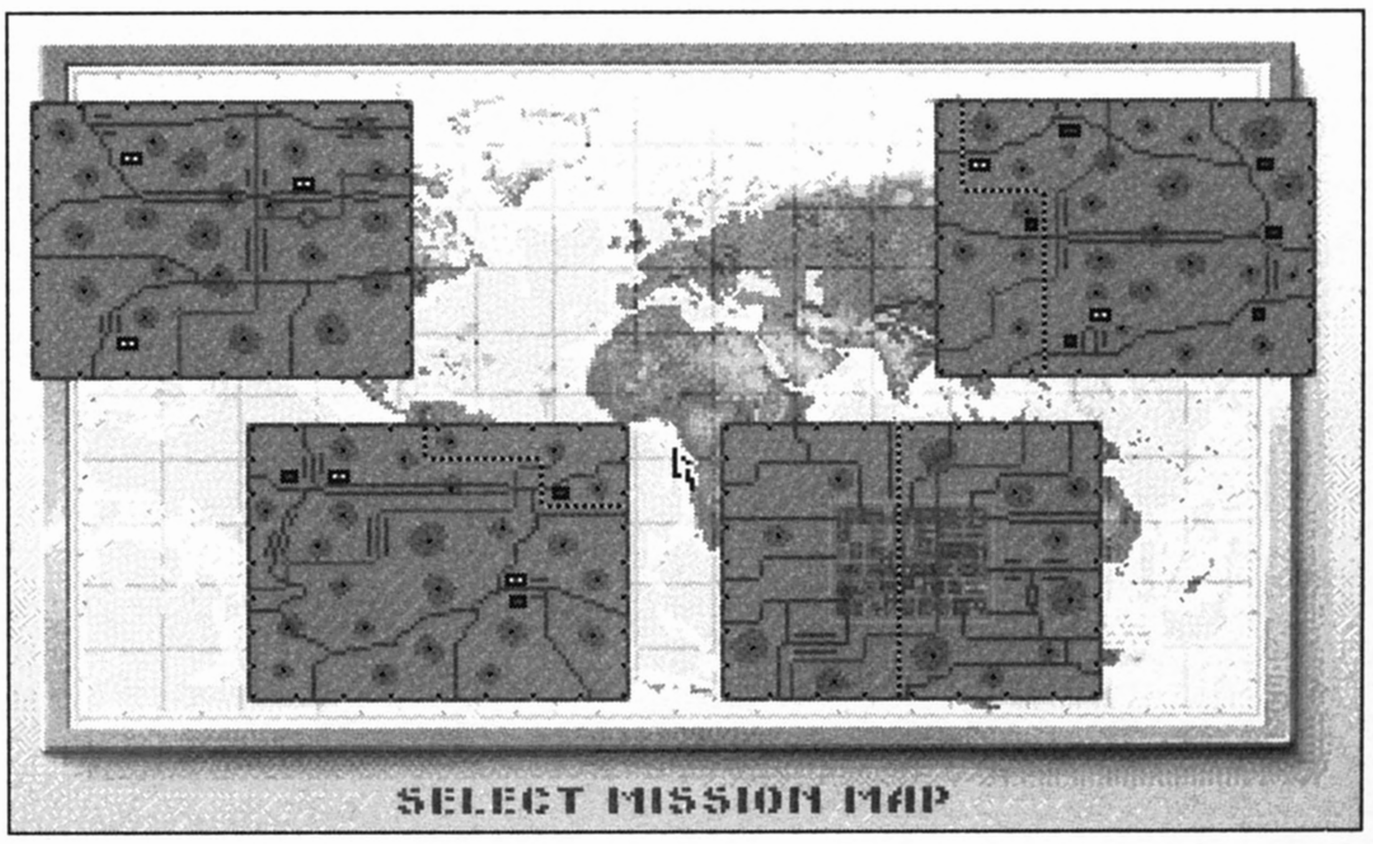


Figure 4.1 Start by selecting a mission map

you've placed manually can be automatically filled in by the computer, so there can still be some element of surprise when you fly missions you've created yourself.

The Mission Builder comes with seven pre-built contest missions that were designed by the Islands & Ice

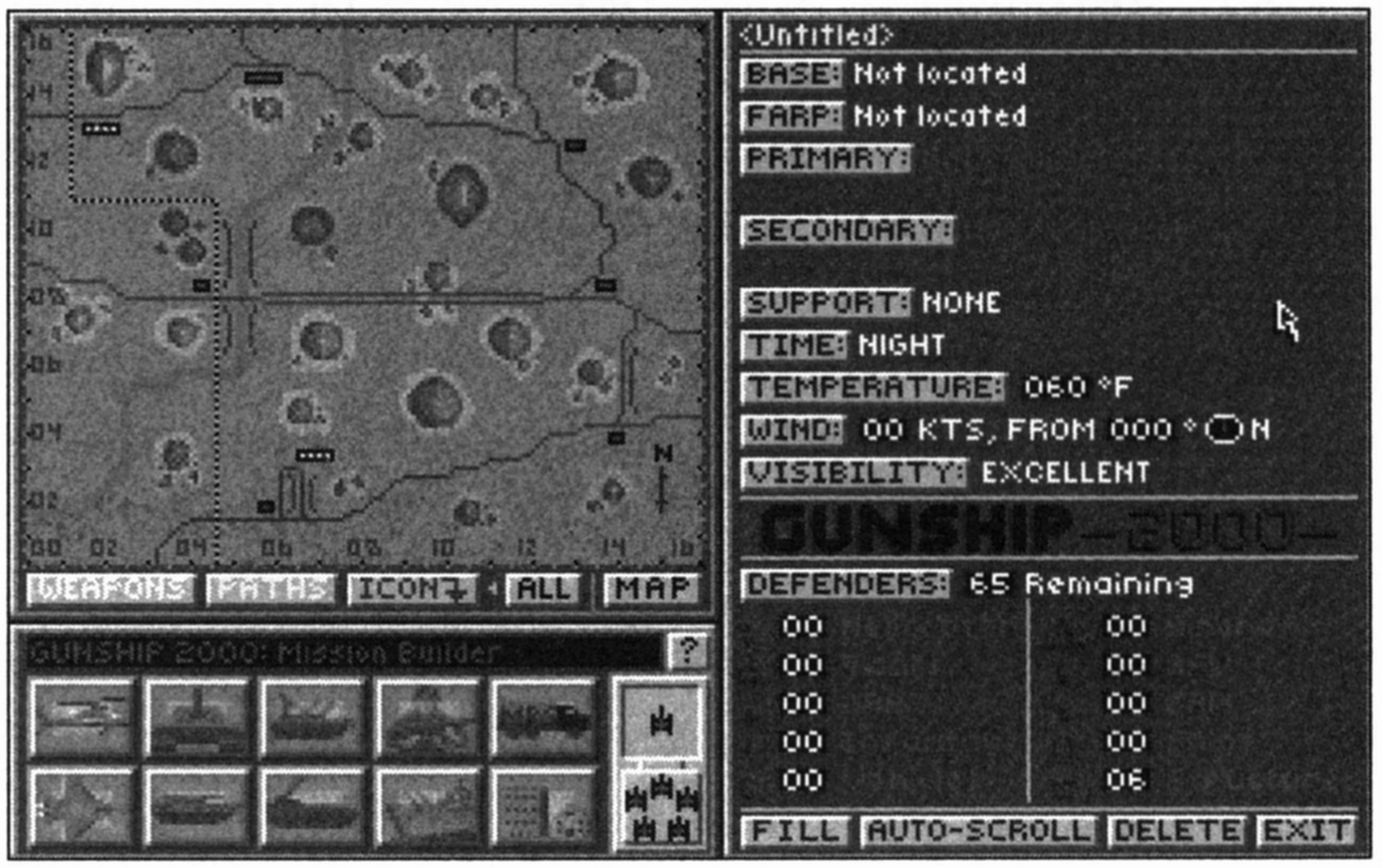
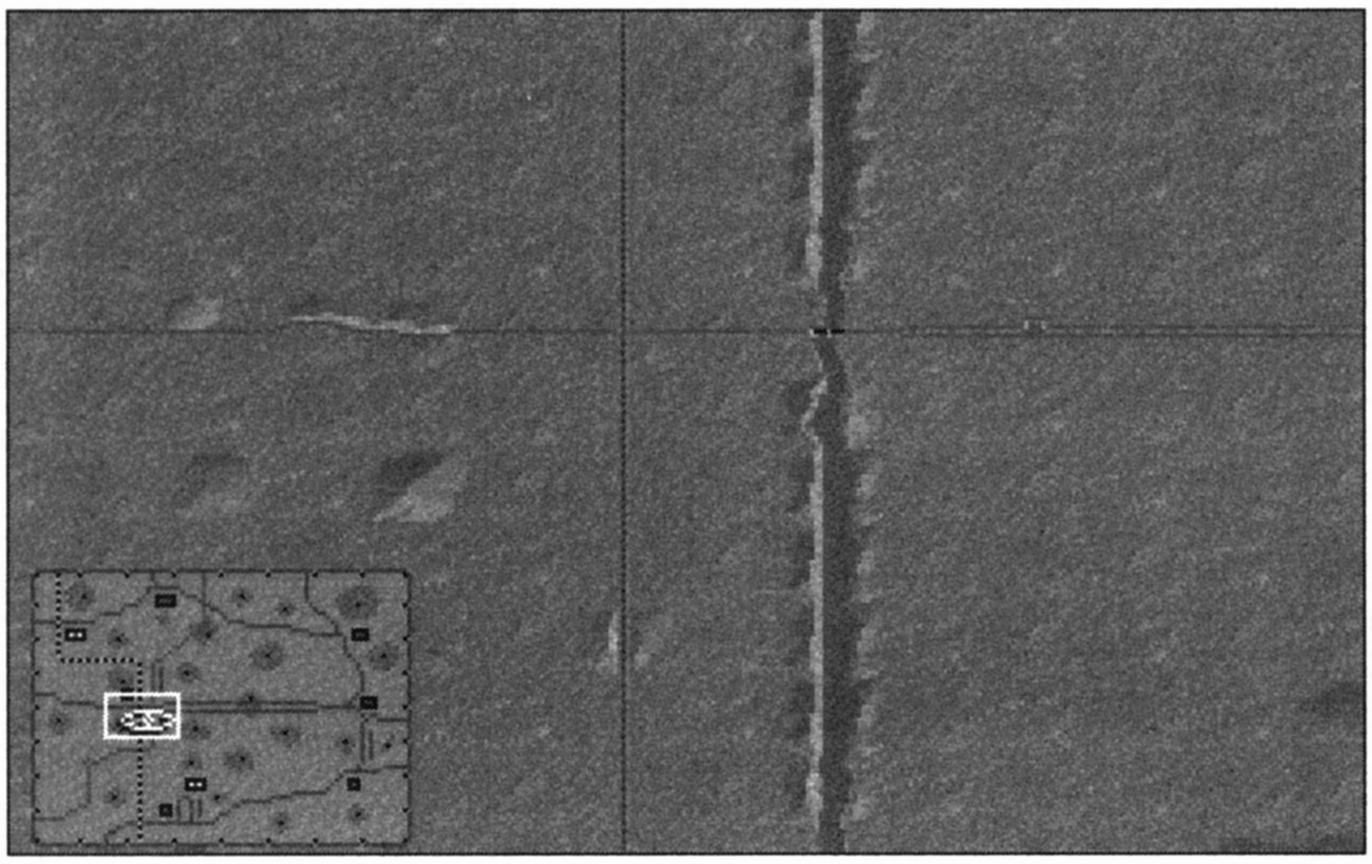


Figure 4.2 Mission Builder main screen

development team. The missions are called "Apocalypse MPS" (Chris Hewish), "Back Alley" (Don Goddard), "Battle of Khafji" (Lawrence Russell), "Frozen Grave" (Jim Day), "Line in the Snow" (Tim Train), "Rain of Terror" (Dave Osborn), and "SCUD in Your Eye" (Vaughn Thomas).

Because these are contest missions, they can't be edited in any way. Furthermore, while you can fly the contest missions as many times as you want, the mission films that you save after flying these missions can't be exported to the Mission Builder. After all, what kind of contest could you have if everyone got to see exactly where all the bad guys are?

Figure 4.3 Place defenders on the low scale map



The easiest way to actually begin designing your own missions is to edit a previously flown mission that has

been saved as a mission film. To modify a mission film, you simply select Export from the mission replay area, and the saved mission is sent over to the Mission Builder for editing.

Once you begin playing with this Export feature, you'll realize what a powerful feature it is. If you're like me, you've probably flown a mission or two that you know you could handle much better if you just had a second chance. Although you could always jump into a replay in progress and finish the mission differently, no matter how well you do on the resumed mission, you'll receive no medals or promotion, and you won't be allowed to save the resumed mission to a separate file. What's more, when you resume a mission during replay of a mission film, you're stuck with the same helicopters, with exactly the same weapons configurations, that you had originally.

However, by exporting the saved mission to the Mission Builder, you can fly it as many times as you want, using a different combination of helicopters and ordnance each time. More important, every time you fly the mission, you'll be eligible for any decorations and promotions you have coming to you. Also, every time you fly the mission, you can save the results as a separate mission film.

The other intriguing possibility that the Mission Builder allows is a detailed look at the enemy forces you'll be up against, and their placement, before you ever leave the ground. Think about it. You begin a computer-generated mission and immediately hit Alt-E to end it. (Sure, you'll get a terrible score but, hey, that's what the Recover Previous Duty Roster option is for, right?) Then immediately export the mission to the Mission Builder and select Edit. Now you can go in and have a look around. You'll be able to see and identify every enemy unit, and get its exact location on the map. Take your time and figure out exactly what you'll have to do to get the job done.

Now I realize many of you would never dream of doing such a thing, and with good reason. Much of the excitement of playing *Gunship 2000* comes from the realism of not knowing what's around the next hill. Well, whether you

consider this glimpse into the future cheating or simply real-time satellite surveillance, you have to admit that this is one powerful feature. Use it with discretion.

Since knowing exactly what types of enemy units you'll encounter on a mission and their exact locations takes much of the challenge out of playing *Gunship 2000*, missions that you create for yourself will never be as enjoyable to you as those designed by someone else. You'll get much more out of the Mission Builder if you use it to create new missions to trade with other *Gunship 2000* enthusiasts.

Check the on-line bulletin boards where MicroProse maintains forums; look for other *Gunship 2000* players with missions to swap. These BBSs include CompuServe, Prodigy, PC-Link, Delphi, GEnie, and several others. In addition, MicroProse operates its own BBS, which you can access directly. (See page 63 of the Islands & Ice manual for a complete list.)

Islands & Ice is not simply a scenario disk with integrated Mission Builder. It is also a significant upgrade to *Gunship 2000* that offers several new options. These include a new control option—proportional collective control—that works in conjunction with the two-joystick mode. It allows you to use the second joystick to reduce the collective to zero by pulling the stick all the way back, or to increase it to full by pushing the stick all the way forward.

Another excellent feature of the upgrade is a mission summary text file that is automatically created and stored in the program's directory as SUMMARY.TXT after every mission. The mission summary lists the date the mission was flown, the pilot, the mission status at completion, the total mission time, any awards earned for the mission, the mission score, performance ratings for friendly pilots, and the targets that were destroyed along with the pilots responsible.

Perhaps the most significant new feature of the upgrade, however, is the availability of mission assets. To help you complete some of the more difficult missions, you can now call in artillery support or, in some cases, tactical air support.

If artillery support is available, you can use it only three times during a mission. What's more, you can only order one air strike during a mission for which tactical air support is available.

JUST FOR FUN

What's that? You say you've flown every type of *Gunship 2000* mission there is to fly, received every decoration there is to receive, won a number of campaigns, and worked your way up through the ranks to Brigadier General? You say you're tired of dodging SAMs and want to try something that's a little goofy and just plain fun? Well, here are some of the *Gunship 2000* activities that you can try when you're tired of playing seriously and feel like fooling around.

Warning . . . if you take your simulators very seriously, you may want to skip ahead to the next section!

Stunt Flying

On practically every *Gunship 2000* map there are places where you can do some impressive stunt flying—things you'd never dream of trying away from the safety of the simulated world inside your computer. For instance, did you know it's possible to fly any *Gunship 2000* helicopter through the rail tunnels? This is not only fun, it's also useful for sneaking up on objectives that are located near the opposite end of the tunnel. Simply drop your altitude to around 100 feet, align your chopper with the train track, and head for the tunnel entrance.

Similarly, you can fire rockets and missiles directly through tunnels to kill defenders on the other side. The next time your mission involves intercepting an enemy train, try blasting it with Hellfire missiles fired directly through the tunnel.

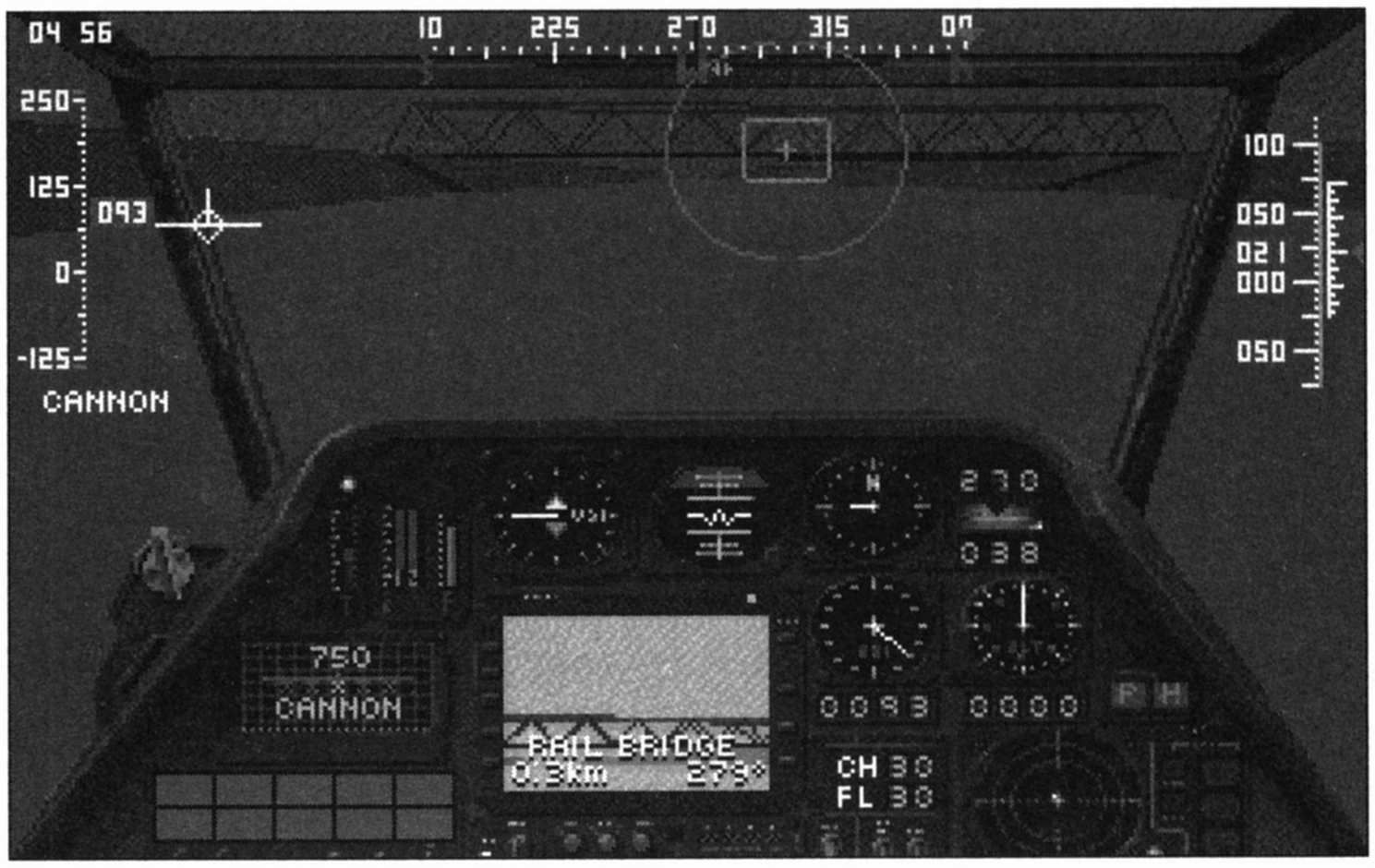


Figure 4.4 Chopper "Limbo"

Another stunt that you can try is flying under rail bridges and road bridges. The Central Europe training mission is a good place to try this one. From the base, just head to the northwest (about 300 to 320 degrees) until you reach the river. Follow it directly northward at an altitude of 50 feet or less. When you reach the rail bridge, you should be able to pass safely under it.

If you've got the Islands & Ice scenario disk, you'll also be able to pilot your helicopter directly *under* a building.

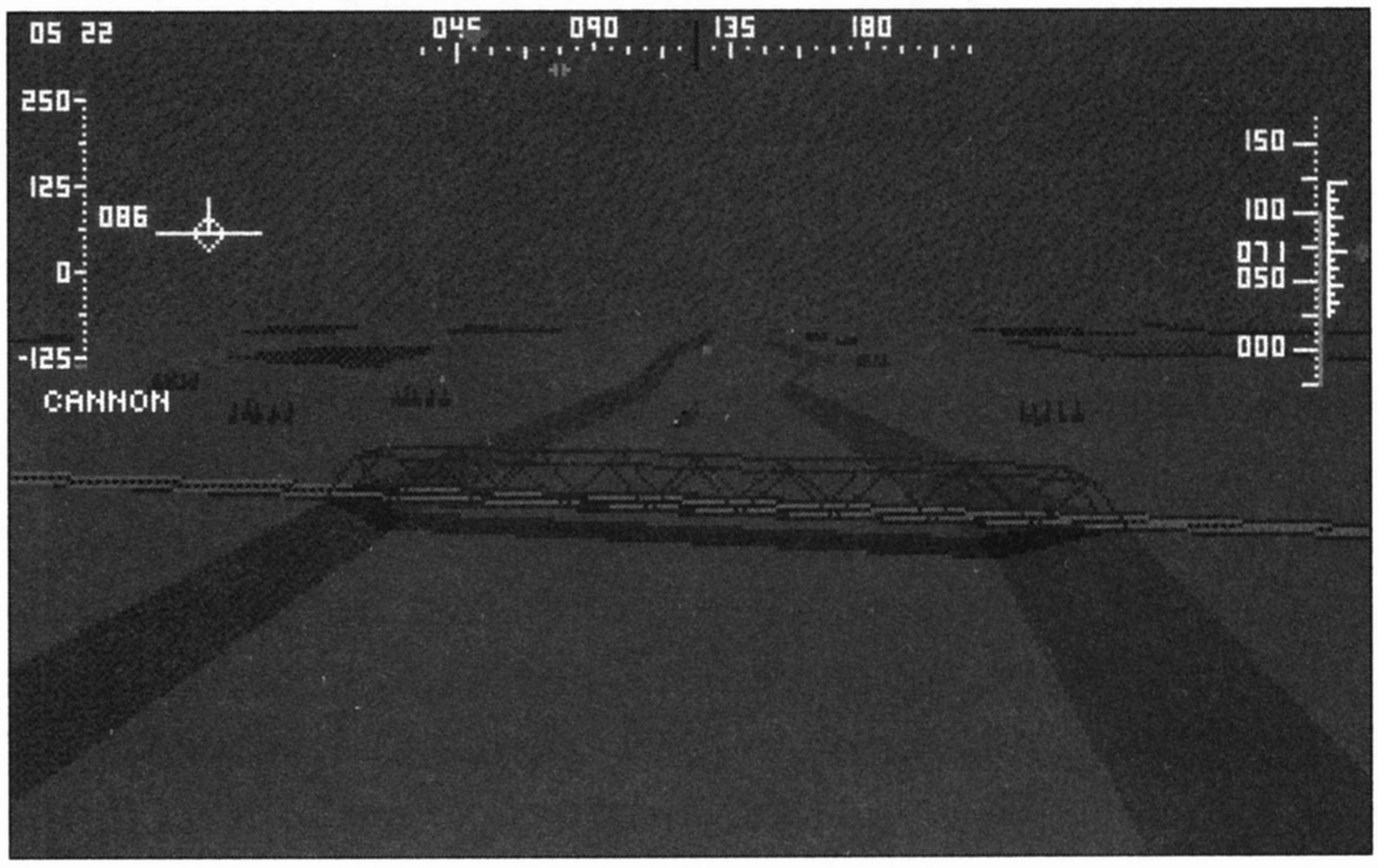


Figure 4.5 At 50' or less you should pass safely below the bridge

Simply look for a place in the urban area of Central Europe where the road actually passes beneath a building and follow that road! Another Islands & Ice possibility is flying through the ice tunnels of Antarctica. You may have to do a little searching to find these.



Figure 4.6 Rock 'n' Roll your Black Hawk

We all know that the modern military helicopter isn't the most agile aircraft in the world. In fact, until I tried it for myself, I didn't believe it was possible to roll any of the *Gunship 2000* helicopters. To my surprise, they can all be rolled—even the 10-ton Black Hawk! Start with something a little smaller, though, like a Comanche. Fly up to the maximum altitude (1,498 feet), stabilize the chopper, and then push the cyclic all the way to the left or right while in a slight dive. You'll definitely lose a lot of altitude, but you should be able to pull her all the way around before you hit the deck.

New Hot Spot

You may have already discovered this, but if you haven't, here's a new hot spot to click on. When you're at the main screen (you know, the room with the map on the wall, the

choppers outside, and the two military types working at desks), click on the computer screen of the guy who's working in the background. *Surprise!* In addition to the text that's usually displayed, you can run *Pong*, a Windows type of environment, or even *Gunship 2000* on this computer! Just remember to change it back to the scrolling text when you're done. You wouldn't want to get the guy in trouble or anything.

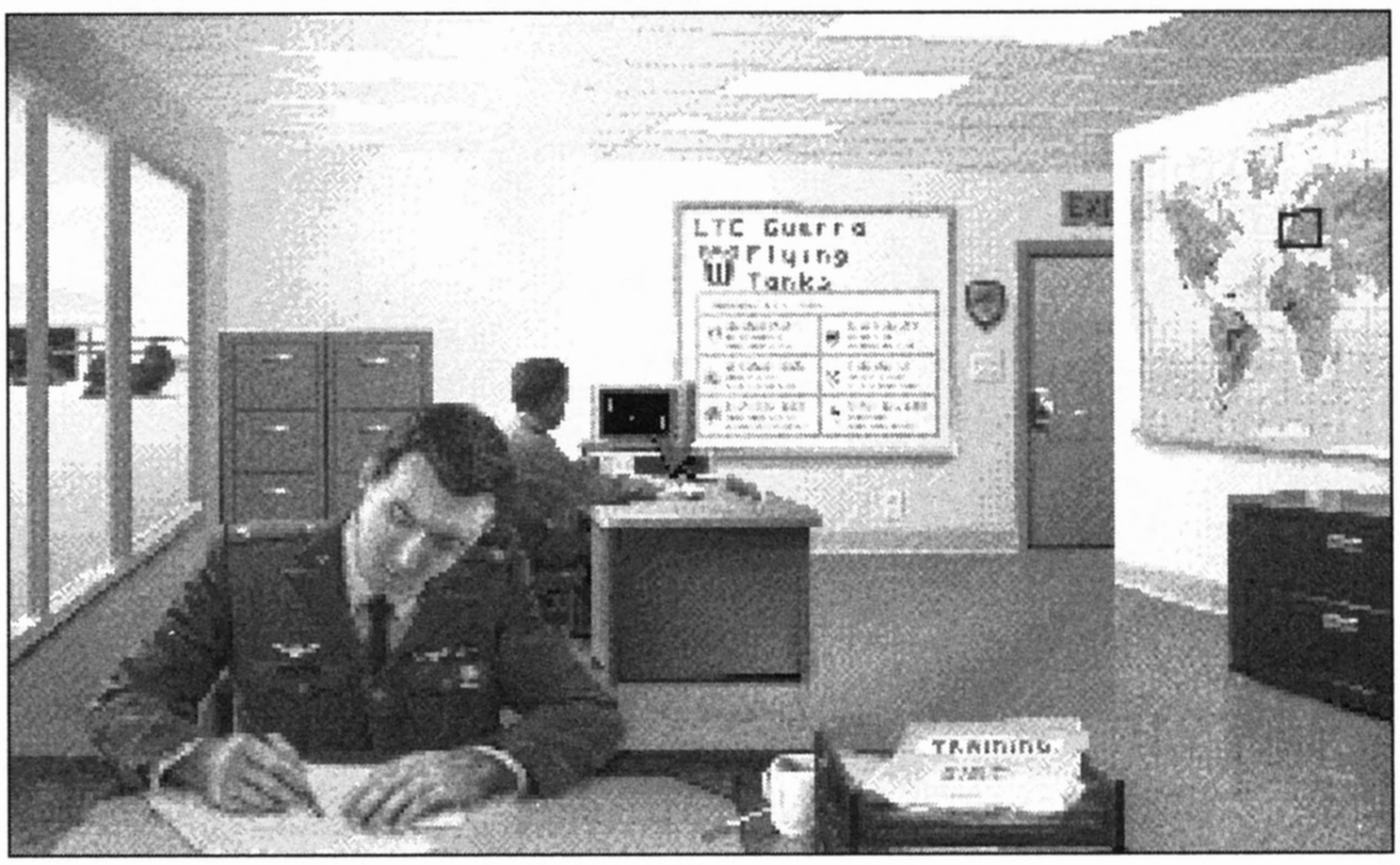


Figure 4.7 *Pong* anyone?

This is the only hot spot on the screen that doesn't serve any useful purpose. Jim Day and company actually considered adding others, but ultimately decided against it. Other hot spots under consideration included the light switch (to turn the room lights on and off) and the electrical outlet (sparks). Other visual effects that were considered and eventually left out of the game included having the guys in this office age as they waited for the player to make a selection, and having the choppers seen through the window randomly take off and land.

Go Hunting

If you're an animal rights activist, this one's definitely not for you, but the next time you're flying around the Philippines

and can't find your objective, look for water buffalo instead. That's right, in every theater there are indigenous animals just waiting to become trophies on the wall of your study. Not only are there buffalo in the Philippines, but there are also cows in Central Europe, camels in the Middle East, and penguins in Antarctica.

Now I realize there really isn't all that much challenge to splattering an unarmed herd of cows across the countryside with a salvo of M261 rockets (the obvious weapon of choice in this case). But the fun part here isn't actually shooting the animals. It's finding them in the first place. And besides, you never know when that herd of cows will turn out to be an enemy infantry squad in disguise. You can't be too careful.

You may find it interesting to note that in the German release of *Gunship 2000*, the animals are indestructible. Really. You could hit a penguin with a Penguin (the missile, that is) and it wouldn't even blink. Seems that some regulation of the German government forbids the killing of animals in a computer game. Luckily, they have no similar regulation against the killing of enemy tanks.

Billboard Search

If hunting for poor, defenseless animals isn't exactly your idea of fun, how about a good, old-fashioned billboard hunt? On every *Gunship 2000* map with the exception of the urban world in Central Europe, there's a billboard advertising some MicroProse product (Tank, F-22, F-117A), or the company itself (MPS). See if you can find all 13 billboards and gun them down. (*Hint*: The ones in Central Europe and in the Persian Gulf are along roads.)

Abracadabra

Did you know that it's possible to make helicopters disappear in mid-air? Because of the way the *Gunship 2000* helicopters are constructed and the fact that they can't collide with one

another, it's actually possible to make more than one helicopter occupy the same space! Simply give all the helicopters in your flight individual orders to fly to the same location. When they reach their destination, you may have to do a little fine tuning to get some of the less experienced pilots to line up correctly. Then just fly into the pile. On the chase view you'll see just one hybrid mega-chopper.

How Low Can You Go?

We've all had really bad missions, but here's your chance to go for an all-time low. Compete with friends to see who can get the worst (negative) score. Start by giving everyone in



Figure 4.8 Compete for the worst score!

your flight a Longbow Apache. Take off and immediately destroy your own base. In fact, blow away every friendly you come across. Then get the other choppers under your command killed. Send them into enemy territory with their weapons on hold, or simply let them keep flying until they run out of gas. If there's a FARP, you'll want to cause some destruction there as well. Finally, climb to about 1,400 feet, look for a nice spot on the ground, and aim for it as you disengage your rotor. Just be careful not to crash into the primary. You might take out a few defenders and decrease your negative score.

INTERVIEW (JIM DAY, DARRELL DENNIES, AND DETMAR PETERKE)

No matter how many hours you spend playing with a simulator like *Gunship 2000,* there are always things about the program, its creation and its design, that you may never discover on your own. Sometimes, the only way to truly understand what is involved in the development of such a game is to go to its designers and programmers for a behind-the-scenes look at how they work and how they came to be involved with the specific project.

While writing this book, I was fortunate enough to have the opportunity to meet with Jim Day, the chief designer of *Gunship 2000,* and two of the game's programmers, Darrell Dennies and Detmar Peterke, who worked to bring the simulator to life. For more than two hours, this talented team of software developers fielded dozens of questions about their work in the creation of *Gunship 2000,* the Mission Builder, and the Islands & Ice scenario disk.

The following is a condensed version of our conversation, which took place on June 19, 1992, at MicroProse in Hunt Valley, Maryland. At the time, the team was right in the middle of development on the new Mission Builder/scenario package. Their enthusiasm for the project was evident.

Q: How did you come to be involved with the *Gunship 2000* project?

Darrell Dennies: I started out with MicroProse by doing translations of Commodore 64 titles for British computers that were based on the Z-80 chip. One of the early translations that I worked on was the original *Gunship*. Before the *Gunship 2000* project came along, I was already working on a Road Warrior-type game in which you'd drive around. For this game, I decided to build the three-dimensional world from the ground up, rather than creating a horizon and just putting objects out there that get bigger as you approach them. This system I developed evolved into the 3-D topographic world used in *Gunship 2000*.

Detmar Peterke: I had just started at MicroProse in August 1990, and *Gunship 2000* was actually my first project. Before I came to MicroProse I worked as a programmer for businesses around Maryland on really boring stuff like databases. When I started here (at MicroProse) I almost ended up working on Nintendo games, but I'm happy with the way things worked out.

Q: So from the beginning of development to the time *Gunship 2000* hit the stores was just over a year. Is this how long most projects usually take?

Jim Day: No, actually the development of *Gunship 2000* took less time from beginning to end than the length of time some other simulators, such as *Falcon* or *Secret Weapons of the Luftwaffe*, were late in getting out! Also, the main development team for *Gunship 2000* was small. Only four people were directly involved in every phase—myself, Darrell, Detmar, and Mike Reis, who did the art.

Q: Did that differ from previous projects?

JD: In the old days, the whole company would get involved in a single project. All the resources that the company had available were devoted to that project. This was the case for the original *Gunship*, as well as for projects like *F-19 Stealth Fighter*.

Q: Are there any secrets or tricks that you can use while playing *Gunship 2000* to boost your score?

JD: We're trying to present a serious subject, so we don't leave a lot of those little hooks in there where you can do certain things and then all of a sudden magical things happen. We create some of those things for developmental reasons, but all that stuff gets pulled out before the game is shipped.

We always kid and say, well, those are the things you'd find if you were playing our Nintendo game. We even had one guy who wrote in about the waterfall in one of the European worlds. He said he hoped that by flying through the waterfall he could end up in this mystery world out on this fantasy planet and all this other kind of stuff. You find the hidden things in other types of games. There are no switches left in that make you invincible or give you unlimited ammunition or anything.

Q: Whose voice are we actually hearing when the CP/G announces *"Incoming front!"*?

JD: That's a guy who works here, Doug Kaufman. We tried to find someone with a clear speaking voice who could give us the kind of intonation we were looking for. Doug has done voices for other projects around here, and actually studied acting at one point. We figure out what words we're going to need—*Target, incoming, primary, right, front, left*, and so forth—and record each word separately. Then the words are combined in various ways depending on the situation.

Q: What can you do in *Gunship 2000* just for fun? Just to goof off?

JD: Let's see, you can fly through the railroad tunnel; you can roll the Apache . . .

Q: Just the Apache?

JD: No, you can roll just about—well, I don't think you could roll the Black Hawk. It'd be tough. The flight models are different from helicopter to helicopter. You'd have no problem rolling a Comanche or a Defender, however.

And we've got more tunnels in the new theaters that you can fly through. In the urban world we've got places where the roads go underneath buildings. There are snow tunnels in Antarctica. Realistically you'd never be able to fly a helicopter through a railroad tunnel. I mean it's tight. You're gonna have to be good to get through there.

DD: It's cool to shoot the train through the tunnel as well, because the missile will go through the tunnel.

JD: Yeah, you can. You can actually sit at one end and if the train's coming the other way you can shoot him right through the railroad tunnel.

Q: Do you get extra points for that?

JD: No, you have only your personal satisfaction that you shot the train through the railroad tunnel.

Q: Why were Antarctica and the Philippines chosen as the settings of the new scenarios?

JD: It was important to be able to create areas that were distinctly different in terms of visual presentation. You could say, "OK, fine, we'll do another area in Europe," but it would look the same. How different could you make it? Also, the enemy was a factor. Who are you working against? If you're going to be someplace else in Europe, who are we fighting? The French? So that's how Antarctica came about. It's a very different presentation visually.

The Philippines represents the whole idea of an island. Fly from this island to this island. So the idea behind the Philippines was that you could have something different. We weren't going to have another desert world; we've already got that. Also, you're limited visually as to how different you can make anything look, terrain-wise.

We had some ideas of what we wanted, but we actually went out on the boards and said, "Hey, if we do some more theaters, what do you want to see?" So after we pulled out the Mountains of Mars, Civil War Gunship, Gunship versus the Dinosaurs, Jurassic Gunship, Gunship 200,000 B.C., and so on, we saw that a lot of people had asked about

Antarctica or the Arctic.

A lot of people asked about an urban area. That wasn't big enough so that you'd make a whole theater out of it, but putting an urban setting in Europe worked very well. There were also a fair number of people who asked about island-hopping. A lot of it related to the drug trade and things like that.

So we said, OK, let's do Antarctica because we can create a story line there. We could create a reasonably believable situation going on down there because it's futuristic and such, and we chose the Philippines again because there's a fair amount of unrest there and we could create a reasonable story line of something going on and still have the island situation.

We weren't real keen on that drug thing. We didn't feel we could really create a realistic enemy. I mean, how strong could they be? We wanted to have a situation where the enemy was reasonably equipped so you'd have a force to fight.

Q: What type of low-level terrain is featured in the new theaters? (*To Darrell:*) Is that something you'd work on?

DD: No, I work on the code that displays the terrain, and people like Jim—we've got more guys working on it now—they would actually build the terrain using tools. We've got a number of in-house tools that build in 3-D. We did come up with a couple ideas specific to Antarctica. We have magnetic storms; we have snowstorms. That's part of the creative process. That's the way we work. If we just had to write code, we probably wouldn't do it. We have to write code that will be different or add some new feature or just be cool in some way. The snowstorm is just a visual effect, but it seemed to work pretty good, so we went for it.

JD: As you're looking out, everything becomes obscured by the snow going through and it affects the wind gusting and this kind of stuff. It's just something that's unique to Antarctica.

Q: Do you get to take heavier loads in Antarctica because the air is colder and, therefore, more dense?

JD: Actually a little less, because a temperature of around 70 degrees is the optimum and as you go below that it's even worse. Of course the setting is during the Antarctic summer, which is around January, so it might hit 50 degrees on a good day. Also, you don't have any night, just dusk. That's something we still have to take care of.

DD: Yeah, we can do a dusk. I've done dusk.

JD: So most of your missions are more likely to be flown in the daytime, so you're going to be dealing with 30 to 40 degrees. Actually, compared to flying in Europe, you'll potentially be carrying even less. We've adjusted that somewhat, because if it's really cold, the helicopter won't fly. It all relates to temperature and barometric pressure, air density, all of these types of things. We've made it so it's somewhat different from what you've already experienced. Because in Europe it's only in a rare situation at night that it's so cold that you'd get any ill effects that would work against you. You see that fairly often in the desert, especially if you're playing in the daytime. Antarctica would fall in there somewhere near that. The Philippines will be tougher because of the temperature. That will be closer to how it is in the desert.

Q: Is the amount of load you can carry only affected by weather if you're in the realistic flight mode?

JD: Lift is independent of that. Your lift limitations—what you can load on your helicopter—are purely related to where you're at, temperature, and so on. That's not related to whether you're using easy or realistic flight. Your flight response is affected if you're using realistic flight, but not what you can load onto your helicopter.

Q: Somebody mentioned rolling your helicopter before. Can you do that in the easy flight mode or just in the realistic mode?

JD: I don't think you can roll in the easy mode, can you?

DD: I don't think so.

JD: No.

DD: Because you could roll in one position, couldn't you?

JD: Yeah. No, you can't roll in the easy mode. See, a lot of times people ask us questions about easy flight and we don't know the answers, because we never fly in the easy mode. A lot of people say, "Gee, I just had this happen," and it's like, "God, I'll have to go out and try it," 'cause I honestly don't know. We never fly in easy mode because in realistic flight you can do so much more. Some people will talk about it and say, "Yeah, but it's really hard." But once you get in and fly a realistic flight it's really not that bad.

DD: Easy flight is just a carryover from the original *Gunship,* and that was only in there because real flight was so hard. We think our realistic flight isn't that hard.

JD: Our realistic flight is much more forgiving than it was in the original game. I remember when I got it I didn't work here or anywhere related to MicroProse, and I was flying, but it was hard to try to have a stable helicopter in that mode. So when fortune brought me here and I was working on the helicopter game, I said to Darrell, "We're not going to have that realistic flight as hard as it was in the original game." He agreed totally. We've got to have something reasonable. You're not buying this game to become a damn helicopter pilot. You buy it to have fun.

DD: Even real helicopters have computers to stabilize your flight, anyway. Though we did get a couple of complaints when we had both the rudder and the cyclic acting on one stick which, you know, the Apache can do. But people complained about it because they wanted a separate rudder.

JD: And so that's why we added the foot pedal with the control and all that kind of thing so again, hey, if people wanted to have that, we could reasonably do that. In doing the original game we didn't have time to put all that together, but once we were able to, we put in foot pedals, and two joysticks, and now, of course, we support Thrustmaster and that kind of stuff.

Having the tail rotor control, you can definitely pull some very quick turns which is more realistic, so when people were complaining before we had it, we didn't disagree with them. They had a valid point. Whereas some people take it to the extreme, you know, because on the bulletin boards there are no fringe people. There would be the people who would say about the game, "Hey, it's fine," and for other people, the fact that you didn't have this tail rudder in there ruined the game. "Don't even bother playing it," you know, that type of thing.

So we tend to take a somewhat more reasonable path now and then, but for the people who were the real sim freaks, we added all that kind of stuff. Your everyday guy isn't necessarily going to go out and buy a set of foot pedals. I don't use them usually either. I like having the keys. I prefer having the tail rudder there.

Q: In a real helicopter you have the foot pedals for your rudder, you have the collective stick . . .

JD: The collective sits on the left.

DD: It's like a pull-up hand brake. But because these are intelligent machines, normally they tie the cyclic to the rudder.

JD: We talked a lot with pilots when we were doing the game, and once they're into forward flight, they don't have their feet on the pedals at all. You don't mess with your collective, either, once you're in forward flight. You do all of your altitude changes through the cyclic just like you would do in realistic flight. When you play the game, you get to where you want to be, altitude-wise, and then really all the altitude changes you do, other than if you're coming in for a landing, you do with your stick. You don't mess with the collective at all, and that's really how they fly helicopters.

If you want to dive you push down, and if you want to climb you pull up, and that's really how they fly. They only have their feet on the pedals if they want to pull a really tight turn. So you get a lot of people who don't have a clue as to how a helicopter flies, and they'll be on the board

saying, "Yeah, it doesn't do this, and this, and this . . ." So you have to deal with a lot of that stuff and try to explain what it does. Fortunately, a lot of helicopter pilots came on and agreed with us.

That's one thing that you can mention. You can emphasize to people to get into realistic flight as soon as possible, because once you get into it and get over the fear of going down, you'll do much better.

Q: Is it possible to lose altitude as a result of raising the collective?

DD: Not that in itself, but depending on what combination you have with the cyclic you could actually be raising the collective, and if you fall out of translational lift, you're gonna go down even if you've raised the collective to the maximum. Because you've gotten out of that phase of helicopter flight that has translational lift, you actually could have started to drop. Translational lift relates to forward speed. There's a peak. As you start out you have none. If you set your helicopter at a certain collective and don't touch it, as you go forward you'll reach a point where you'll start to go up without adding any additional collective. That's called translational lift—you gain lift through the forward motion of your helicopter. Then you reach a speed at which it starts to go down because you've gotten beyond that phase. At that point you'd have to add collective to maintain your altitude. So it's sort of a curve.

Q: So why is it that when you lower the collective to land, you only drop so many feet before you level off and have to reduce the collective again?

JD: You're picking up ground-effect lift.

Q: Are there any tactics or combat techniques that are particularly important for people to master?

DD: With the regular Hellfires you can have multiple targets and if, for example, there are four targets, you can fire four Hellfires and usually they will take out all four targets in succession. It's called ripple-fire, and it's one of my favorite features because you can watch it in your CRT.

JD: Ripple-fire is a very important tactic that you want to recommend to people, because with regular Hellfires, people complain that one of the drawbacks is their flight time—because while I'm waiting for the Hellfire to fly into the target (you have to maintain the lock), they're shooting at me. Especially if you're coming up against an objective and there are multiple targets. So *use ripple-fire!*

And experience will tell you how long you want to wait but you fire one, and then you pause, fire the next one, pause, fire the next one, and so forth, so that you have four or five of them in the air at one time. If you fire them too quickly, there's the danger that they'll hit the same target because the targeting system will not have jumped to the new target yet. You wait a couple of beats and that way you have all these Hellfires in the air at one time and they just go *Bang! Bang! Bang! Bang! Bang!* . . . You can just see 'em impacting on multiple targets, so you've cut your exposure time down significantly as opposed to this: I launch a single Hellfire. It hits the target. Then I launch the next one. It hits the target. Meanwhile, all of these guys are shooting at me.

With millimeter-wave, of course, you just pick your targets one right after the other and launch them.

Once you launch rockets in constraints, they're "fire-and-forget" weapons. They just go straight. Rockets are useful because you can carry a lot of them and, of course, depending on the type, it may take different amounts to destroy something. The big drawback is range, because it's only 3 km.

Q: In some cases, weapons have long ranges but if you're not flying high enough, you're not going to acquire the target early enough to take advantage of the range.

JD: That's right, so again that's something you have to decide. If you're going in right on the deck, having something that can shoot 6 km isn't that significant.

DD: One nice feature is the mast-mounted sight, because it allows you to hide behind a mountain 6 km away and blast away at the enemy without being seen.

JD: The ability to target with the mast was a feature that we really wanted to have in the original release of *Gunship 2000,* but we didn't have time to implement it. That was one of the first things we wanted to add when we began doing updates.

Before you could target with the mast-mounted sight, it basically didn't do you much good at all. It was sort of like the mast on EA's LHX. We really wanted to have the mast work like it was supposed to work—you could view from cover, and engage and destroy targets from cover, and the guys with you could basically engage targets and fire blindly from cover given the fact that you're handing off target information to them. That makes a big difference. That's why when I fly the game, I usually fly a Kiowa so I can pull in behind the terrain, and if I've got guys with me we can usually blast the crap out of 'em.

DD: The enemy never knows what hit them. They're just sitting there.

JD: You also receive a lot of bonus points for flying the Kiowa. So I don't get to carry as much, but if you want to score the big points, the whole idea is that you're going to go out with a little less yourself. You're not going to go out with a Longbow. Not that you can't take a Longbow out and have a good mission. You can. But you're not gonna go out with five Longbows and have a Medal of Honor mission. It's not that we have some restriction that says if you go out with five Longbows you can't get the Medal of Honor. It's just that the way the points shake out, it probably won't happen.

Q: What's a good average score to shoot for if somebody wants to gauge how well they do?

JD: If you're scoring 700 to 800 points per mission, that's a decent score. If you flew an entire career and scored, on average, 800 points, you'd have a real nice career. I mean, you wouldn't get a lot of the real high medals, but you'd retire as a general.

Q: What's the highest score you've ever achieved on a single mission?

JD: Let's see . . . I've scored 2,019 points.

Q: Yeah, but you must have cheated.

JD: No, that was a legit mission. And the highest score we ever saw was a guy—now, we're taking his word on this—who scored slightly over 2,100 points. He put his replay up on the boards and all that stuff.

Like I said, the highest I ever scored was 2,019 points, and that was a hell of a mission. I mean there were twenty-odd targets destroyed. To get a Medal of Honor, you have to score 1,700 points, you have to be flying against Crack and Elite guys, you have to get the primary and secondary, you have to make it back; you know, you have to do all these things.

Q: Can you lose a helicopter?

JD: You could, but the points you lose for losing a helicopter would make it hard. On my mission, I actually could have lost a helicopter and still scored 1,700 points, because the penalty for losing a helicopter is 100 points times the difficulty modifier, so I would have lost 200 points, so I could have had a guy shot down and still would have received the Medal of Honor.

A Medal of Honor winner is going to be a particular mission that just has the right mix of things. Because of the random mission generation system, you can honestly say that not every mission has the potential to be a Medal of Honor mission. Because of the combination of target types, where they're located, these types of things, it's just not going to work out for you every time. That's just reality.

On that mission on which I scored over 2,000 points, the primary was a moving target, which is the easiest kind of target to engage. They're usually in open terrain. The defenders are spread out because they're moving; and because they're moving, only some of the guys stop to engage you. So moving targets are, by far, the easiest targets to go after.

So the primary was a moving target and the secondary . . . I forget what it was. But I had five Comanches on that

mission and my pilots were real good guys. And we went out there and just kicked butt! I mean I had a number of guys who were duking it out with enemy helicopters, and one guy who used up all his ordnance and, even on the way back, he shot an enemy helicopter down with just his cannon. So, all those things came together and I found the moving guys pretty quickly and wiped 'em out. Then I was able to go out and wipe out a bunch of other guys that were in the area, and everybody made it back. And I actually scored those points in the desert, which is much harder than in Europe.

Q: Because Europe is the more difficult theater you would have gotten more points there?

JD: You get more points, right, because the weapon systems in Europe are more advanced.

Q: And how do the new theaters stack up?

JD: Antarctica is going to be fairly difficult, because the weapon systems that the Argentineans and the Chileans have are pretty sophisticated and because it's a bit futuristic. So it will be as difficult as Europe is. And the Philippines will be more comparable to the Persian Gulf.

Q: Have you considered doing any new helicopters to go with the new theaters?

JD: We talked about it and there were a couple we could have done, but one of the big limitations we had with helicopters was the art. We didn't quite have the art resources for doing the scenario disk that we did in the original product. There's a lot of art associated with a new helicopter. Mainly in the weapons/arming screens. Because you've got the helicopter, and you've got all the weapons, and all those are individual pieces that have to be drawn. Logically, it wasn't a big deal necessarily but . . .

DP: That's not a big thing in game design, to be able to drop in another helicopter.

Q: So that's not ruled out at some time in the future?

JD: We're really looking to see how well this scenario

disk does. We have no reason to believe it won't do very well. Especially considering what's in it. If it does well, we're even planning others for the future. We've talked about the new helicopters; we haven't thought so much about any theaters. We'd like to do a whole expanded speech package, but that would then involve adding expanded memory on top.

Q: Would you still be talking about something that would run on a 286-based machine?

JD: Yeah. You can do expanded memory on a 286. It wouldn't be as fancy as some of these 386 products that are coming out, but we would make it in a way that you could still run it on your 286. We wouldn't want to add a scenario disk that would only be good for 386 people. There will not be an EGA version of the scenario disk. That was a decision we made, so we're already cutting out that market, which is pretty small now anyway. But if we did a second scenario disk it would still run on a 286. The original machines we supported, it would still do.

Q: Could you show me the Mission Builder?

JD: I've got part of the prototype right here that I could show you. (*Demonstrates.*) So again, I'd go in here and I would see "Simulated" and I would choose that and go out the door. Here I am in the Mission Builder.

The first thing that would come up that you didn't see in the original *Gunship 2000* is a panel that is somewhat like the replay panel, and this is where you'd be able to load existing missions you've created. We're also designing it so that you can load a replay into the Mission Builder and use that as the basis for a new mission. The theater is going to be determined by what you pick on the map, of course. And then you'd be able to come in and pick a world.

You see here all these buttons that let you set temperature, wind speed and direction, visibility, time of day, and so on. Then these are the icons for the different types of units that you can pick. We've got helicopters,

tanks, triple-A, infantry, vehicles, structures, ships, SAMs, just fighting vehicles, and enemy aircraft.

Q: So would you click on a unit and just sort of drag it to the map where you want it, and drop it?

JD: Yeah, and on the maps there are different options. This is just a regular map, so I'm going to click here and get my working map. Okay. I can move this little yellow box around the map to show me the area I want to look at.

I'll say, okay, I want formations of tanks. So this gives me all my tank formations. And see, up here it's showing me what their layout is, over here on the right. This shows me what's in it. I can click and there's one guy highlighted. I can click the right button and it's gonna go between the different guys and tell me what they are.

Q: So that mech group is automatically supported by a towed gun?

JD: In the mech group itself you've got a tank there; there's a Zoo; there's another tank; there's a BMP; and then there's another tank, and another BMP. It tells you what kind of weapons they have. And I can say, okay, yeah. I want that guy. Okay, now I've got him and I can go around here on the map and place him down. And I'm gonna say okay, give me one of these guys. I want some extra cover here, so I might drop this 2S6. I'm gonna put one of them right here, and maybe another one right up here. I want to make that guy point attack and I want that to be my primary.

So I go on and on, and this down here is keeping track of what I've put out and how many guys I have remaining to put out. I don't have to put in all these guys individually. I can put in just a few and then I can hit the Fill button and the Mission Builder will put the rest in for me. It does a random selection of guys just like the mission generator would do. And if I don't like the result, I can re-fill it or I can go in after I fill them all in and pick some guys up.

So again you've got all the different guys, different

formations, all the different kinds of buildings and bunkers, and cows and that kind of stuff, which you can put out for yourself.

So you can basically do anything you want. You want to put out twenty enemy planes, okay, go ahead and do that. I mean, you'll get pretty well smashed, but if you want to put out 20 enemy planes, you do that. The whole idea, again, is that the player can make it what he wants to make it. You make the kind of mission you want. If you want to have one bad guy and have the rest be cows, okay, that's exactly what you do. That's your mission. If I want to go in and say, I want to put my base right next to these guys, okay. A mission generator would never do that, but if that's what you want as your mission, okay. Don't even take off. If you want to shoot from the ground, make it whatever you want it to be.

We're very pleased with the Mission Builder, with how it's come out. We think the interface is very good, very intuitive, and I've not seen mission builders by other companies that allow you to do as much as you can do here.

And the great thing is that now you can make up a mission and give it to a friend. You can create competitions—for instance, I can make a mission and then you and Darrell can each fly it. But you fly it with your helicopter group, and he flies it with his. So he's got Darrell and his guys, and you've got Bob and your guys, but the mission is exactly the same. You both go out and fly exactly the same mission to see who can do the best.

We really think a lot will come from that. You'll see a lot of that on the boards—people will say, "Hey I just made this mission! Can you upload it? Try this one out." And so forth. This is gonna be a big plus. We think this scenario disk, with the two theaters and the Mission Builder, is a great value. I mean, you're getting a lot. Look, if LucasFilm can sell you, for $39.95, a single plane for *Secret Weapons of the Luftwaffe* . . . that's okay. We have nothing against that. But here you're really getting some value in this product.

Part of it is that we wanted to do something for the customer. Way back when we were first talking about doing a product, we had indicated that the Mission Builder was going to be included in the game, but it wasn't, because we couldn't get it done in time. If we had put it in, it wouldn't have been as elaborate as this. So we feel a certain obligation to give 'em good value on the product. Not "We'll sell you the theaters and then we'll sell you the Mission Builder separately," that type of thing.

One of the nice features in the new scenario disk, too, is that I can have friendly support for myself, whether it be artillery or air strikes. So I can call in a friendly air strike and a plane comes in and attacks the area that I designate.

Q: With the current version (*at the time of the interview it was 496.06*), you might see friendly forces close to the bases, but they don't seem to be of any help.

JD: That's right, they're just decoration. You'll see 'em much more often on single-helicopter missions, because we don't put out as many bad guys and we make up the difference by putting some friendly guys out. Each mission has so many objects that need to be in there, so we put out friendly guys but they don't do anything. Here, however, if I select this MLRS battery, there actually is an MLRS battery out there and it actually shoots when I call for the artillery.

Q: Do you call for artillery during mission creation?

JD: No, during the mission itself. There'll be a new option on the map mode. So if you happen to be around these guys when you tell them to shoot, you'll actually see them rotate toward the target.

Q: So could that be used to draw fire away from the direction you're approaching?

JD: The enemy isn't that intelligent. But you can certainly use it to soften 'em up, destroy what may be in the area, call artillery in to something you discover. Certainly the friendly air support is very devastating—the plane goes in and just annihilates 'em.

DD: We added a new view, the chase/target view, so that if you can pick something up in your target, you can then do a Shift-F8 and you'll chase that target from his chase view.

JD: And the best way to use that is on the plane. The friendly plane flies across the map. So when you call in an air strike he comes from your territory, flies across the map, and goes into the target, so if you pick him up (visually), you can hit the Shift-F8 view and you'll be able to follow him in.

JD: You'll follow the plane right into the target as he launches his missiles and shoots his cannon and wastes 'em. The planes are very devastating. They go in and really pound the crap out of 'em. So if you happened to have a mission where you had a static target and you had air support, you could just send in the plane.

Q: Can you send an F-15 after a MiG?

JD: If they happen to cross paths, they'll engage each other. I've had many missions where the plane goes in and is shooting enemy helicopters down. I actually had a friendly plane, an F-16, that got shot down by an enemy helicopter. It was a fluke situation. If fact, when it first happened I'm like, "Wow, wait a minute here, I can't understand. What's this going on here?" But it was such a rare situation, it would be about as rare as if a real helicopter could shoot down a high-performance jet.

DD: When we looked at the replay for that, we could see that this enemy helicopter was almost hiding behind a mountain and the F-16 was flying by. He had no idea that this helicopter was there and the helicopter just shot him twice in the tail.

JD: See, it had to be rare. The situation was such that, because the helicopter was facing in the direction the jet was flying, the helicopter didn't have to turn to engage. So he was just sitting there behind this mountain, this jet flies by, and it was like, "Oh, just blast him."

DD: And because he was behind the mountain, the jet

never saw him. The jet will take out anything in its path that it can see.

JD: So I'm playing this mission and I'm thinking, "Where in the hell is this plane?" It never made it back to base. And I go back in the replay and it was shot down by an enemy Hind and I was like, "Wow!" We're glad it was a Falcon that got shot down, not any of our planes. It was pretty neat.

When you see these things happen that you never anticipated, you think, "Wow, that's great. I didn't do that at the time." I mean, I lost a lot of points getting that plane shot down, but it was still neat.

Figure 4.9 General Day flies off into the sunset



Tables

TABLE 1: UPGRADE TABLE

Version 469.03

FEATURES:

- Mouse support
- Dual joystick control option
- Keyboard control simulating a second joystick option
- Foot pedal and/or flight stick control option
- Improved threat missile logic
- Improved friendly helicopter AI logic, radically improving their ability to pick up or drop off
- Dedicated Soundblaster Sound Card support (no pause during speech
- ATI Stereo Sound Card support (no pause during speech)
- Additional fuel
- Allows exit from the map screen to any active view (F1-F9)
- Enhanced target placement on search & destroy missions
- Impact of translational lift adjusted

BUG FIXES:

- Alt-J function was inoperative
- Replay airspeed rolled over to 65,000 when flying in reverse
- Train was at times not running on the track
- Friendly helicopter cannons still fired when destroyed
- The side views (F3 and F4) were rolling in the opposite direction
- Errant joystick returns were causing the game to lock up during flight
- The tail rotor hit probabilities were incorrectly calculated for the Kiowa and Black Hawk helicopters
- The Longbow Apache was listed incorrectly as model B instead of model C
- PS/2 lockups occurred due to speed parameters in IBM sound driver
- The majority of "Please stand by" lockup problems were corrected

Version 469.05

FEATURES:

- Improved enemy AI to simplify the play against lower-quality enemies
- Adjusted the minimum sighting ranges, increasing the approach ranges
- Adjusted overlay utilization, thereby requiring less memory usage
- Implemented fixed objects (bridges and buildings) as potential mission targets
- Added enemy ships as mission defenders
- Tweaked the flight model for added realism
- Added no-crash option to Comanche with gear retracted

BUG FIXES:

- The replay was not calculating resumed mission scores correctly
- Fixed missing Roland sound option from Version 469.03
- Corrected intermittent and fatal losses of altitude while flying under 100 feet
- Background on the good reputation screen was reversed

Version 469.06

FEATURES:

- The functionality of the mast-mounted sight (AH-64C Longbow Apache, OH-58D Kiowa Warrior, and MD530G Defender) has been greatly enhanced; helicopters can now sight, identify, and lock onto targets via the mast-mounted sight and designate targets for other helicopters in the same section
- The poor and average troops are now easier (over and above adjustments made in version 469.05), and decorations are easier to receive at these lower levels
- The time penalty has been moved out to 30 minutes
- Other pilot communications have been expanded and now display on three lines

BUG FIXES:

- Friendly helicopters now engage all targets encountered; previously, they could ignore enemy targets, given the right combination of events
- Corrected display problem with the AH-66A Comanche's landing gear
- Given a certain heading, friendly helicopters would appear to be spinning

- The keyboard shift key could become locked for those running IBM sound
- The game would inexplicably lock up during the flight portion of the game
- Friendly helicopters did not consistently engage unarmed enemy targets

TABLE 2: WEAPONS

AIM-92 Stinger AAM (6 km)—Lightweight all-aspect heat-seeking missile for use against low-flying air threats.

AIM-9R Sidewinder AAM (18 km)—All-aspect heat-seeking missile for use against all air threats.

AGM-122 Sidearm AGM (15 km)—Lightweight anti-radiation missile for use against search or tracking radar sources.

AGM-114A Hellfire AGM (6 km)—Heavyweight laser-guided anti-tank missile for use against all armored threats.

AGM-114B MMW Hellfire AGM (8 km)—Heavyweight millimeter-wave radar-guided anti-tank missile for use against all armored targets.

Helstreak HVM AGM/AAM (7 km)—High-speed laser-beam-riding missile for use against all low-flying air and medium-armored threats.

BGM-71D TOW-2 AGM (4 km)—Medium/heavyweight wire-guided anti-tank missile for use against most armored threats.

Hydra 70 Rocket System (3 km)

M247—Rocket with a shaped-charge warhead for use against most armored threats.

M255—Rocket with a 2,500-flechette warhead for use against unarmored and light air threats.

M261—Rocket with a submunition warhead for use against non-armored or lightly armored threats.

AGM-65D Maverick AGM (25 km)—Heavyweight imaging/infrared-guided missile for use against armored threats.

Penguin-3 Anti-Ship Missile (40 km)—Lightweight imaging/infrared-guided anti-ship missile for use against all oceangoing threats.

SUU-11B/A Minigun POD (1.5 km)—Pod-mounted M197 20mm cannon plus 300 rounds of ammo for use against non-armored or lightly armored threats.

GPU-2/A Gun Pod (1 km)— Pod-mounted M134 7.62mm minigun plus 1,500 rounds of ammo for use against unarmored threats.

TABLE 3: TARGETS

Vehicles and Other Ground Forces

AML-90

Lightly armored vehicle, usually armed with only a machine gun (1.5 km). A limited threat.

Best: Cannon: M247, TOW-2, both Hellfires, Helstreak

Worst: M255: Minipod, Sidearm, Stinger, Sidewinder, Penguin

BMP-1 Infantry Fighting Vehicle

Lightly armored vehicle, usually armed with one MG (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km range). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

BMP-2 Infantry Fighting Vehicle

Lightly armored vehicle, usually armed with an optically controlled cannon (2.0 km) and IR-guided missiles of good quality (7.0 km). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

BRDM-2 Recon Vehicle

Lightly armored vehicle, usually armed with only one MG (1.5 km). A limited threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

BTR-60/70/80 Armored Personnel Carrier

Lightly armored vehicle, usually armed with one MG (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km range). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

EE-9 Reconnaissance Vehicle

Lightly armored vehicle, usually armed with only a machine gun (1.5 km). A limited threat.

Best: Cannon, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

EE-11 Urutu Armored Personnel Carrier

Lightly armored vehicle, usually armed with one MG (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km range). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Infantry Squad

Deployed squad of infantry, usually armed with MGs (1.5 km) and IR-guided missiles of varying quality (4.5 to 8.0 km range). A serious threat.

Best: M255s, Cannon, Minipod, both Hellfires, Maverick

Worst: M247s, Sidearm, Stinger, Sidewinder, Penguin

Mobile Scud Missile Launcher

Lightly armored vehicle, usually armed with only a machine gun (1.5 km). A limited threat.

Best: Cannon, M261s, Minipod, TOW-2, both Hellfires

Worst: M247s, Sidearm, Stinger, Sidewinder, Penguin

MT-LB Armored Personnel Carrier

Lightly armored vehicle, usually armed with one MG (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km range). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

SA-3 Goa Low/Medium Altitude SAM System

Fixed SAM system armed with radar-guided missiles of lesser quality (12.0 km). A potential threat.

Best: Sidearm, Cannon, Minipod, M255s, TOW-2, both Hellfires

Worst: M247, Stinger, Sidewinder, Penguin

SA-6 Gainful Self-Propelled SAM Vehicle

Lightly armored vehicle, armed with an average radar-guided missile (14.0 km). A definite threat.

Best: Sidearm, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

SA-9 Gaskin Self-Propelled SAM Vehicle

Lightly armored vehicle, armed with IR-guided missiles of average quality (7.0 km). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

SA-11 Gadfly Self-Propelled SAM Vehicle

Lightly armored vehicle, armed with a good radar-guided missile (14 km). A definite threat.

Best: Sidearm, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

SA-13 Gopher Self-Propelled SAM Vehicle

Lightly armored vehicle, equipped with IR-guided missiles of excellent quality (8.0 km). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Tank Truck

Unarmored vehicle, usually unarmed. No real threat.

Best: M261s, Cannon, Minipod

Worst: Sidearm, Stinger, Sidewinder, Penguin

Towed Gun

AA gun, armed with an optically (2.0 km) or radar-controlled cannon (2.5 km) plus IR-guided missiles of good quality (7.0 km). A definite threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

T-55M1 Main Battle Tank

Medium/heavily armored tank, usually armed with only a machine gun. A limited threat.

Best: M247s, TOW-2, both Hellfires, Maverick

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

T-62E Main Battle Tank

Medium/heavily armored tank, usually armed with only a machine gun. A limited threat.

Best: M247s, TOW-2, both Hellfires, Maverick

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

T-72M1 Main Battle Tank

Heavily armored tank, usually armed with only a machine gun. A limited threat.

Best: M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

T-80A Main Battle Tank

Heavily armored tank, usually armed with only a machine gun. A limited threat.

Best: M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

Train (Engine, Coal Car, Flatbed Car, Tank Car, Box Car)

Unarmed. No threat.

Best: Cannon, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Truck (Cab or Trailer)

Unarmored vehicle, usually unarmed. No real threat.

Best: M261s, Cannon, Minipod

Worst: Sidearm, Stinger, Sidewinder, Penguin

2S6 30mm/SA 19 Self-Propelled AA Gun

Lightly armored antiaircraft vehicle, armed with radar-controlled cannons (2.5 km) and laser-guided missiles (8.0 km). A serious threat.

Best: Sidearm, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

ZSU-23(4) Shilka Self-Propelled AA Gun

Lightly armored antiaircraft vehicle, armed with radar-controlled cannons (2.5 km). A definite threat.

Best: Sidearm, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

ZSU-57(2) Self-Propelled AA Gun

Lightly armored antiaircraft vehicle, armed with optically controlled cannons (2.0 km). A definite threat.

Best: Sidearm, M247s, TOW-2, both Hellfires, Helstreak

Worst: M255s, Minipod, Stinger, Sidewinder, Penguin

Structures

Airfield Control Tower

May be armed with an MG (1.5 km) or IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: Cannon, M247, TOW-2, both Hellfires, Helstreak

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Arched Bridge

Heavy rail bridge, not armed. No threat.

Best: M247s, TOW-2, both Hellfires, Maverick

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Barn

Small storage facility—may be armed with machine guns (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: M261s, Cannon, TOW-2, both Hellfires

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Billboard

Unarmed. No threat.

Best: Cannon, M261s, Minipod, TOW-2, both Hellfires

Worst: Minipod, Sidearm, Maverick, Penguin.

Building

Buildings may be armed with a machine gun (1.5 km) or IR-guided missiles of varying quality (4.5 to 8.0 km). A potential threat.

Best: M261, Cannon, Tow-2, both Hellfires

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Bunker

Fortified position, armed with cannons (2.0 km) and IR-guided missiles of excellent quality (8.0 km). A serious threat.

Best: M247s, both Hellfires, Maverick

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Crane

Oil refinery support equipment, usually unarmed. No real threat.

Best: M261s, Cannon

Worst: Sidearm, Stinger, Sidewinder, Penguin

Derrick

Unarmed oil production structure found at a refinery.

Best: M261s, Cannon, TOW-2, both Hellfires

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Hangar

Light metal structure—may be armed with machine guns (1.5 km) or IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: M261, Cannon, TOW-2, both Hellfires

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

House

Wooden structure—may be armed with machine guns (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: M261s, Cannon, Minipod

Worst: Sidearm, Stinger, Sidewinder, Penguin

Mosque

Unarmed structure. No threat.

Best: M261, Cannon, TOW-2, both Hellfires

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Oil Tank

Unarmed oil storage vessel. No threat.

Best: M247s, Cannon, TOW-2, both Hellfires

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Radar Tower

Airfield control tower—may be armed with machine guns (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: Cannon, M261s, TOW-2, Hellfire, Minipod

Worst: Stinger, Sidewinder, Penguin

Radar Site

Fixed radar site, usually unarmed. No real threat.

Best: Cannon, M261, TOW-2, both Hellfires

Worst: Minipod, Sidearm, Stinger, Sidewinder, Penguin

Rail Bridge

Heavy rail bridge, unarmed, no threat.

Best: M247, TOW-2, both Hellfires, Maverick

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Refinery

Oil processing building—may be armed with machine guns (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: M261s, Cannon, TOW-2, both Hellfires

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Road Bridge

Heavy road bridge, unarmed. No threat.

Best: M247, TOW-2, both Hellfires, Maverick

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

Tent

Small temporary storage facility—may be armed with machine guns (1.5 km) and IR-guided missiles of varying quality (4.5 to 7.0 km). A potential threat.

Best: M261s, Cannon, Minipod

Worst: Sidearm, Stinger, Sidewinder, Penguin

Tower

Large stone tower, unarmed. No threat.

Best: M247, TOW-2, both Hellfires, Maverick

Worst: M255, Minipod, Sidearm, Stinger, Sidewinder, Penguin

In The Air

Ka-34 Hokum Gunship Helicopter

Heavy gunship helicopter, armed with a cannon (2.0 km) and laser-guided missiles (8.0 km). A serious threat, not to be ignored.

Best: Sidewinder, Stinger, Helstreak, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

Mi-24W Hind-E Gunship Helicopter

Heavy gunship helicopter, armed with an MG (1.5 km) and good IR-guided missiles (7.0 km). A threat not to be ignored.

Best: Sidewinder, Stinger, Helstreak, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

Mi-28 Havoc Gunship Helicopter

Heavy gunship helicopter, armed with a cannon (2.0 km) and good IR-guided missiles (7.0 km). A threat not to be ignored.

Best: Sidewinder, Stinger, Helstreak, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

Mi-8TBK Hip-E Transport Helicopter

Heavy assault helicopter, armed with a machine gun (1.5 km) and usually with IR-guided missiles (7.0 km). A threat to be dealt with.

Best: Sidewinder, Stinger, Helstreak, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin.

Mig 23 ML Flogger-G Interceptor Aircraft

High-speed interceptor aircraft, armed with a cannon (2.0 km) and excellent IR-guided missiles (8.0 km). A very serious threat.

Best: Sidewinder, Stinger, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

Mig 29L Fulcrum-A All-Weather Fighter

High-speed, high-performance interceptor aircraft, armed with a cannon (2.0 km) and excellent IR-guided missiles (8.0 km). A very serious threat.

Best: Sidewinder, Stinger, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

SA-342 Gazelle Utility Helicopter

Light general-purpose helicopter, armed with IR-guided missiles (7.0 km). A threat to be dealt with.

Best: Sidewinder, Stinger, Helstreak, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

Su-25K Frogfoot—A Close Support Aircraft

Heavy ground attack aircraft, armed with a cannon (2.0 km) and possibly IR-guided missiles (8.0 km). A serious threat.

Best: Sidewinder, Stinger, Cannon

Worst: Minipod, Sidearm, Maverick, Penguin

On The Sea

Matka Guided Missile Patrol Boat

Naval patrol craft, armed with radar-controlled cannons (2.0 km) and IR-guided missiles of good quality (8.0 km). A definite threat.

Best: Penguin, Maverick, M247s, both Hellfires

Worst: M255s, Minipod, Stinger, Sidewinder

Osa-II Guided-Missile Patrol Boat

Naval patrol craft, armed with optically controlled cannons (2.0 km) and IR-guided missiles of good quality (7.0 km). A definite threat.

Best: Penguin, Maverick, M247s, both Hellfires

Worst: M255s, Minipod, Sidearm, Stinger, Sidewinder

T4 Landing Craft

Naval transport craft, usually armed with machine guns (1.5 km) and IR-guided missiles of average quality (7.0 km). A potential threat.

Best: Penguin, Maverick, M247s, TOW-2, both Hellfires

Worst: M255s, Minipod, Stinger, Sidewinder

Glossary

AA: Antiaircraft. Guns designed to shoot down aircraft.

AAA: Antiaircraft artillery; also referred to as "triple-A." Used mostly to refer to heavy AA guns, but generally synonymous with AA.

AAM: Air-to-air missile.

ADF: Automatic direction finding. A device to home in on transmitted navigational signals.

AFCS: Automatic flight control system. This device provides the control mechanisms for the autopilot and auto-hover systems.

Aft: Alternate term for "after" or "behind," originally nautical.

AFV: Armored fighting vehicle. Armored vehicle designed for front-line combat.

AGM: Air-to-ground missiles such as the AGM-114A Hellfire. Standard U.S. Army laser-homing armor-piercing missile.

AH: U.S. designation for attack helicopters. Examples are the AH-64 Apache and AH-66 Comanche.

AIM: Air intercept missile.

APC: Armored personnel carrier. A tracked or wheeled vehicle that transports an infantry squad. Most carry machine-gun-type weapons.

APR-39: Lightweight digital threat warning system. Designed for use on helicopters and light fixed-wing aircraft. Optimized for NOE flight.

APU: Auxiliary power unit.

ATGM: Anti-tank guided missile. A powered missile guided by wire, infrared, or laser-transmitted commands. The TOW-2 and the Hellfire are ATGMs.

AUX Power Unit: Auxiliary power unit. Small onboard turbine engine used to provide power to start the main engines.

Avionics: All electronic equipment that either informs a pilot about his aircraft or helps him control it.

Ballistics: The study of projectile performance, i.e., the science of how and why bullets and shells fly through the air.

Battalion: A military organization consisting of two or more companies. Cavalry or helicopter battalions are often called Squadrons. A battalion typically contains 500 to 1,500 men.

Bearing: The direction of a particular target or waypoint.

BMP: Bronevaya Maschina Piekhota. Soviet-built IFV.

BRDM: Bronevaya Razvedyvatelnaya Dozornaya Maschina. Soviet-built reconnaissance vehicle.

Brigade: In the U.S. Army, a military organization consisting of two or more battalions. It typically contains 3,000 to 6,000 men.

BTR: Bronetransportr. Soviet-built wheeled APC.

Bunker: A fortification to protect ground troops and weapons. Generally has very thick sides and roof, made of earth, concrete, and/or steel.

C&C: Command and Control

Ceiling: The maximum altitude at which an aircraft can safely fly.

CBU: Cluster bomb unit. A bomb that bursts into many smaller bomblets; used to cover a wide area.

Chaff: Radar decoy. Composed of thousands of different-sized metal film strips. Produces deceptive radar reflections.

CM: Countermeasures, such as jammers and decoys.

CO: Commanding officer.

Collective: Helicopter flight control used to "collectively" change the pitch of the main rotor blades.

Commo: Communications.

Company: A military organization consisting of two or more platoons. Cavalry or helicopter companies are often called "troops." A company typically has 100 to 300 men.

CP/G: Co-pilot/gunner. The "front-seater" in helicopters with tandem seating ("rear-seater" in the Comanche). The CP/G sits on the left in helicopters with side-by-side seating.

CRT: Cathode ray tube. Generic term for any TV and/or computer display screen.

Cyclic: Helicopter flight control used to selectively change the pitch of the main rotor blades.

Ditch: To perform a crash landing.

FARP: Forward arming and refueling point. A highly mobile helicopter base, normally airlifted by heavy transport helicopters.

Fast Movers: Slang term for conventional jet aircraft.

FFAR: Folding fin aerial rocket.

Flak: Nickname for antiaircraft guns or their exploding shells, derived from the German word for *antiaircraft gun.*

Flare: A cartridge-shaped source of intense heat energy. Normally launched in groups of three cartridges, each with a different heat frequency.

FLIR: Forward-looking infrared. Sighting device that "reads" the heat signature of objects.

FLOT: Forward line, own troops. Current designation for the line closest to the enemy.

Flying a Desk: A staff or command job with no flight duties.

Fore: Alternate term for "forward" or "ahead," originally nautical.

GPS: Global position system. Satellite-based navigation system.

Heading: The compass direction in which a vehicle is facing.

HEAT: High-explosive, anti-tank. A type of warhead designed to punch through steel armor. Fitted on most ATGMs.

Heavy Section: Helicopter flight group composed of three helicopters.

HEDP: High-Explosive Dual-Purpose. A type of high-explosive ammunition with an armor penetrating capability.

Hellfire: Nickname for the AGM-114A air-to-ground missile.

Hind: NATO code name for the Russian-built Mi-24 series of helicopters.

HQ: Headquarters.

HUD: Head-up display. A piece of glass mounted on the front of the cockpit, arranged so the pilot can look forward through the glass. Important combat and flight information is reflected off the HUD. The images are superimposed over the outside world so the pilot can look through the HUD and see the images at the same time.

HVM: High-velocity missile.

ICS: Internal communication system. Used for communication within a helicopter.

IFV: Infantry fighting vehicle. A tracked vehicle that transports an infantry squad. Usually armed with small-caliber cannons.

IHADSS: Integrated helmet and display sighting sub-system. Pilot's and gunner's helmet that includes position sensors and display monocle.

In Constraints: Term used to describe when a weapon is within its maximum range and target envelope.

INS: Inertial navigation system. A device that tracks a helicopter's current position and desired destinations.

IR: Infrared. A portion of the electromagnetic spectrum where the intensity of the signal is related to its heat signature.

ITV: Improved TOW vehicle. The current U.S. TOW platform is the M901.

Jammer: A source of intense infrared or radar energy used to confuse weapon systems.

Ka: Designation for helicopters designed by the Soviet Kamov Bureau.

Klick: Kilometer.

Knot: A measure of horizontal speed, equal to 1.14 miles per hour.

LGB: Laser-guided bomb. A bomb guided by reflected laser energy.

LHX: Light Helicopter Experimental.

Light Section: Helicopter flight group composed of two helicopters.

LZ: Landing zone.

Mask/Unmask: Terms used to describe the use of naturally occurring objects as cover.

MBT: Main battle tank. A general term for medium and heavy tanks.

MEDVAC: Medical evacuation. The transport of wounded troops.

MFD: Multi-function display.

MG: Machine gun.

MIA: Missing in action.

Mi: The designation for helicopters designed by the Soviet Mil bureau.

MiG: Aircraft designed by the Mikoyan-Gurevich Bureau.

MPSM: Multi-purpose submunition. A type of new Hydra 70 rocket system for helicopters. (Each M261 rocket has nine bomblets, or submunitions, each with its own explosive charge.)

MRLS: Multiple rocket launching system. The newest Western artillery rocket system.

NATO: North American Treaty Organization. A mutual defense treaty that includes 16 nations, all European except the United States and Canada. NATO is important to the Central European Front, because it forms the basis whereby U.S., British, and Canadian forces are stationed in Germany.

NOE: Nap-of-the-earth flying. Flying at an altitude of less than 200 ft., using the natural terrain for cover, to avoid enemy radar.

OH: U.S. designation for an observation helicopter, such as the OH-58D Kiowa Warrior.

Passage Point: Safe, no-fire area for flight through friendly troops.

Platoon: The military organization subordinate to a company. A platoon typically has 25 to 50 men.

Port: Left side of a craft; originally nautical.

POW: Prisoner of war.

Primary: The most important target of a mission.

Pull Pitch: To quickly add collective.

RDF: Rapid deployment force. A U.S. military force composed of "quick-move" military formations. Intended to be used as a timely response to "hot spots" around the world.

Reticle: A small circular "monocle" positioned over the right eye. The reticle reflects important combat and flight information, not unlike the HUD. The images are superimposed over the outside world; the pilot can look in any direction without losing sight of the images.

S-2: Battalion-level intelligence officer. He finds and summarizes all information about the enemy.

SAM: Surface-to-air missile.

SEAD: Suppression of enemy air defenses. A term used to describe a mission to destroy enemy air defense units.

Secondary: A target of lesser importance than the primary.

Sidewinder: Official nickname for the AIM-9 air intercept missile.

Skid: Sideways motion of a helicopter.

SOP: Standard operating procedure. Doing it "by the book," or according to the operating manual.

SSM: Surface-to-surface missile.

Starboard: Right side of a craft; originally nautical.

Stinger: Lightweight all-aspect heat-seeking missile for use against low-flying air threats.

Su: Soviet designation for aircraft designed by the Sukhoi bureau.

TADS: Target acquisition and designation system. A device mounted on Apache helicopters, used to lock onto targets and to control the laser designator.

TF: Task force. A battalion- or squadron-sized combat formation composed of mixed combat elements.

Thermal Imager: Similar to a FLIR, but "tuned" to objects more than to structures.

TOC: Tactical operations center. A small command tent, usually set up in the field.

Torque: Rotational force in a turbine engine.

TOW: Tube-launched, optically tracked, wire-guided.

Translational Lift: Lift caused by the motion of the entire helicopter, as opposed to lift caused by blades within the rotor.

UH: U.S. designation for utility helicopters such as the UH-60K/L Blackhawk.

Visiononics: A collective term used to describe all helicopter-mounted sighting devices.

VOR: VHF omnidirectional range. A radio beacon used for navigation.

VSI: Vertical speed indicator.

Warsaw Pact: Formed as a counter to NATO, it was originally composed of seven Eastern European nations. Formerly a purely military organization dominated by the former Soviet Union, it has now dissolved into a loose political group.

Waypoint: An interim navigation point used in conjunction with the INS.

Weapons Free: A term used to describe full freedom to use weapons against targets.

ZSU: Zenitnaia Samokhodnaia Ustanovka. Self-propelled antiaircraft mount; Russian armored vehicle armed with antiaircraft guns. Popularly known as a "Zoo."

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Index

A

Abdul Aziz, Sultan bin, 15
AGM-114A Hellfire missiles. *See* Hellfire missiles
AGM-65D Mavericks, 5, 53-54, 197
AH-6G Defenders. *See* Defenders
AH-64 Apache helicopters. *See* Apache helicopters
AH-1W SuperCobra. *See* SuperCobra
Aided Target Detection and Classification (ATD/C) system, 33
AIM-9L Sidewinder missiles, 5
Airborne target hand-off subsystem (ATHS), 24
Airfield Control Tower, 204
Air Medal for Valor, 155
Airspeed
  level flight and, 46-47
  time and, 60-61
Air targets, 207-209
Al Jabr airfield, 11
Ambush at tunnel or canyon, 62
AML-90, 199
Animals, hunting for, 171
Antarctica
  creation of theater, 176-177
  Islands & Ice Mission Builder, 163-167
  strategies for, 177-178
  stunt flying in, 169
  target point data, 160-162
Anticipating tactics, 67-68
Anti-torque rotor, 78-79
Apaches, 16-22. *See also* Hellfire missiles
  Longbow Apache gunship, 20-22
  in Persian Gulf War, 9-10
  specification for, 18
  system status indicators on, 44-45
  types of, 17-22
APCs, 52
Apocalypse MPS, 164
Apple II, 5, 6
Arched Bridge, 204
Army Commendation Medal, 155
ASI, 44
Atari 520 ST, 5

Atari 800 X/XE, 5, 6
Atari 1040 ST, 5
A-10 Thunderbolt Warthogs, 9
Auto-hover, 72-73
Autopilot, 60
Autorotation, 79-80

B

Back Alley, 164
Barns, 204
Barometric altimeter, 44
Battle of Khafji, 164
BBS, swapping missions on, 166
BGM-71D TOW-2 air-to-ground missiles, 5, 53-54, 197
Billboards, 204
  search for, 171
Black Hawks, 13, 14, 29-33
BMP-1 Infantry Fighting Vehicle, 199
BMP-2 Infantry Fighting Vehicle, 199
Boats
  Matka Guided-Missile Patrol Boat, 209
  Osa-II Guided-Missile Patrol Boat, 209
  T4 Landing Craft, 209
Bond, David, 21
B RDM-2 Recon Vehicle, 199
Bridges
  Arched Bridge, 204
  flying under, 168
  rail bridges, 206
  road bridges, 207
Bronze Star for Valor, 155
BTR-60/70/80 Armored Personnel Carrier, 200
Bug fixes in upgrades, 194, 195-196
Buildings
  flying under, 168-169
  as target, 204
Bulletin boards, swapping missions on, 166
Bunkers, 205

C

Campaigns, 150-151
Canyons for undercover flying, 61
Carriers, navigation with, 63
Cayuse, 25
Central Europe
  scoring in, 185
  target point data, 157-160
Chaff and flares
  and IR-guided missiles, 76
  and radar-guided missiles, 76
  readout on, 44
  weight and, 55
Chain gun, 77
Collective, 39
  losing altitude with, 181-182
  use of, 40
Collective Up Fast key combination, 46-47
Collision avoidance, 60
Comanches, 33-35
Combat tactics. *See* Strategies and tactics
Commanding missions. *See* Multi-helicopter missions
Commodore Amiga, 5
Commodore 64, 6
Compass, 44

CompuServe, 97, 166
Control configuration, 39-40
Countermeasures, 75-76
Cows, hunting for, 171
Crack enemies, 155
Cranes, 205
Cyclic, 39
  heavy hand on, 41
  use of, 40

D

Damaged helicopters, 119
Day, Jim, 6, 26, 45, 154, 164, 170
  interview with, 173-191
Decorations, scoring for, 154-155
Decoys, 76
Deep strikes, 132-139
Defenders, 24-25
Deliberation, 69-70
Delphi, 166
Deluxe Paint, 92
Dennies, Darrell, 5, 6, 45
  interview with, 173-191
Derricks, 205
Designing missions, 164-165
Disappearing helicopters, 171-172
Distinguished Service Cross, 155
Dual-joystick configuration, 39-40

E

Easy flight mode, 6, 45
Edit option, 165
EE-9 Reconnaissance Vehicle, 200
EE-11 Urutu Armored Personnel Carrier, 200
Electronic Battlefield, The, 4
Eliminating enemy units, 70-71
Elite enemies
  decorations and, 155
  for training flight, 84-85
Emergency tactics, 78-79
  autorotation, 79-80
Enemy aircraft, 76-78
Engine gauges, 44
Europe. *See* Central Europe
Evaluating information, 68-69
Evasive flying, 76
Export feature, 165

F

FARP
  scouting battle area and, 54
  weight and refueling at, 55
Fast forwarding mission films, 92
FFAR rockets, 5
Final score, 156
Finding the enemy, 63-65
Flares. *See* Chaff and flares
Flight leader, promotion to, 116
Flight school, 39-47
  level flight, 46-47
  stunt flying, 167-169
  training flight, 81-90
FLIR component, 13
Forward-looking infrared (FLIR) component, 13
Frozen Grave, 164

Fuel
gauge, 44
low fuel warning, 65

G

Gattling Gun, 23
Gauges and indicators, 42-43
Gazelles, 14-15, 208
avoidance of, 77
General Electric Universal Turret system, 23
GEnie, 166
German release of *Gunship 2000*, 171
Glossary, 211-218
Goddard, Don, 164
GPS map, 58
for training flight, 85
GPU-2/A Gun Pod, 198
Graphics screens, saving of, 92
Ground force targets, 199-203

H

Haire, Michael, 5
Hangars, 205
Helicopter carriers, navigation with, 63
Hellfire missiles, 52, 197. *See also* Apaches
against helicopters, 77
improved millimeter-wave Hellfires, 6
MMW Hellfires, 20-21, 51-52
for original *Gunship*, 5
in Persian Gulf, 7-16
ripple-fire, 71-72
Helstreak missiles, 5, 51-52, 197
against helicopters, 77
Hendrick, Arnold, 5
Hewish, Chris, 164
Hills
flying close to, 62
on training flight, 88-89
Hollis, Andy, 5
Hot spot, 169-170
Houses, 205
Hover infrared suppressor system (HIRSS), 30
Hueys, 29-30
Hunting, 170-171
Hussein, Saddam, 11
Hydra 70 rockets, 52, 197
launching of, 53
tactics with, 73-75

I

IBM PC, PCjr, XT, AT, 5
Infantry Squad, 200
INS pip, 60
Interview with creators of *Gunship 2000*, 173-191
IR jammers, 75-76
IR warnings, 75-76
Islands & Ice Mission Builder, 163-167

J

JetRanger. *See* Kiowa Warriors
Joysticks
dual-joystick configuration, 39-40
types of, 41-42

K

Ka-34 Hokum Gunship Helicopter, 77, 207
Kaufman, Doug, 276
Kiowa Warriors, 12, 26-29
  in Persian Gulf War, 11-12, 13

L

Landing craft, 209
Laser ranger/designator, 24
Level flight, 46-47
Line in the Snow, 164
Longbow Apache gunship, 20-22
Losing helicopters, 184-185
Low fuel warning, 65

M

M-247, 52
M-255, 52
Mahan, Michelle, 5
Marine Air Ground Task Force (MAGTF), 23
Marvicsin, Dennis J., 16-17
Mast-mounted sight, 72-73
Matka Guided Missile Patrol Boat, 209
Maverick, 16-17
Mavericks, 5, 53-54, 197
Medal of Honor, 155
Meier, Sid, 5
MH-53E Sea Dragons, 13
Mi-24W Hind-E Gunship Helicopter, 77, 207
Mi-28 Havoc Gunship Helicopter, 77, 208
MicroProse, BBS operated by, 166
Mi-8 Hips, 77
Mi-8TBK Hip-E Transport Helicopter, 208
Mig 23 ML Flogger-G Interceptor Aircraft, 208
Mig 29L Fulcrum-A All-Weather Fighter, 208
MiGs, 77
Missile View, 73
Mission Builder
  disk, 56
  Islands & Ice, 163-167
  mission films edited with, 97
  prototype of, 186-189
Mission films, 91-97
  exporting films, 165
  resuming control during, 95
  scoring system and, 96
Mission maps, 56-58
Mission orders, 48-49
  deep strikes, 132-133
  point attack missions
    multi-helicopter missions, 120
    single-helicopter missions, 102
  recon missions, 145-146
  search and destroy missions
    multi-helicopter missions, 126-127
    single-helicopter missions, 110
  search and rescue missions, 140
  tactical support missions, 140
  for training flight, 82-83
Mission recorder. *See* Mission films
MMW Hellfires, 20-21, 51-52
Mobile Scud Missile Launcher, 200
MOP (Magnetic Orange Pipe), 13

Mosques, 206
M-255 rockets against helicopters, 77
M-261s, 52-53
MT-LB Armored Personnel Carrier, 201
Multi-helicopter missions, 116-119
  campaigns, 150-151
  deep strikes, 132-139
  point attack missions, 119-126
  recon missions, 145-150
  search and destroy missions, 126-131
  search and rescue missions, 139-145
  tactical support missions, 139-145

N

National Defense Service Medal, 81
Navigation, 56-65
  finding the enemy, 63-65
  return to base, 63
  time and, 60-61
  undercover flying, 61-62
  waypoints, 59-60
Negative scores, 172-173
Nicholas, 12
Night targeting system (NTS), 24
Nintendo games, 175

O

Oceans
  navigation on, 63
  targets on, 209
OH-6A Cayuse, 25
OH-58D Kiowa Warriors. *See* Kiowa Warriors
Oil tanks, 206
Operation Desert Storm, 7-16
Operation Prime Chance, 11
Original *Gunship*, 3-7
Osa-II Guided-Missile Patrol Boat, 209
Osborn, Dave, 164

P

PC-Link, 166
Pedals for tail rotor, 39-40, 180-181
Penguin-3 Anti-ship missiles, 5, 197
Penguins, hunting for, 171
Persian Gulf, 7-16
  target point data, 157-160
  training flight in, 81-90
Peterke, Detmar, 6
  interview with, 173-191
Philippines
  creation of theater, 176-177
  Islands & Ice Mission Builder, 163-167
  target point data, 160-162
Point attack missions
  multi-helicopter missions, 119-126
  single-helicopter missions, 101-110
Pong, 170
Primary targets for training flight, 87
Processing speed for *Gunship 2000*, 42
Prodigy, 166
Promotions, 153-154
  to 2nd Lieutenant, 116
Purple Heart, 155

Q

Quitting, 80

R

Radar
  altimeter, 43
  countermeasures with, 75
  jammers, 75-76
  sites, 206
  towers, 206
Radome, 20
RAH-66A Comanches, 33-35
Rail bridges, 206
Rail tunnels
  flying through, 167, 175-176
  undercover flying, 61-62
Rain of Terror, 164
Ranks, 81
Raw score, 156
Realistic flight mode, 6, 45
  rolling helicopters in, 178-180
Recon missions, 145-150
Recover Previous Duty Roster option, 165
Red system status indicator, 44-45
Refineries, 206
Regional deployments, 6
Replaying mission films, 91-97
Resumed Score, 95
Return to base, 63
  low fuel warning, 65
Reverse Tactical View, 73
Ripple-fire, 71-72, 181-182
Rivers, undercover flying on, 61
Road bridges, 207
Rockets, 73-75. *See* Hydra 70 rockets
  M-255 rockets against helicopters, 77
Rolling helicopters, 169, 175-176
  flight mode for, 178-180
Russell, Lawrence, 164

S

SA-3 Goa Low/Medium Altitude SAM system, 201
SA-6 Gainful Self-Propelled SAM Vehicle, 201
SA-9 Gaskin Self-Propelled SAM Vehicle, 201
SA-11 Gadfly Self-Propelled SAM Vehicle, 201
SA-13 Gopher Self-Propelled SAM Vehicle, 202
SA-342 Gazelles. *See* Gazelles
Salvo settings, 73-75
SAMS
  SA-3 Goa Low/Medium Altitude SAM system, 201
  SA-6 Gainful Self-Propelled SAM Vehicle, 201
  SA-9 Gaskin Self-Propelled SAM Vehicle, 201
  SA-11 Gadfly Self-Propelled SAM Vehicle, 201
  SA-13 Gopher Self-Propelled SAM Vehicle, 202
  self-propelled, 52
Saving information, 92
  exporting of saved missions, 165
Scoring
  decoration criteria, 154-155
  final score, 156
  gauging scoring, 183-184
  mission films and, 96
  negative scores, 172-173
  promotion criteria, 154
  raw score, 156
  target point data, 157-162
Scouting battle area, 54

Screen capture utility, 92
SCUD in Your Eye, 164
Scuds
  Mobile Scud Missile Launcher, 200
  on training flight, 88-90
SeaCobra in Persian Gulf War, 11
Sea Dragons, 13
Search and destroy missions
  multi-helicopter missions, 126-131
  single-helicopter missions, 110-116
Search and rescue missions, 139-145
Seas. *See* Oceans
Secondary targets in training flight, 88-90
2nd Lieutenant, promotion to, 116
Secret enemy installations
  locating, 64
Ships. *See* Boats
Sidearms, 5
  features of, 70
Sidewinders, 197
  for fighter jets, 77
Silver Star, 155
Single-helicopter missions, 100-101
  point attack missions, 101-110
  search and destroy missions, 110-116
Soviet Union, disintegration of, 7
S-2 reports, 48, 49
  for training flight, 82-83
Stealey, Bill, 3
Stingers, 5, 197
  for fighter jets, 77
Strategies and tactics, 66-80
  countermeasures, 75-76
  in emergencies, 78-79
  mast-mounted sight, 72-73
  mission films and, 96-97
  ripple-fire, 71-72
Structure targets, 204-207
Stunt flying, 167-169
Su-25K Frogfoots, 77, 209
Summary text files, 166
SuperCobra, 10, 22-24
  in Persian Gulf War, 11
SUU-11BA Minigun POD, 198
Swapping missions, 166

T

Tactical support missions, 139-145
Tactics. *See* Strategies and tactics
Tail rotor, 39-40
  damage to, 78
  function of, 40-41
  and mast-mounted sight, 72-73
  pedals for, 180-181
Tail rotor indicator (TAL), 45
T4 Landing Craft, 209
Tank Truck, 202
Target acquisition and designation system (TADS), 20
Target point data, 157-162
Targets, table of, 199-209
Tavares, Gregg, 5
T-55M1 Main Battle Tank, 89-90, 202
T-62E Main Battle Tank, 202
T-80 Main Battle Tank, 203
T-72M1 Main Battle Tank, 202
Tents, 207
30mm chain gun, 5

Thomas, Vaughn, 164
Threat display, 44
  enemy aircraft on, 77
386-based PCs, 7
Towed Gun, 202
Towers, 207
TOW-2s, 5, 53-54, 197
TPW fire controls, 24
Train, Tim, 164
Trains, 203
Tripoli, 13-14
Trucks, 203
Tank Truck, 202
2S6 30mm/SA 19 Self-Propelled AA Gun, 203

U

UH-1 Iroquois Transport Helicopters, 29-30
UH-60 Black Hawks. *See* Black Hawks
Undercover flying, 61-62
Upgrades. *See also* Mission Builder
  table showing, 193-196
U.S.S. Curts, 13

V

VCR, recording missions on, 91
Vehicle targets, 199-203
Videotaping missions. *See* Mission films
VSI (vertical speed indicator), 43

W

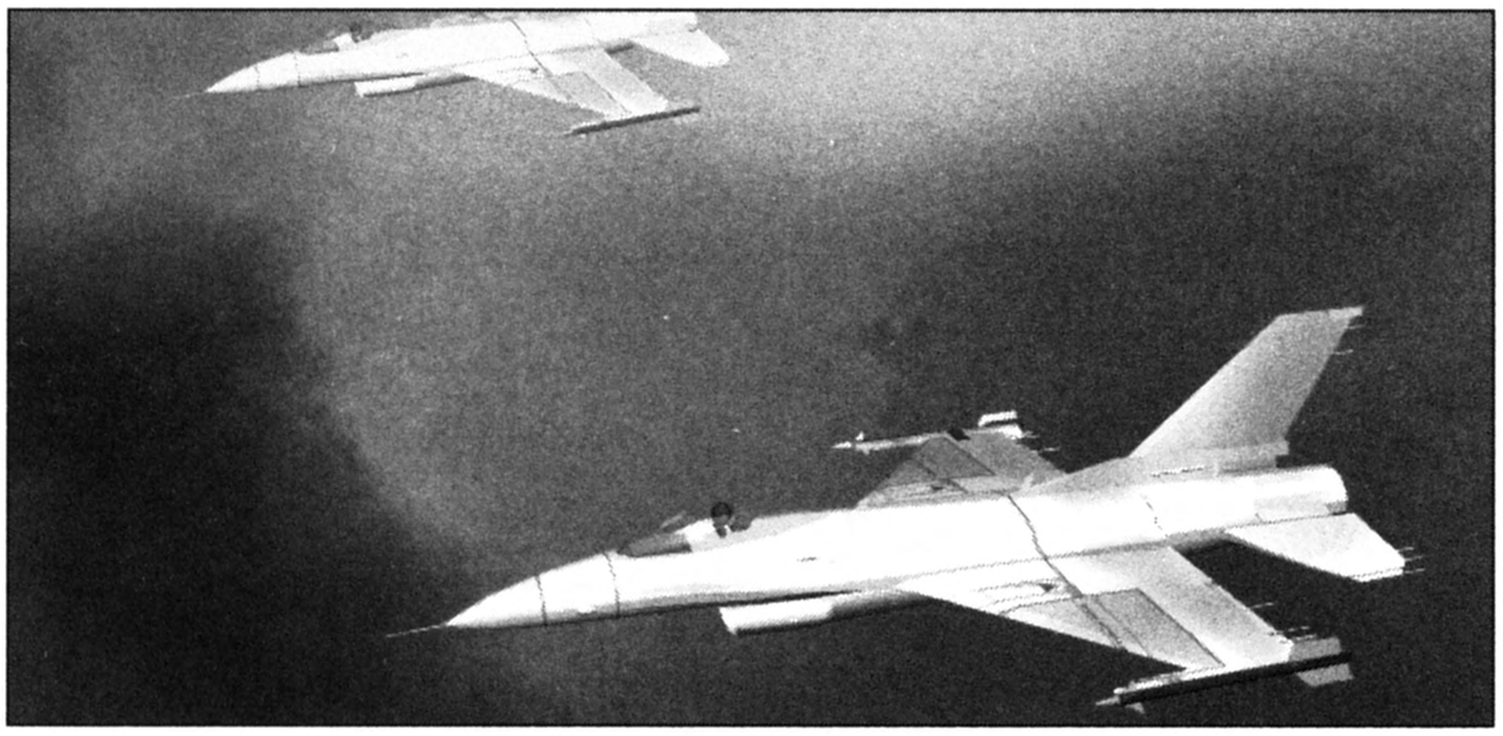
Warnings, 43
  low fuel, 65
Warrant Officer Candidate, 81
Water buffalo, hunting for, 171
Waypoints, 59-60
  in training flight, 87
Weapons
  anticipating uses of, 67-68
  and autorotation, 79-80
  best weapons for target, 50
  for multi-helicopter flights, 55-56
  selection of, 17-56
  table of, 197-198
  for training flight, 84
Weapons bay doors, 46-47
Weight on chopper, 54-55
Whiskey. *See* SuperCobra

Y

Yellow system status indicator, 44-45

Z

Zsu-23(4) Shilka Self-Propelled AA Gun, 203
Zsu-57(2) Self-Propelled AA Gun, 203



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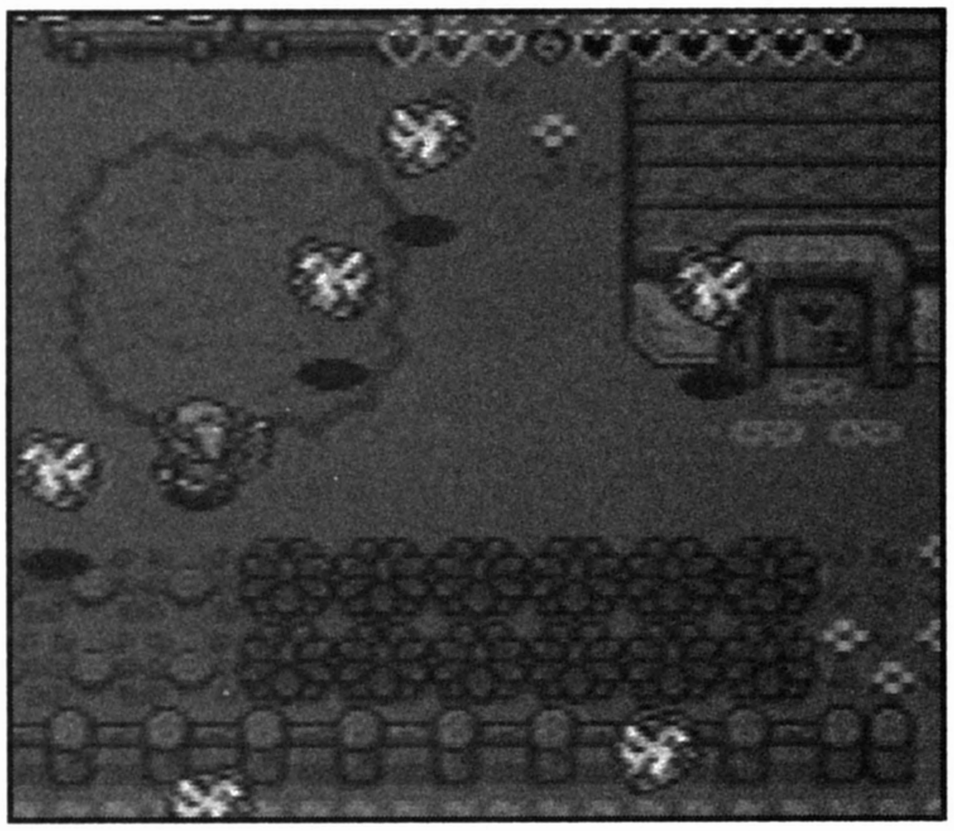
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