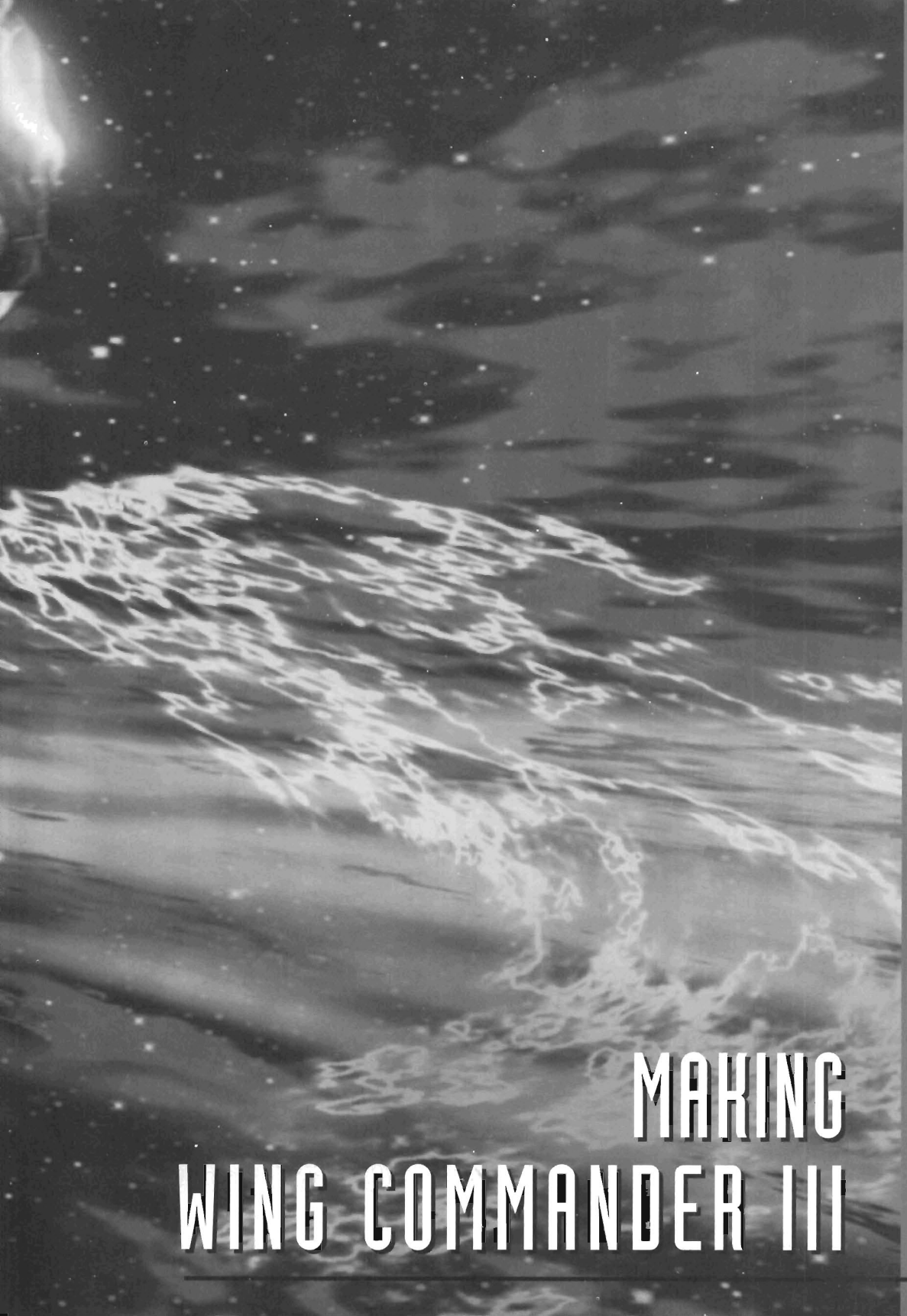


MAKING WING COMMANDER III

MAKING WING COMMANDER III

Stepping into the ORIGIN building is a bit like beginning a tour of Willy Wonka's Chocolate Factory. It looks charmingly peculiar with its brightly colored walls at odd angles, askew doorways and out-of-place columns. Glass cases in the bright, two-story lobby contain curios of past and future games: a World War II navigation map, a cyborg faceplate, an hourglass and magic talisman. There are even the skeletal remains of some long-forgotten guest still sitting in the "Waiting Room." Beneath it all, however, is an undercurrent of serious game-making.

The most "serious" undertaking to date was conceived, incubated and brought to light behind the dark purple maze of walls on the second floor. It is the third installment of the successful *Wing Commander* series.

If you were to walk from the lobby through the cafeteria, past the full bank of free arcade games (*Tron, Stargate, Defender, Joust, Robotron* and the always popular pinball machine), you'd find a short passageway that leads to a bright yellow, circular cul-de-sac. On one curving wall is the door to the stairs. One floor up and you enter into a hallway with walls tilted as though they were designed by a carnival architect. At the far end is a beverage bar with free-flowing coffee, hot chocolate and other forms of caffeine. That serves as the fueling station for the team that created ORIGIN's interactive space-flight adventure.

On the wall around the corner is a foam-board chronicle of the creation of *Wing III*, the project that cost over four million dollars, involved hundreds of people and spanned nearly two years in the making. Affixed to that board are examples of nearly every stage of the creation: from sketches to screenshots, from white and blue script pages to—the final goal—four shiny CDs.

This massive board holds examples from nearly every stage of the creation of Wing Commander III: from sketches to screenshots, from white and blue script pages to—the final goal—four shiny CDs.

HISTORY

IN THE BEGINNING

You could say it all started with little colored blocks moving around on a screen. Not a particularly dazzling onset for what would become perhaps the most popular science-fiction flight adventure ever to hit the computer game market, but not bad for a thirteen-year-old boy playing around with his friend's Sinclair ZX-80. Chris Roberts, living in Manchester, England, spent all his spare time discovering what the world of computers had to offer. The ZX-80 was one of the most popular computers in Britain then. It had about 1K of RAM, but that was enough to make blocky shapes that moved.

It didn't take Roberts long to realize he needed formal training to improve his skills. He took an extramural course that concentrated on how to create business programs and operating systems, but he was more interested in games. A world of entertainment opportunities beckoned to him through computers—that was the market that attracted Roberts.

He began to dabble in the world of games. In his spare time, he developed a few simple games in BASIC. They were simple enough to be typed directly into a computer and played —and good enough to be published in the *BBC Micro User*, a computer game magazine. Roberts was more than happy to sell his games to the magazine. Not only did it pay $200 for each game, which is more than most teenagers expect to receive for playing at their favorite hobby, but there was also the thrill of developing games "professionally."

His early games were elementary. His first was an arcade-style version of King Kong, complete with a giant gorilla and helicopters. His second was *Popeye*, another simple arcade-style game. But it wasn't long before Roberts found that BASIC was too restrictive for writing games. The graphics quality would always be limited, and the speed was never fast enough to suit him. The next step was to learn machine code.

During 1983 and 1984 he worked on the machine code for a simple action/adventure game called *Wizadore*. Unlike his previous games, in *Wizadore* the player could manipulate objects, cast spells, hurdle obstacles and fight valiantly against evil creatures. Imagine Software published *Wizadore* in 1985, and it went to number one in the *BBC MicroUser* charts.

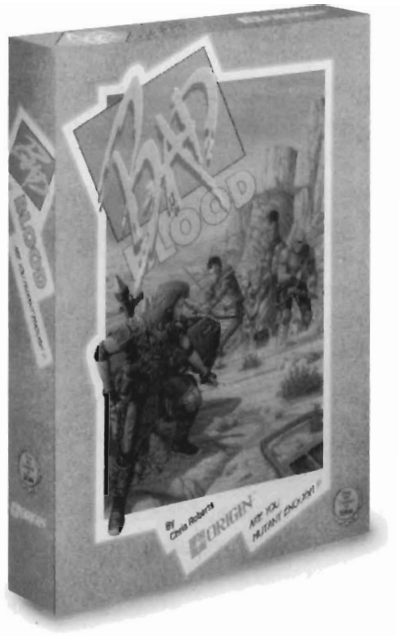
The next game in Roberts' programming evolution was another arcade adventure called *Stryker's Run*--a game that incorporated scrolling. The player could pick up objects, jump aboard helicopters and planes, blow up obstacles and more—all while moving across an area much larger than one screen. The graphics had been done by a an artist hired for the job, and were the best on the market. Similarly, he brought on Martin Galway, a friend from school, to create the musical background.

Stryker's Run far outsold any game that Roberts had previously designed. It was clearly time to break into a larger market. He decided to work with the Commodore, which was establishing a huge base in the entertainment market.

The first Commodore game Roberts began working on was *Ultra Realm*. It was different in that it used a split-screen display with a top-down perspective, and also included fully fleshed characterization, not to mention plenty of well-armed opposition and a compelling storyline.

ORIGIN

When *Ultra Realm* hit the shelves, it was under the name *Times of Lore*—and it was released by a young company named ORIGIN, situated in Austin, Texas. Other companies could have marketed the game, but Roberts and ORIGIN realized they worked well together.



Roberts, while visiting his parents in Austin, found a local artist, Denis Loubet, to work on his new game. Approximately two weeks later, Denis was hired to work for ORIGIN. That was the introduction. Roberts had never heard of ORIGIN—the new company had not established a reputation in Europe yet. However, when Denis showed Richard Garriott (ORIGIN's creative founder) and Dallas Snell (VP of Product Development) the game Roberts was working on, they became very interested in meeting him.

At the time there were only a handful of people working at ORIGIN. They were a high-energy group with an infectious attitude about the entertainment industry. Although Roberts had talked with several high-profile companies such as Electronic Arts and Bröderbund, he decided to let ORIGIN take on the distribution of *Times of Lore*. It was a welcome change after the high-pressure, big-business atmosphere in England.

PROCESS OF LEARNING

Not everything that Roberts touched turned to gold, however. After *Times of Lore* released he had several games on the drawing board. One was *Times of Lore II*, another was *Bad Blood*, and a game called *Squadron* was being sketched out. There was, however, the small problem of money.

Actually, the problem was lack of money. Designing three projects concurrently was not financially possible. ORIGIN chose to give *Bad Blood* precedence—not only would it be easier to complete, the theory went, but it would also make a certain time-slot that the company currently had empty. Unfortunately, *Bad Blood* took more resources than anyone had anticipated. It was late hitting the shelves and sold slowly. No one knew what to expect of it—the arcade-game players thought it was a kind of *Ultima*-style role-playing game, and the *Ultima* fans avoided it because it was an arcade game.

SQUADRON

As he was completing *Bad Blood*, Roberts was also starting work on *Squadron*. He decided on a three-dimensional, first-person perspective. Nothing else would carry the intensity that he desired. He wanted to go for the feel of a movie. To that end, he began experimenting with bit-mapped graphics.

It was the right decision. Bit-maps were images taken from a model and stored as a huge "shape file." That way the program only had to know what view to turn on, rather than to develop it new for every frame. It took a while to develop a method that took full advantage of bit-mapped images. Scaling was the largest hurdle. It was difficult to simultaneously rotate an image and scale it correctly.

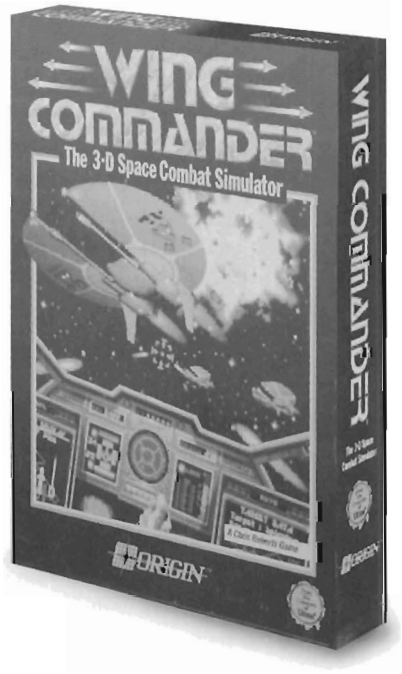
Finally, *Squadron* had developed to the point where a player could sit in a cockpit, fly around and shoot at the enemy — and Roberts decided it was time to show it to Fred Schmidt, ORIGIN's general manager, and Dallas Snell.

They all agreed the game looked good. Not only did the graphics carry a visual punch that was unusual in the industry, but it could introduce ORIGIN to a whole new section of the computer game market. *Squadron* was accepted as an ORIGIN product. Following a trademark search, the name was switched to *Wing Commander*.

WING COMMANDER

One of the things that impressed ORIGIN were the touches that appeared onscreen. From the hand on the cockpit joystick moving in time to the player's hand on the controls to the way the pilot's head "moved," *Wing Commander* drew the player not into a simulation of flying, but actually into the story itself.

A significant part of what made *Wing Commander* seem more real was not graphics, but the story. The character interaction and dynamic musical score were some of the many things that Roberts had always known he'd like to include in his games, but which the computers of previous years had never been able to handle. *Wing Commander* was the first game Roberts developed for an IBM-compatible PC audience capable of viewing 256-color VGA graphics. Moreover, ORIGIN decided that they could require 640K to run the game. Roberts took full advantage of the opportunities those specifications gave him. As it turned out, the final product of *Wing Commander* matched the vision that Roberts had conceived. In the computer industry, that is an outcome that's rarely realized.



THE HIT

The first sign that the game was going to be a hit came when they showed it at CES in Chicago, 1990. Developers and designers from other companies couldn't stay away from the fast, new 386 and large-screen monitor. The booth was packed until the show was over --and was the favorite subject for the duration. No one had expected such a great simulation-type game from ORIGIN. Everyone had thought ORIGIN was too small to manage it.

The next sign of success was when the playtesters started to work on the game. Professional game players, these testers were rarely impressed — *Wing Commander*, however, captured their attention. People were staying late, playing the game in their spare time. When the game shipped, sales took off far faster than expected. It was easy to see that fears about the market's perception of ORIGIN as an *Ultima*-only company were misplaced. *Wing Commander* made the charts --and stayed there far longer than anyone had predicted.

THE SAGA CONTINUES

Toward the end of the *Wing Commander* project, they began to prepare for a "special edition" of the game. Extra *Secret Missions* were designed and developed, mostly alongside the main project. Roberts likened it to other modular games, such as *Dungeons & Dragons* --a way to expand the adventure without having to purchase an entire new game. It was a good idea, and quickly grew into a second expansion. *Secret Missions 2* was created, and took the player down yet one more path in the war against the Kilrathi. The next stage was obvious: *Wing Commander II*.

The second installment of the *Wing Commander* series was produced by Chris Roberts, but was mostly directed and handled by Ellen Guon. He retained a certain amount of creative control in as much as he could say which direction the story should take, and which directions had the wrong "feel" to them. He discussed with Ellen Guon which storylines remained true to the overall *Wing Commander* universe, and which concepts were shaky. Always his basic measuring stick was "would I like to play this game — is it something that I would really enjoy?"

For *Wing Commander III*, though, he reclaimed his role of creator--only this time he guided not just the project, but the Hollywood production.

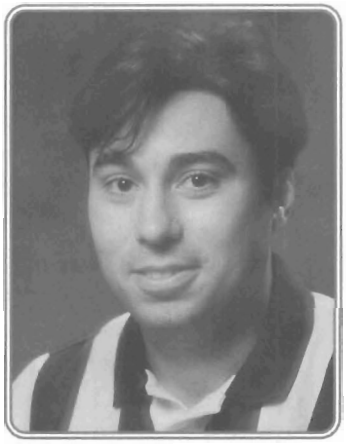
DESIGN

As much input and creativity as Chris Roberts invested in *Wing Commander III*, he could not have done it on his own. His designers and programmers worked long hours to produce the best gameflow and space flight conceivable. They are the unsung heroes. When a production is as ambitious and ground-breaking as *Wing III*, the nuts and bolts of the game itself can sometimes get lost behind all the Hollywood glamour. It can easily be forgotten that an Interactive Movie is not a movie, but a computer game.

The team Chris assembled was unusual. All highly skilled and enthusiastic, the most distinctive common denominator was that they were all *Wing Commander* fans long before they worked at ORIGIN. They were not introduced to the game in retrospect. No one had to write out a list of "this is what impressed the customers." They had been in the cockpits from the beginning of the epic adventure, and they were ready to make the game all they had ever hoped it could be.

ORIGINAL CONCEPT

CHRIS ROBERTS, DESIGNER/DIRECTOR/PRODUCER



The world of *Wing Commander* is a series of offices and cubicles behind an unadorned gray door set in a purple wall. The nameplate on the third door to the left reads simply "Chris Roberts," but an anonymous team-member has taped up a sign: PUSH BUTTON FOR INTERACTIVE.

Inside his office is a sprawling desk, some cushioned seats for visitors—and in the corner is a souvenir from the Los Angeles shoot, a canvas chair with his name and "Director" printed across the back. On the windowsill behind the desk are two angular, pale rocks. Chris picks one up and displays it. "This is the asteroid from *Wing Commander I*. We hung it by a string from the ceiling and bit-mapped it. We actually had a moon rock that we looked at, but this worked much better... and we just picked it up off the ground."

Q: What did you actually envision with *Wing Commander III*?

CR: The goal was to finish up the *Wing Commander* trilogy of fighting the Kilrathi. Plus, since we were going to CD-ROM format, we wanted to do a CD-ROM game right. The *Wing Commander* games have always been done that way—*Wing Commander I* was designed to use a 386 VJ properly. For the CD we decided to do an interactive movie with live action. Everyone's been talking about interactive movies, but we hadn't heard of anyone doing it right, so we wanted to go out and do it properly. With *Wing III* we tried to apply the production value to an interactive movie that we'd applied on the computer side with the previous *Wing Commanders*. The goal was, if someone said, "What's an interactive movie?" we'd just hand them the CDs from *Wing Commander III* and say, "Here, check this out."

Q: Are you happy with what you've got so far?

CR: Absolutely. As doesn't happen too often, but did happen with *Wing I*, I think the results we got were better than we felt we were going to get. That's always a good sign—when it exceeds our expectations.

Q: What was your perception of how *Wing I* hit the market? Do you think there's going to be a lot of parallels?

CR: I think *Wing I* came just as 386s started truly coming into the home, and as people really started buying VGA cards. Before that it was all 8086s or straight IBM PCs with 286 and VGA. We hit on the crest with sound cards and saw PCs becoming game machines—really powerful game machines. If you wanted to show your hot machine off back in 1990, *Wing I* was the game to do it. I think that right now we are in a phase where CD-ROM is becoming standard and everyone is getting a multi-media machine, but I don't really think the software is out there yet that truly shows it off. That's what I think *Wing III* is going to do.

Q: What are the major differences between *Wing I*, *II* and *III*?

CR: There are a bunch of them. First off, in space flight *Wing III* has real-time 3-D art instead of bit-map polygonal 3-D. Shape and texture are a lot smoother in space flight. We can also do Super VGA in space, as opposed to VGA, so there's a lot more detail and resolution. It's smoother and more detailed. We have a lot of "incremental features" out in space flight, you get more options in terms of the different controls you have. You can control your attitude levels, etc. Everything that the *Wing Commander* players have been asking for—for a long, long time—is in *Wing Commander III*...and then some.

On the story side, we have live action for the story-telling part of it. Instead of having the face of the character there and the words he's saying appearing below, we filmed actors playing out the scenes. We captured those shots and put them directly in the game, so that the whole storyline gives context and meaning to the space action in *Wing Commander*. In *Wing III*, the storyline is more engrossing — you have more of an emotional connection. There are real people on the screen, instead of just simple cartoon characters. That should move the game experience to the next level.

Script in hand, Chris Roberts and Malcolm McDowell thumb through an upcoming scene.

I think on both ends, space flight and the story side, there are significant differences between *Wing I* and *Wing II*. I would say that there is probably more of a jump between *Wing II* and *Wing III* than there was between *Wing I* and *Wing II*. But I think in its own way *Wing III* is probably as revolutionary as *Wing I* was.

Q: What were the difficulties with such a radical departure from the "simple cartoon characters" in *Wing II* to the way it was in *Wing III*?

CR: The biggest difficulty was the whole video side. No one here at ORIGIN had ever done anything like that. The computer game industry had never done anything to that scale. We didn't even have any technology for playing back the video on CD. So we had to do a lot of the story/movie side on blind faith and guesswork. We decided that we were going to try and get fresh-out-of-Hollywood screen writers to get the script ready. We knew we needed to try to do it out in L.A., and get it done right-- with well-known, good, established actors. We hadn't done it before, so it was a real learning experience.

The space flight/game side was a lot easier because basically we'd been working with that for a long time We'd been learning from our mistakes and improving on them, so we had that down pretty well. Basically we jumped into the movie industry and had to learn fast or sink. I would say that was probably the biggest challenge.

The other challenge was to get across the idea of how it was going to fit together. Everyone was kind of skeptical. "Oh, yeah, live action. That kind of thing sucks." We had to face attitudes like that. Still, I would say the video was probably the biggest challenge.

Q: Was *Wing III* something that grew in concept after you started working on it?

CR: No, I knew the story we were going to do on *Wing III* before we started. I designed the *Strike Commander* technology with *Wing Commander III* in mind, to do all the space flight. That's one reason the space flight stuff was easier for us. We just upgraded the Super VGA to make it faster. *Strike Commander* was developed so we could get the technology for *Wing III*. Since it went on a lot longer than I had anticipated, I had a lot of time to sit around and think about what I wanted to do on *Wing III* ... and how cool it was going to be. So I had thought out the storyline, the basic concept and everything in *Wing III*, long before we started.

Except for the video ... i only decided to go with video in it once we started creating *Wing III*, and so that stuff was new. I had a pretty good idea of how everything was going to be with the exception of using video instead of drawing characters.

Q: So you didn't have any surprises.

CR: Not really. It was just trying to beat the "vision" out into a game. That always takes some time. Luckily there weren't any surprises. The only surprise was that it turned out better than I thought. Things like the scriptwriters coming back with a better script than i expected. There were surprises on the up side, which is always nice to have.

Q: Comparing the actual sit-down-and-think-out design stage of *Wing I* and *Wing II*, to the design stage of *Wing III*, what changes were there in the way you designed the game?

CR: *Wing III* was designed much more up-front. I knew how *Wing III* was going to work before I started on it. I had also honed a lot of my ideas. My ideas on what makes this kind of game work had evolved, and so it was becoming more than just guesses. *Wing I* was just a whole bunch of ideas that we put down, saw how it worked together... it kind of grew as we went along. By the time we started *Wing III*—after *Wing I*, *II*, and *Strike Commander*—we had a good idea of what things were going to work. It was just a matter of designing it right.

Also, we were forced to plan everything out front before we did the movie shoot. Once you're shooting, you're committed and you can't change anything. So we needed to have everything in the game designed by about February. The script had to be finished. So from that date on, everything was just a matter of being finished and slotted into place. That's good, because it stops you from tinkering. With most computer games I've worked with in the past, it has always been that you're designing until the day before it ships. It's probably one of the biggest reasons why games slip: people play around and try to do different things. This time we were forced to commit to something we designed.

Q: You seem to be keeping on schedule.

CR: Yes! Amazing!

Q: What was the most interesting or fun part about creating *Wing III*?

CR: There were a lot of interesting and fun parts. It's great to come up with an idea and hand it out to a lot of really creative, bright and talented people and watch them come back with stuff that's cooler than you imagined. The sum is greater than the parts. That's one of the very cool aspects.

Personally, I think one of the best aspects was going out and directing the whole shoot ... and kind of putting it together. My biggest kick about computer games is that you take a picture in your head, and you get it onto a screen. Directing live action was a lot like that, but condensed. You'd start off with an idea of how a scene would go. In the morning you'd talk it over with the actors, you'd block the angles of the camera and shoot it, and the next day you'd be seeing a rough cut of the scene. Traditionally, with computer graphics, it would take a month before I'd see a rough cut. So for me it was a distillation of everything I liked in making computer games. Directing was a big rush. Movies and computer games are my two favorite things. If I weren't doing one I'd be doing the other.

Q: What differences did video bring to the game?

CR: I think it makes the game far more interesting. It makes you care about the story. I always liken it to the days when I played Infocom games... I used to love textual adventures. Then Sierra came out with graphic adventures and all the people liked graphic adventures. Now everyone playing adventure games has a new experience--they can see and interact with the world. Before, they had to imagine what was going on. Video just opened the audience up wider. The people who liked the adventure games in the old days still play the new ones, but now a whole bunch of new people who didn't used to play the old ones have come along because the experience is a little closer to what we are used to seeing on TV and movies. We have achieved the third stage: first text, then graphics and now CD-ROM. It makes the story much more compelling because it has real people, with real emotion. An actor can say something with a look that you can never really get across with text on a computer screen, with just a computer face there.

I think that really makes a difference. The story end of it really means something now. You'll be interested. You'll want to watch. You'll want to know what happens in the story. People will get into the story, and maybe they'll like or hate a certain wingman—they'll give a damn what happened to him out in space. That will make a big difference when you are fighting out in space. Your actions will have a real effect on the people back on the ship—and now these are real people that you talk to and associate with. That heightens the whole impact of the story.

Q: What difficulties did video production throw at you?

CR: It was just so new for us. Organization, new technology, everything... we hadn't done any of it before, so we had to learn fast. We had to talk to dozens of different people and find out what was the best way to do things—in their opinion--and judge those against what we heard from other people. Then there was just getting organized. Basically we shot over a hundred hours of footage and the end result was more than three hours of footage on the computer.

Backed by a full stage crew, Chris Roberts observes one of hundreds of takes that resulted in more than three hours of game footage.

All the scenes had to have computer sets and backdrops. That was such a vast amount of art that just having to organize the backgrounds with the footage was a real nightmare. Most movies have maybe five to ten percent special effects shots—where 100% of our shots were, in essence, special effects shots. Anyone on our staff who was working on the video side could get a job anywhere, organizing anything. We had to do an incredible amount of work on that end. Plus there was a lot of new equipment. The movie player wasn't fully running until a full month after we finished shooting. There was a lot of stuff like that. Everything worked out, but it was tough.

Q: Why did you assemble the particular team that you did?

CR: With Frank (Savage, the Game Development Director), it was pretty easy. Warren (Spector, Senior Producer) told me about him. "Yeah, we've got this guy up in Chicago whose license plate reads WNGCMD 1. We need to hire him to work on the next *Wing Commander*." So we brought him in on *Strike Commander*. He was just awesome on that. Frank was probably one of the biggest fans of *Wing Commander*, so for him to do *Wing Commander III* seemed really natural. He's definitely incredibly talented. Frank pretty much built the team up. All the programmers were Frank-picked and hired to work with him. He looked for programmers who were game players, who liked *Wing Commander* and who shared the same kind of vision.

We got Chris Douglas to be the Art Director, and it was the same kind of deal. He came in to do a bunch of the *Wing Commander II* art. He knew *Wing Commander* intimately and he has a really good artistic and stylistic look...kind of jagged. We found him working on *BioForge* and dragged him to *Wing Commander*, and he helped out immensely.

Then there's Martin Galway. I've known Martin for a long time. He did the sound background for *Times of Lore* and *Stryker's Run*... so he's a really good and organized at getting the job done. The rest of the people on the team I can't take credit for, because I really only pick the key people, and let them pick who they want to work with.

Q: *Wing I* had a lot of little touches that made it a different experience from all the other games out there. Are there any little touches in *Wing III* that make it competitive?

CR: There are a lot of similar touches in *Wing III*. I don't know if people just expect them now, because *Wing I* did them and now everyone does them, too. As far as I'm concerned, each little thing you do that pulls you into the screen and makes you feel like you are there ... anything that helps you suspend disbelief when you want to do it, that's what we tried to include. In *Wing Commander III* we position our "cameras" in the cockpits. Your MFDs break. You have little sparks when you cut something. Everything is richer than it was in *Wing Commander I*. We still have the scramble takeoff sequence, but it's got far more to it than *Wing Commander I* had.

It's tough for me to put my finger on any one "touch." I think the most I'll say is that we applied a movie production value to every single scene, no matter how small or unimportant it was, so everything had the same production value from start to finish. Usually on a computer game the intro looks really good and the end sometimes looks good, but what's in between doesn't get near the attention that the intro got. We gave the same priority to everything. We filmed everything back-to-back so each little scene has the same production value that the opening and the end do. Which is really cool, actually. People will play the game just to lose so they can see what the losing endgame looks like. That has some animation that's just as good as the winning track, which is very unusual for a game. So I would say that is probably the biggest thing that people will notice. Just the attention to detail everywhere.

Q: This is the third game of the trilogy. How long have you known how it would all wrap up?

CR: I think since the second one. During the first one I really wasn't thinking about doing a trilogy. But after the success of the *Wing I* everyone clamored for a sequel. So we did *II*, but I was thinking that I wanted to finish it, and finish it right. While I was thinking it over I formulated what I wanted to do with it. During the course of *Strike Commander* I cleared up all the ideas. So I would say back in *Wing II* and *Strike Commander* was when I knew.

Q: What other elements in the game, besides the video, do you feel carry a lot of the impact of the game?

CR: Well, there's no question that the space flight also looks great. Everyone went to great pains to make sure the space flight was like the video. I haven't seen any other game, even in Super VGA, with this level of detail. Especially out in space. Our ships--you can fly inside and outside huge capital ships. We don't even need to put video in this game. It could just have been space flight and it would be seen as being the best *Wing Commander* yet. I think people will be getting a huge bargain. This is typical ORIGIN style, where we say, "Nevermind what we need to do. Let's just do the biggest, baddest thing we possibly can." And that's what I think *Wing Commander III* achieved. We figured, as much money as they'll give us, we'll do as much as we can. And we'll have fun with it.

Q: Is there anything that you wish had been done differently, as far as quality or feel or anything?

CR: No... there are things that I will do differently on my next project. On this project, I still agree with why we made each decision. Space flight-wise, I wouldn't do change anything.

Maybe there is one thing. With the video, we ended up spending so much money and attention on shooting the scenes that if we had spent a little more money we could have also gotten a movie or a TV show out of it. That's probably one of the things I might have done differently. It's all a matter of money. Doing a movie version we would have seen our investment returned.

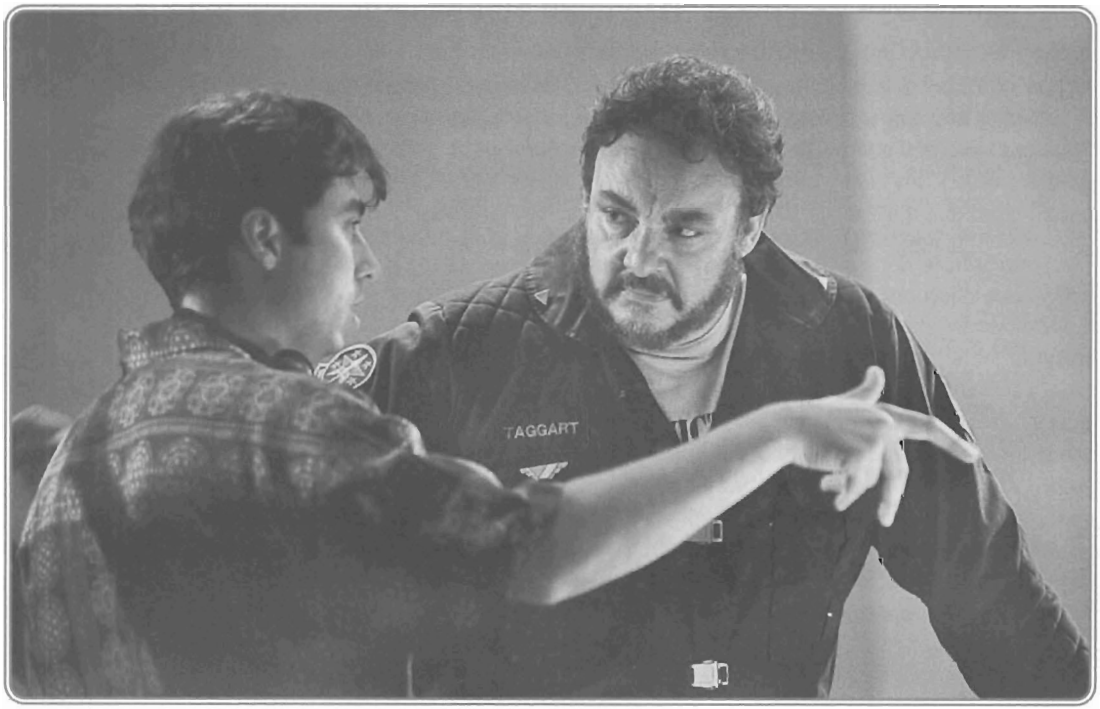
And another thing is, I think that even though using computer sets for everything is very cool, it's also a real pain. I would like to do it in a traditional movie style... 10% of the movie in special effects, using high end SGI stuff—really, really cool stuff—and the other stuff would be filmed on traditional sets. Because we wouldn't have to match computer backgrounds, we could have a little more fun with lighting and moving the camera, etc. We were using computer sets for mainly for "impression" reasons. I don't think that will be an issue in the next year or so. So that's pretty much what I would be doing differently.

Q: Was there any one point in the creation of the game when you thought, if this happens, then the game is going to be really great... but if this doesn't happen, then the game isn't going to be as good as it could be?

CR: To be honest with you, I always try not to worry. You sit around and worry and it gets to be gales of problems. I could spend way too much of my time stressing. Making a computer game has a lot to do with blind faith ... just believing that it's all going to work out. You have to have faith that you're going to be able to fix the bug, and you'll be able to make it work. It's as though when you worry about things happening or not happening, you'll never get it done. You'll sit and worry about it all the time, instead. So I really tried not to worry. My biggest concern was the movie player-machines, and whether we would be able to play back all the stuff that was shot. We had an idea it could, but we didn't know. and we just went ahead and shot it without having a movie player. They worked on it and did a fantastic job. We shot with blind faith that yes, it will work... we can make it work.

Q: Next, the classic "last question." What are you planning to do next?

CR: Go to Disneyland! I don't know. I have one project that I want to start developing, but I'm not quite sure what the storyline is going to be yet. But, yeah, it will probably be a movie/game project. I'm going to try to put it together.



Chris and John Rhys-Davies, a.k.a. Paladin, work through a scene.

PROGRAMMING

FRANK SAVAGE, GAME DEVELOPMENT DIRECTOR

Frank's room is kept in darkness, twenty-four hours a day. The only light comes from a pink elephant lamp that is perched on top of a speaker. There is a tie draped over the elephant's head, and the walls of his office are hung with star-charts and posters of space ships. It's a small office, and he nearly has to crawl over his desk to get to his chair—but once he's there, he's the boss.

Q: What did you do first as Development Director?

FS: Basically what we did for *Wing III* was to actually sit down and try and identify what we wanted to do. I wrote down every single thing that I thought the game was going to need—all the way down to the single-week task level. For example, we attempted to identify everything that constituted a cockpit. We made a list: cockpit, missile lock, missile targeting, missile launch information, displays for what weapons remain, for communications, for shields, for damage, and so on.

From that we determined how long it would take to do a cockpit. With that information, we tried to assign a milestone date—all of the cockpit functionality that we know of must be done by this particular date. If they were not all done by that date, we knew we needed to either redo the cockpits or make some serious cuts into what we planned to do.

Once we had a complete list of milestones, I tried to schedule the whole project. I began to think of who should take each milestone. Given that the cockpits, from the time someone started them to the time they were finished, were going to take X months, and that other things were going to take Y months, you then basically had to subdivide all that into the people available. If everyone had, say, 12 months of work scheduled, and I suddenly added the cockpits to someone's schedule—that means that person can't do all the things on his task list. Tasks would either would get done late ... or there just wouldn't be enough time on his schedule for him to finish it at all. When I scheduled the project, I could tell how many people I was going to need. I was able to show that we needed three more people.

So I then hired Chris Todd, Frank Roan and Tony Morone. I interviewed Frank Roan over the phone, back in late July, 1993. He was a huge *Wing Commander* fan, wanted to work on *Wing III*, had the programming experience necessary and was working in another computer game company's Tools group. We picked him up to do the space flight engine. He put me onto Tony Morone, who was a friend of his from college.

Tony, at that time, was doing spreadsheet and database programming up in Boston, wearing a monkey suit every day—the whole nine yards. He didn't know C++, though. I told him that if he could prove that he was willing to learn what it takes, even while he was working at another job, it would score big, here at ORIGIN. He worked up a very object-oriented demo in C++ that clearly indicated that he had been able to learn the language in a short time. So we hired him to do the cockpit systems. The rest is history.

Q: How did your schedule work out?

FS: Everyone met their timelines and milestones. We would meet every week and plan what we were going to accomplish the next week based on what we had accomplished the previous week. As time went on, we were able to make sure that things met their schedules without any problems. We stayed on or ahead of schedule pretty much through March, when it started to slide a little. We worked a lot of crunch through March and April trying to bring it back onto line, and did. We've been working steadily since then. There haven't been too many slips at all.

Q: What were some of the difficulties your programmers faced?

FS: One of the main differences between doing game programming and "regular" programming is that most of the other programming assumes that a lot of detail work is taken care of for you—for example, if you wrote a program for a fax system. The program might talk to a fax board, make sure that every incoming fax gets filed correctly, and always be running in the background—there is a certain set of assumptions you can make automatically. That's especially true if it's for a certain company and isn't going to be distributed all over the place. You can assume what kind of computer they are going to have, what kind of memory, what kind of fax board ... all of those things are what we *can't* assume. We don't have any idea what kind of memory the end user is going to have. We don't even know what system they're going to have. We can't know what kind of processor or input devices they have, whether it's going to be a Microsoft mouse or Logitech mouse, what kind of joystick they're going to use—top-of-the-line or garbage that breaks if you pull it wrong. We just don't know what kind of machine we're going to be dealing with.

We have to do a lot more low-level programming than any other industry, with the exception of operating systems. *Windows* or OS/2 or DOS can't assume what kind of machine they are going to be running on. We do what Microsoft or IBM does when they make an operating system, and on top of that we also have to write the actual game. It's way more complicated than any other kind of programming anyplace else. Once you get all the low-level stuff in you have to put all the rules in, and the graphical engines—whether 3-D or 2-D. Then when all that is in, it's a matter of finding out why all the pieces don't fit together. Then you have to get them to fit.

Q: What exactly is an "engine"?

FS: An engine is essentially the code necessary to draw the spaceships. An engine for a real 3-D world is a very different prospect than a top-down view. In a top-down view you usually only have to tell everything what can draw over what...but in a 3-D world anything can draw over everything else. There are a lot more in-depth calculations, plus one more dimension to take into account.

Q: What sort of surprises did you encounter, building a brand-new engine?

FS: We didn't. That was surprising because so many of the people involved were new to the industry. We didn't make the usual kinds of mistakes. The overwhelming reason was because we were in flat 32-bit protected mode.

That essentially means that every single piece of memory in the computer, in our universe, can only be talked to in one way — everything has its own address. In 16-bit and in real-mode, it's possible to talk to the exact same location in memory a bunch of different ways. For example, if you have a bad pointer (which is a memory variable) that says what I'm interested in changing exists in a certain place in memory, in our universe it can only screw up in that one place. In a 16-bit universe it can screw up any place. Our universe is a lot more stable. When something does trash a section of memory, it almost always trashes the exact same section of memory. It makes things a lot easier to track down. The precise same crash is very, very repeatable.

When something goes wrong in a game, you can repeat what you did and get the exact same crash. That's *extremely* different from any other game I've worked on in my life. We couldn't do this before now since the 32-bit protected mode can only be done for 386 or better computers. It was only about two years ago that we could start requiring 386s for games.

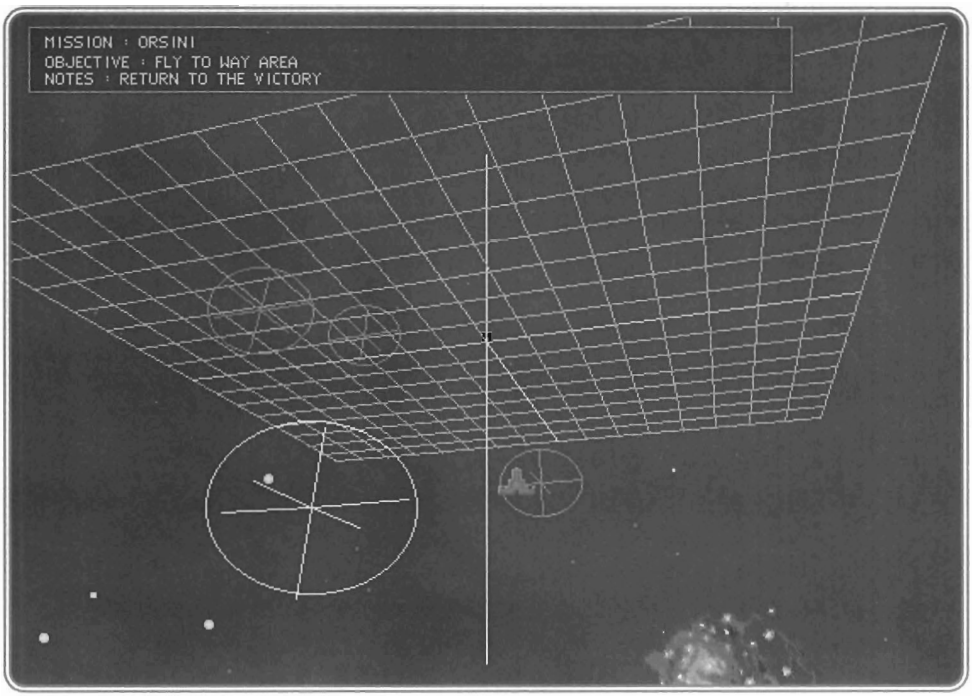
The other reason is that, until recently, companies weren't willing to put out the money necessary to buy a DOS extender, which essentially allows you to talk to all the memory in the computer without resorting to things like EMS or XMS or things like that. Companies wouldn't buy them because DOS extenders used to cost a truly phenomenal amount of money. You would have to pay about $1000 per

```
//============================//
//                            //
//   WING COMMANDER 3:        //
//   THE HEART OF THE TIGER   //
//                            //
//   "It's not a game — it's war."  //
//                            //
//   WC3.CPP: The main program file;  //
//   all gameflow action will         //
//   originate from here. — RCT       //
//                            //
//============================//

#ifndef WC3_H
#include <wc3.h>
#endif

#ifndef SYSTEM_H
#include <system.h>
#endif

#ifndef SCRIPT_H
#include <script.h>
#endif

#ifndef GAMEDATA_H
#include <gamedata.h>
#endif

#ifndef MISSIONS_H
#include <missions.h>
#endif

#ifndef FERROR_H
#include <ferror.h>
#endif

#ifndef PHARLAP_H
#include <pharlap.h>
#endif

#ifndef FNEARMEM_H
#include <fnearmem.h>
#endif

#ifndef DLL_H
#include <dll.h>
#endif

#ifndef VMMAN_H
#include <vmman.h>
#endif

#ifndef BFMAN_H
#include <bfman.h>
#endif

#ifndef DPMI_H
#include <dpmi.h>
#endif

#ifndef PARALIST_H
#include <paralist.h>
#endif
```

programmer for the development kit. Then there were the royalties to the guys who wrote the DOS extenders. We're talking sometimes about $1.50 per game sold, which is incredibly expensive — it's the same as adding the cost of three more CDs to the game. Instead, Jason Yenawine wrote our own DPMI server. We use that, so the game doesn't even need an outside DOS extender — it uses the DPMI DOS extender that is built into *Windows*, OS/2 and QEMM. So a DOS extender isn't even necessary. In those places where there are no *Windows*, QEMM or OS/2, we wrote our own little DPMI server to take care of that. That's even better. Because we hand-tailored it to the game, we get more memory — there isn't anything generic about the program.

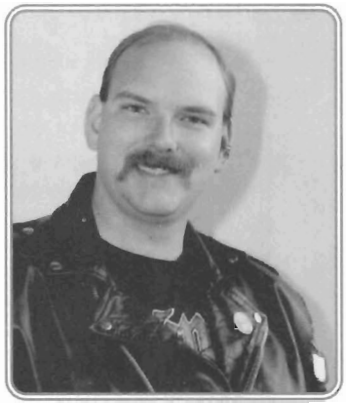
Q: Besides building the engine, what input did the programmers have in the game?

FS: Basically, anything that is in the game from previous *Wing Commanders* is Chris Roberts', but anything that was added, we embellished — all the actual programming, everything that makes the system work. For example, the way the 3-D nav map came out is due to Tony Morone. The way the ships move and the AI is all Frank Roan. The gameflow system, the features in it, all the implementation of the design was done by the programmers. There was very little "this is what is going in and this is exactly how it is going to be laid out." I essentially told the programmers "this is what I need, go out and do it — and if it comes back cooler than what I described to you, so much the better." That's generally what they did, and they did it all on time, too, which is remarkable.



When the programmers were told to create worlds, they answered with a 3-dimensional navigation map, complete with panning and zoom capabilities.

TIM RAY,
TECHNICAL DESIGN ASSISTANT



Tim works in a cubicle just outside of Chris and Frank's offices. Hanging on the wall over his computer is a nicked cutlass, dredged from a wreck in the ocean. He points out the hole in the scabbard where it was hung on a nail on the side of the ship so you could "grab it on the way out if you needed it." "It's nothing really special," he remarks, "but I like to ponder on these nicks in the blade." Under the weapon his monitor glows with multi-colored code.

Q: What does a TDA do?

TR: I, along with Ben Potter and Jeff Shelton, am responsible for maintaining all of the data, all of the missions and a lot of other things that occur in the game. The missions are our primary responsibility. Whenever you fly somewhere and have someone attack you in *Wing III*, that's something that we did. There are more than fifty-one missions in the mainstream game, plus another as-yet-to-be-determined number in the simulator, and all those will be our work eventually.

Q: So what do you do when you maintain the data? You don't do the art.

TR: Actually, we do a surprising amount of the art. But what we mainly do is make sure everything is where it needs to be in the "virtual world" of the game. When you maintain mission data you make sure everything is appearing in the correct place, is the correct thing when it shows up and has the correct attitude when it gets there. Jeff is doing all the debris for the fighters, so every time you blow pieces off of somebody it is probably the art that Jeff did. Again, that's a big load off the artists, whenever we take on tasks from them.

My special purview is all of the objects in the game... besides debris. Anything you see in the flight portion of the game, any capital ship, any fighter, any building on the ground, tank, any turret that suddenly turns to fire at you (and kill you), any ship that you can fly inside, all that is stuff that I maintain and make sure that it's correct in the context of the rest of the world—that it's the right size and color. That's a big part of what I'm doing. Which is good, because I was in on the design of the game from the word go, from the very beginning.

We also do a lot of things to AI—curse it, tweak it, beat it with big sticks. Ben Potter is doing most of that right now. He's doing the profile files, which are all of the communications that occur during the flight and all of the ratings that the individual pilots have when they fly. He's handling all that, which is a big load off of everybody's mind. Mostly it's just translating Chris Roberts' conception, Frank Savage's conception and Chris Douglas' conception into my version of that, then translating all of that into numbers that work in the files of the game. It takes a certain amount of mind-reading, a certain amount of tact and just a lot of work.

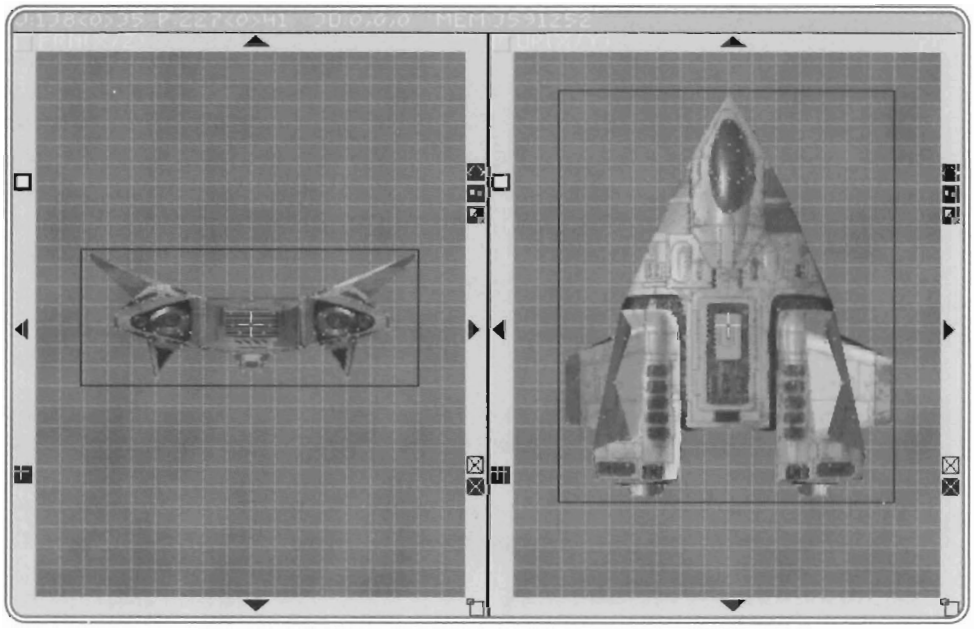
Q: You enjoyed working that hard?

TR: Yeah! I get to work with lots of different software packages. EOR, our in-house engine, *Animator Pro*, *Deluxe Paint Animator*, and the mission system, which is an in-house programming system very similar to Assembly. I also compile the game for Ben and Jeff because I've got a version of Metaware's High-C Compiler on my machine. So I go over the game at least once a day, with each new version. And that requires a certain knowledge of C. So I do a lot of things.

My favorite thing is that—well, I tend to see everything in light of the last project I worked on, since it was the first one I worked on here—during *Strike Commander* we tried very hard to "fit" the game to reality. That turned out to be a huge nuisance... which is something I never expected. In this game that particular constraint is not really there. All you have to fit is the design conception of the game, not reality. You only have to be consistent within that logic structure. It's a lot more free-flowing. If you need something new you just design it and build it and put it in. You're not constrained by real life. That's very nice.

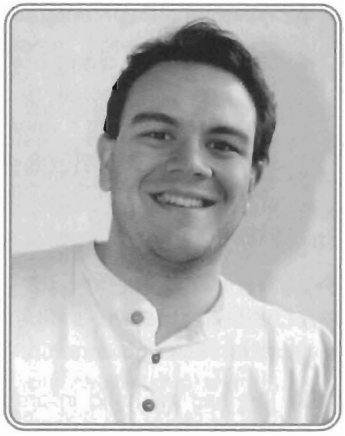
The other thing I like is that this project is much, much better organized and is largely on schedule. Which is a great surprise and makes me extraordinarily proud, because it's the first time a game has been this solid at ORIGIN and been on schedule still. We're working very hard to try and keep it that way. That's one of my favorite things.

We're riding high on this--morale fluctuates, yes, but we're riding very high on this. And that's very, very good.



EOR, one of ORIGIN's many in-house utilities, allows artists and designers to build wireframes and apply Alias textures to polygonal objects.

TONY MORONE, PROGRAMMER



Anthony Morone and Frank Roan share an office with a view of the empty lot between the ORIGIN building and U.S. Highway 183. The walls are covered with a wide assortment of posters. Snacks line the window sill, there are a couple of unrecognizable tinker-toy and Lego structures on their desks, and on a bookshelf there is a box of soft foam balls for throwing at people. Nevertheless, the overall atmosphere is one of earnest programming.

Q: Frank Savage said you came up with the 3-D nav map. How much did you know already when you started working on it?

TM: Basically the only guideline was to make it a 3-D nav map—we didn't really have anything planned at that point. That was how the whole project has been. Each of us has influence that we can use on how things get done. Frank said, "We need a system to do this. Go ahead and do it however you think it should be done." So it was a lot of fun.

We always start with *Wing II* as the model, basically because we want things to be backwards compatible. That's why when you go into the nav map and get a top-down view, it looks similar to the *Wing II* nav map. Only then you get an added surprise when you move the joystick and everything starts turning around you.

So, basically we started with "what did the *Wing II* nav map do?" Functionally, it's pretty much the same. It gives you the same information as far as what you have to accomplish in the mission. Only now we treat it as kind of a tactical display, because when you go into a mission area you can just pull away from the game—onto a nav map—and zero in on your area. You can bring up targeting information on all the enemies or all the fighters in that area. You can see the exact formation of all the ships in the area and plan what you are going to do and how you are going to attack the mission. All that is new to the map. It wasn't planned... it just kind of evolved into that. We never really sat down and said, "Well, the nav map should have this, this and this." We just started with the idea for it to look like *Wing II*, then made it 3-D, and then said, "Hey, wouldn't it be cool if we put in targeting information?' It kind of evolved.

Q: Did you add anything "just for fun"?

TM: The damage effect on the windshield is something I'm proud of. I've gotten compliments on that. When you get a "crack" on the windshield, the crack distorts everything like a lens. People don't expect that. At first it just looks like a piece of art—but then when you fly around you notice that everything's distorting behind it. It didn't really improve the gameplay, but it improved the experience.

Q: What part about being on the team do you dislike the most?

TM: I don't know. I didn't like carrying a deer out of Chris Roberts' back yard. The team went up to his house to enjoy a couple of beers on the lake. When we got there we ended up carrying a dead deer out of Chris' back yard, which reportedly jumped over the fence or something and died. Myself, Frank Savage and Chris had a team bonding experience and carried it out. That's probably the thing I disliked most.

FRANK ROAN, PROGRAMMER

Q: What have you done on *Wing III*?

FR: I've had my hand in probably everything involving space flight in the game, so it's been a lot of stuff! I've done a lot of the feel of actual gameplay —the sense of flying around and everything. Also, I worked out the way the AI (artificial intelligence) interacts with you.

Q: How does that work?

FR: Basically what I tried to accomplish in writing the AI was to get it to feel like you're flying against an intelligent opponent. I didn't want the player to feel the game was computer-controlled. I put in a lot of varied maneuvers to make the enemy seem real. There's a lot of personality reflected in AI. Some people are more trigger-happy, some people are a lot more courageous. The brave ones are willing to go out and kill and not care if they get injured so much. Other people will run after you have landed a few shots on them. Plus, there are a lot of tactics that they use. There are a lot more maneuvers in this than there were in any other *Wing* game: flank attacks, head-on attacks, fade attacks....

Some will flank —go around behind you and try to attack you there. Others will attack head-on, while some will kind of fade out and get out of your firing range to let things recharge, come back and fire on you, and keep going. Things like that. The experience should be that you will never get the same type of battle twice. Things will vary.

I also wanted a lot more taunting. I tried to write it when we started to do the radio communications. I wrote up as much as I could, just so we'd have it. I've always liked taunts. In the same way, most people like to have a lot of variation in what the other pilots say to them. So now we have high morale and low morale in-flight communication. Some wingmen will be more respectful towards you when they have a high morale. Some of them will be more cheerful. When they have low morale, though, you should be able to hear from their voices that they are disgruntled. They'll have more of an attitude. We tried to have a variety so you'll always feel like there are a lot of different characters out there.

In terms of other things, we are all hard core *Wing Commander* game players. So, for example, a lot of features that weren't in the original game, that we always wanted to see, we added. For example, we worked out a lot of the whole damage system—trying to figure out what would be fun and what wouldn't. We've got a huge damage system going. The designers actually came down to us and asked, "Whose idea was it to do the damage system? Or was it our idea from the beginning?" A lot of it was ours, the programmers. We've played it so much, and we've played so many other games, we knew it would be cool to have that kind of damage system. So we worked it out.

Everything you see moving was basically done by me or Tony. Of course, Frank did a lot of the new technology. That's a lot of his stuff, too, in there. But how pilots fly, what they say, how your systems work, what happens when you fire your guns, what happens when you fire missiles, what happens when you go to your capital ship and it's being attacked—that whole experience—I created a lot of that. And I'm proud of that.

It was always one of my goals to work on a *Wing Commander*. I remember when I played *Wing Commander I*, I sent in a resumé. I couldn't even get my foot in the door actually. So I settled for playing *Wing Commander*. Then when someone brought me *Wing II*, I called up ORIGIN and got Sharon Miller when she was still working at Western Temporary Services. I actually called. I was about to graduate from college, and I said, "Look, I'll pay for myself to fly down, I'll pay for myself to relocate. I'll do anything. I'll work for five bucks an hour at UT. I don't care. I just want to work for ORIGIN." They said, "Well ..." and they kept putting me off and putting me off. So I went to work for some other game companies, and then a year and a half later I sent an updated resumé. I got a call from Chris Roberts saying, "Hey, your resumé is perfect. We'd love to have you come work on *Wing Commander III*." I thought, *this* is a big turn-around.

Q: Is there anything that you'd like to put in, or that you're disappointed in?

FR: As I found through the years, and as most software developers will tell you, a product is never finished. It is rare for anyone to have done any piece of code, no matter how small, and say they're done with it. There are always things you can improve. There are always little nuances you can add. So, yes, we can work on *Wing Commander III* for the next five years and feel like we've not actually gotten into it. AI could always be better; you could always take more into account; the cockpits could always do cooler things; the attack ships could always be more in depth; it would be cool if you could actually land on a planet and walk around and talk to people. There's so much detail in a world that, yeah, you could infinitely go on.

A lot of it comes down to time—processor time—if the machine can handle it or not. There's things that we look at and say, "I wish we could get faster machines so we could put more detail into that or have more stuff." For example, you get an attack ship now and there's so many turrets on it. There's so many scenes going on that your framework starts to bog. We have to cut back on things like that. We couldn't go into more detail than we did because of hardware limitations.

ART

The creation of an interactive movie put great demands on the team of artists that were chosen to work on the game. Graphics are what grab the player's attention at first, and keep the enjoyment level high — if they live up to expectation. Chris Roberts' expectations were high. It was not enough to look merely good, it had to be spectacular.

Every background had to be realistic. It was very important that the actors never looked like they were walking around inside a Saturday-morning cartoon. There could be no discernible difference between the computer-generated setting and the few props that would actually be on-stage. In brief, it had to look like a movie.

CHRIS DOUGLAS, ART DIRECTOR

Chris has decked his door with "Dilbert" comic strips that he downloaded from the Internet, and his walls are hung with Maxfield Parrish posters. Compared to the other people on the *Wing III* team, however, the interior of his office is fairly uncluttered. Besides his PC and SGI there is only the black television that he uses to play tapes from his collection of *Mystery Science Theater 3000*, a comfortable chair, two strings of blue and purple origami cranes and thirty-four miniature *Star Trek* spaceships. "When I was a kid, I would have given anything for some of the toys they have out now," he confides. "I'm pretty bitter about how empty my childhood was when today kids can get all sorts of neat stuff...now I just wish they'd come out with some *Babylon 5* ships."

Q: What did you do in *Wing III* as the Art Director?

CD: Well, aside from a fair amount of administrative stuff, I set the look and feel of the game, and did a lot of the conceptual design work. For instance, I came up with the look for the Kilrathi and the look for the Terrans.

Q: What kind of look?

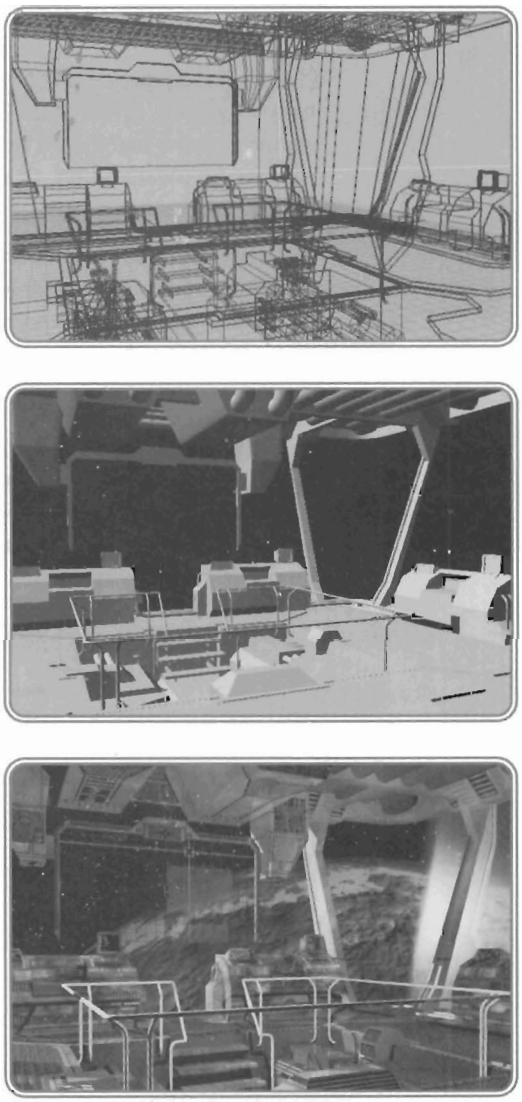
CD: The idea with the Terran stuff was to try to make it all look like a natural evolution of modern technology. The Terran ships look like modern war vessels, aircraft carriers and battleships and cruisers, with big turrets, radar antennas and reconnaissance towers ...the way human stuff looks right now. It's supposed to be an evolution into the future, so the design is all vaguely similar to existing objects. The fighters are reminiscent of modern fighters in their shape and their coloring, the placement of canopies, and stuff like that. They have fuselages and things that look like wings and engines bolted on to them, with everything all nice and symmetrical. They even have bubble canopies like a P-51 or F-16. It all sort of ties back with the way things are today.

The Kilrathi stuff is completely different. In the first place, it's asymmetrical. Their ships tend to be really wide and short, whereas the Terran fighters are like modern fighters that are long, with wings and an axis that runs from tail to nose. The Kilrathi fighters don't even have an axis. It's all sort of modular, instead. There might be a crew compartment, and next to it would be a weapon compartment... and maybe an engine compartment next to that. The pilot looks like he's sitting on the left-hand side of the ship with a bunch of gears on the right hand side, and there might be a big, pointy, really aggressive wing sort of sticking out. Everything will be asymmetrical in some way. Even their capital ships, their big cruisers, are asymmetrical.

The whole idea is to look alien. There are a couple of different reasons why we chose asymmetry. First of all, this is something that we've never been able to accomplish before because of the way we've been doing space flight. The way that we created the artwork in *Wing II*—there were no polygons. We'd make a spaceship in 3-D and then render thirty-seven views of it. Then the computer would just grab one of those thirty-seven frames and throw it on the screen, scale it up, and rotate it to indicate the direction of the ship. But since we were already doing thirty-seven views, we'd only render just one side of it. Then we'd mirror it over to show you the left side of the ship. Otherwise we'd have to do twice as many views. It would be inefficient, and we'd have to store it all in memory.

So because of that everything was symmetrical, because we were going to have to mirror everything to get the left side. Both sides had to be exactly alike. We don't have to do that anymore because we are actually rendering a polygon in space, so there is no reason for it to be symmetrical. So, of course, we wanted to take advantage of the fact that we could get away with asymmetry. That's a big difference between *Wing II* and *III*.

Besides, I've always wanted to do that. There's no reason for spaceships to be symmetrical, unless they're going to be flying around inside the atmosphere.



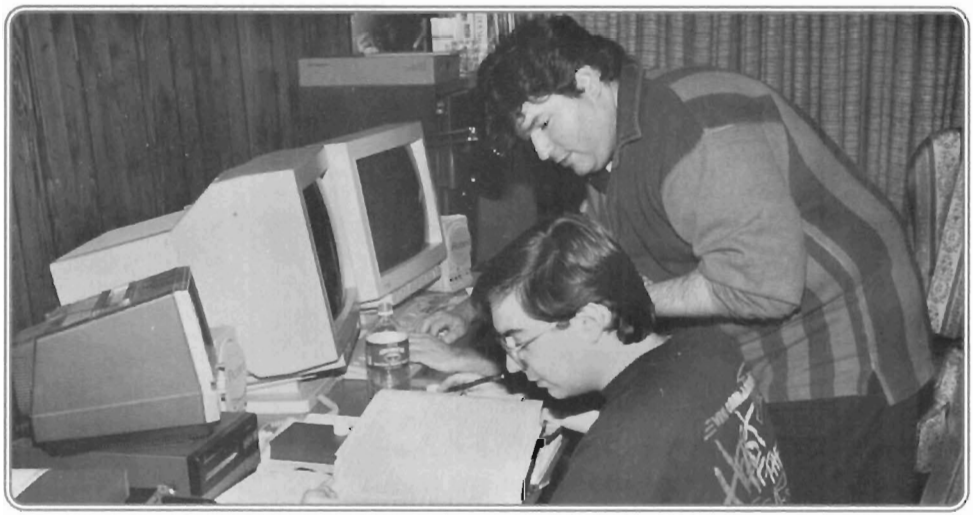
Chris Douglas' forte is to turn concept into reality. Here, a rough sketch evolves into a final rendered set.

Q: I noticed that you used shading differently.

CD: Yeah, we did. In the first place we could use shading to make it look like objects had rounded edges. The way that we did it was to build elaborate Alias meshes for these ships with a lot of detail on them. It was far too complex for the spaceflight to render in real time while you are flying around. So first we built simple polygonal versions of those ships, just approximating the shape of it. It didn't have as much detail -it didn't have bumps all over it or all the geometry that we put in to the Alias mesh.

Then we'd do renders with raytraces of all the different views of the ships: top view, right view, bottom view, left view, front and back view. Six of them. We'd take advantage of all the complex lighting features that Alias has, such as texturing panels or shadows being thrown and highlights on curved surfaces. These things didn't exist in the EOR version of the ship. For instance, if you had a corner of a spaceship where two faces came together, it would just be like a hard edge, full of facets. But with the Alias renders textured on, this gets smoothed out. You get a highlight and the whole thing seems rounded.

So we'd take these renders and texture them onto the polygon. What you end up with is a simple, crude polygon that the computer is drawing real-time, but that had these really high-quality texture maps and renders from Alias. The player's eye glosses over the facets of the crude polygon and sees the texture maps. Think of the texture maps as decals or paint on the basic, crude spaceship. They make sharp polygonal edges look like they curve. The overall illusion is that the computer is doing an elaborate raytrace---the kind that would take an SGI with a 150 MHz processor and 120 megs of RAM twenty minutes to do---but your computer is doing it at 20 frames a second on screen with six different ships flying around. It's just an optical illusion. If you really look at it, you could notice that when the ships move, their shadows don't change. But you usually aren't looking that closely during the game.

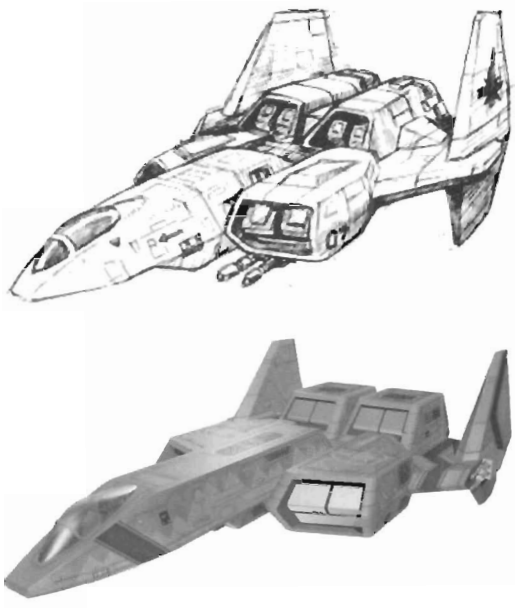


Bleary-eyed, Adam Foshko and Chris Douglas dig into the script as they match synthetic backgrounds and live video footage.

Q: What differences between *Wing II* and *Wing III* are you the most excited about?

CD: Well, the cinematics, of course. They're quite a bit better. Having real people helps. I think we did a good job making the backgrounds work for the people.

Of course, the volume of art was incredible. I'm willing to bet that when people see it, they're going to say "Well, it's amazing that it took as long as it did to do the artwork. It's not like they had to do all the stuff for the cinematics. It was all film." But we had to do about ten times the work to create those computer generated backgrounds than we did for the entire production of *Wing II*.



The Excalibur—from original sketch to the most powerful fighter in the Confed fleet.

First of all, we had to try and make them look realistic, which in some cases was hard. As we worked on them, we gained experience, so the later sets began to look a whole lot better than some of the earlier ones. That's something that happens with every project, especially if you're working with a new tool. You just get better as time goes on. So we had to go back and redo them to take care of fluctuations in the quality. What was actually the most work for me was getting the camera angles to match up with the shot. There's a fundamental difference in the camera that they use to shoot the actors with, and virtual cameras in Alias. There is a very profound discrepancy in the way those two things perceive perspective. It's often very difficult to get things to match up. We had to tweak the hell out of them. There's no good system for doing it—it's almost an impossible task.

The original plan was that we'd go from the storyboards and set up our cameras in Alias, then ship those renders to California. There, they would make their cameras match ours so we'd never have to touch them again. It was just a fantasy. Out of the maybe two or three hundred camera angles in the game there are maybe six that didn't change. It's kind of frustrating because we spent days getting just one background right, or throwing in detail where something is missing, and nobody will ever notice. All anyone is going to be looking at in that one shot is Mark Hamill's eyes or something, and not what's going on behind him. The thing is, if we've succeeded, no one's going to notice it. I guess the sets we're most pleased with are the Flight Control and the Barracks. The Director of Photography helped with those — we learned a lot by watching him. Just the amount of stuff I learned about lighting and camera angles was amazing.

I had a blast down at the shoot. It was kind of like going to survival camp, it was pretty harsh out there. They ran us pretty ragged, working long hours. There are certainly a lot of personalities out there. And earthquakes, smog, traffic, actors, actresses....

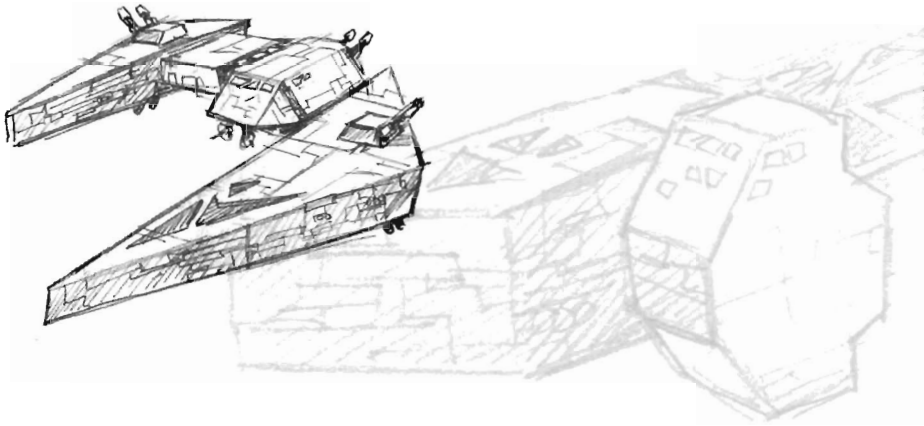
Q: Were there any unexpected problems?

CD: Yes, indeed. Yes, indeed. The first and greatest surprise for the artists was that we had about two years' worth of stuff to do, but only one year of time to do it. The second surprise was the hardware. We needed high-tech computers. We needed lots of them. At first we thought that one Indigo II, and three Blue Indy computers would do the trick. Then we realized that we couldn't use the Indies, and had to replace them with Indigo II's—then we needed another Indigo II.

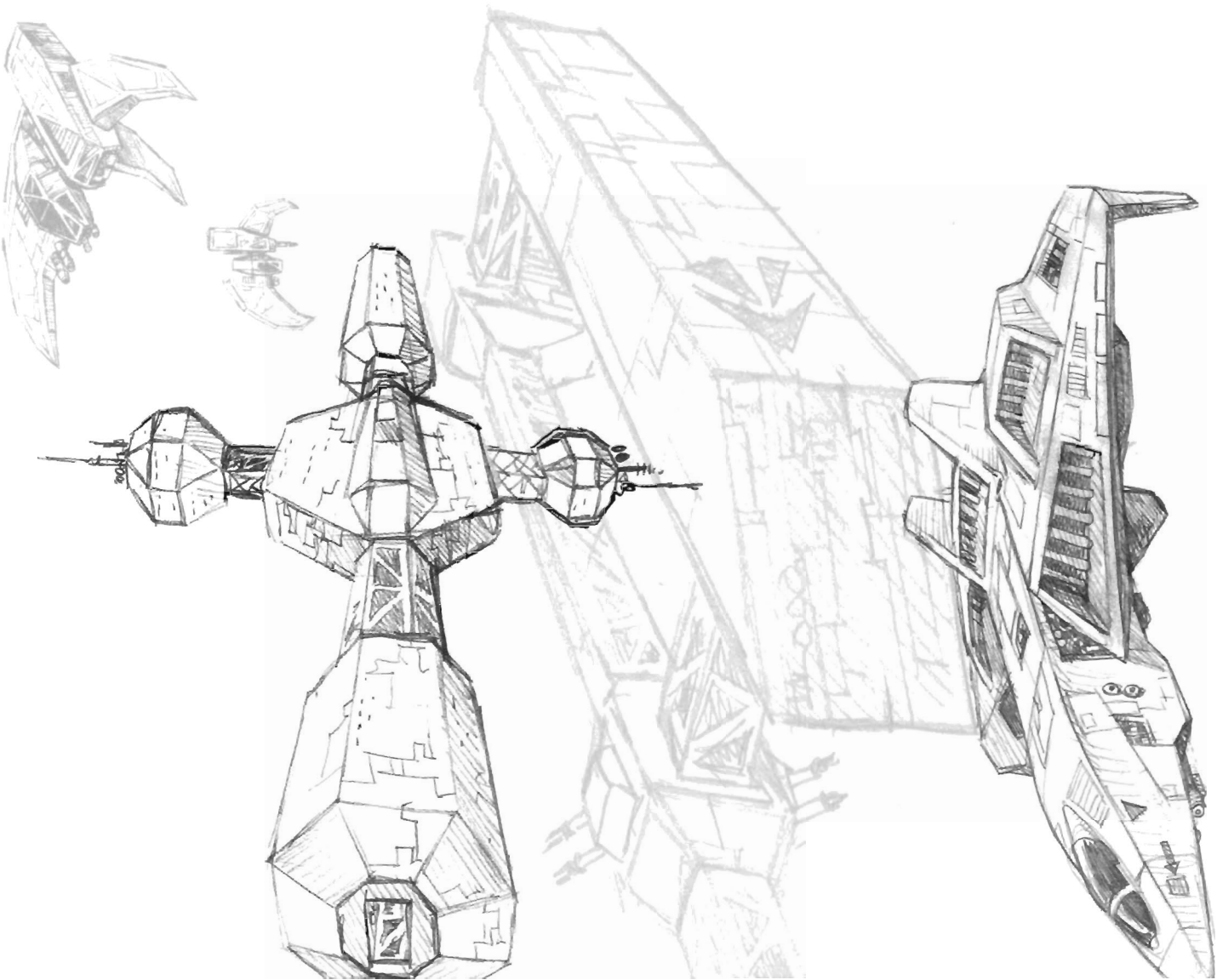
But then even that wasn't enough. We had to have an Onyx—which is a super high-end multi-processor system. Then we needed a vault for the Onyx to hold enough drives to supply all the data storage. That's not even mentioning the software. *Wing III* needed to be designed in Alias—it creates graphics superior to 3D Studio's artwork. It provides a higher quality for shading, lighting and texture because it is a ray-tracing program. All in all, the hardware and software costs mushroomed to a lot more than anyone expected.

Q: How did interactivity change the way you designed backgrounds?

CD: I learned about integration. Part of the job of the artists is to give some way to integrate the background with the characters on-screen. Small things make a huge difference. If an artist incorporated a red light onto a wall panel, and whenever an actor leaned near the "wall," a tech highlighted his face with a red glow, the two separate elements are linked. The idea that there was no wall there at all is harder for the viewer to imagine. The shuttle was conceived with the same effect in mind. It was designed with a grid over a red light that would cast shadows on everything below it. The walls were rendered with parallel shadows. When the actors were filmed for that scene, the crew put a thick wire mesh in front of the stage lights, so that the viewer would perceive them as actually being within the set.



Original concept sketches by Chris Douglas for a number of the Terran and Kilrathi ships.



PRE-PRODUCTION

SCRIPT

Wing Commander III, ORIGIN's first interactive movie, needed a script.

In a very real sense a script is the backbone of a movie's creation. Everything is connected to it. It gives shape and movement to the process of construction. Rich Hilleman, the head of Electronic Arts' Simulations & Movies division, made the suggestion that before the script was created, a Story Editor should be found.

Hiring an editor before hiring a writer might seem a little backwards, but one factor kept arising to haunt the "Hollywood" side of the project. They needed a movie, not for a theater screen, but for a computer monitor. That difference was something that was guaranteed to cause headaches and misunderstandings with anyone used to dealing with the regular filmmaking industry. The Story Editor was hired to act as a liaison between the two worlds, making sure that everything was understood as clearly as possible. There was no time, or budget, for mistakes.

Donna Burkons was hired to be the Story Editor. She was found through an EA producer familiar with the Hollywood community. After meeting with Chris Roberts to learn what he envisioned, she went out on a hunt for writers. She found two. Frank DePalma and Terry Borst were a writing team who had worked together for several years with consistently good results. When Ms. Burkons outlined the situation to them, they were intrigued.

Non-linearity is an unusual concept for movie people. It's not even as easy as the books where, if the reader wants the detective to go into the attic, then he should turn to page 64. It's much more complex. There are many branching paths that affect morale, and depending on what level someone's morale registers, the path you follow can be quite different. All your steps from that point change. In general it all fits together, but it isn't easy or linear—and it certainly isn't what people are used to seeing.

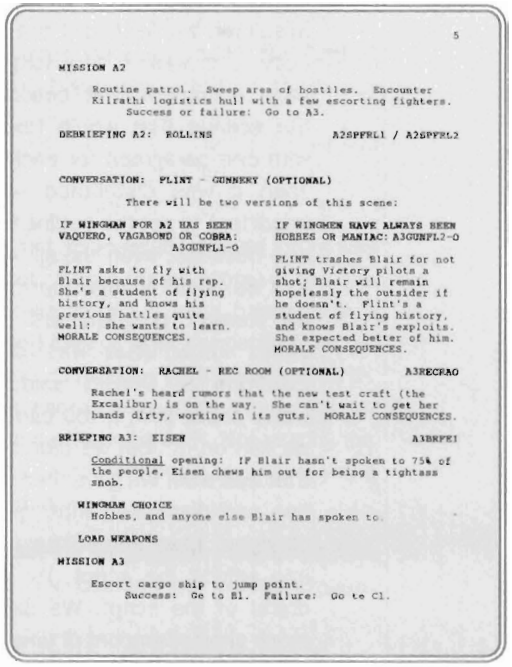
Richard Johnson sorts and cross-references the volumes of paper work on his makeshift desk in L.A.

FRANK DEPALMA AND TERRY BORST, SCRIPT WRITERS

Q: What did you think about the project, at first?

FD: We liked the logic problems of a story that branches in different directions, and then maybe meets up again. There are emotional events that you may or may not encounter again. There are ripples outward, and everything affects everything else. It's a story where something different could happen every time you play the game. If you meet a person once, then the second time there is a past already from the first meeting. The next time you play the game, though, perhaps you don't meet that person in the same situation. There are going to be a lot of writers who don't like that. We did. We enjoyed it. It made the challenge interesting.

As a matter of fact, after the first draft we had to trim it down. We got carried away writing scenes that — even within the scenes — branched. We had it to where whole conversations would branch to the point that they couldn't shoot them all. There was too much for the budget, and for the space of the CDs. Interactive can get insane and undo-able really quickly.



5

MISSION A2

Routine patrol. Sweep area of hostiles. Encounter Kilrathi logistics hull with a few escorting fighters. Success or failure: Go to A3.

DEBRIEFING A2: ROLLINS A2SPFRL1 / A2SPFRL2

CONVERSATION: FLINT - GUNNERY (OPTIONAL)

There will be two versions of this scene:

IF WINGMAN FOR A2 HAS BEEN VAQUERO, VAGABOND OR COBRA: A3GUNFL1-O

FLINT asks to fly with Blair because of his rep. She's a student of flying history, and knows his previous battles quite well: she wants to learn. MORALE CONSEQUENCES.

IF WINGMEN HAVE ALWAYS BEEN HOBBES OR MANIAC: A3GUNFL2-O

FLINT trashes Blair for not giving Victory pilots a shot; Blair will remain hopelessly the outsider if he doesn't. Flint's a student of flying history, and knows Blair's exploits. She expected better of him. MORALE CONSEQUENCES.

CONVERSATION: RACHEL - REC ROOM (OPTIONAL) A3RECRAO

Rachel's heard rumors that the new test craft (the Excalibur) is on the way. She can't wait to get her hands dirty, working in its guts. MORALE CONSEQUENCES.

BRIEFING A3: EISEN A3BRFE1

Conditional opening: IF Blair hasn't spoken to 75% of the people, Eisen chews him out for being a tightass snob.

WINGMAN CHOICE
Hobbes, and anyone else Blair has spoken to.

LOAD WEAPONS

MISSION A3

Escort cargo ship to jump point.
Success: Go to E1. Failure: Go to C1.

Writing scenes for a branching storyline created challenging logic problems for the script writers.

Q: What were you given to work with?

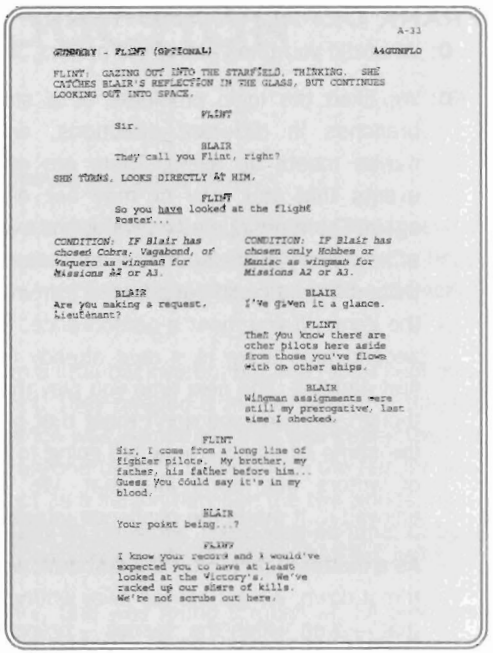
TB: We were flown to Austin to meet with Chris Roberts. He explained his ideas and a general outline of what he expected for the game. He also gave us a mission list that had been designed by his team.

There was no script, there was only a very broad-stroke storyline. The situation with Hobbes, and so on. We had continuing characters from previous *Wing Commanders*, and the idea that we were completing the trilogy. We also had missions that were fairly detailed. It was a little like having a storyline. We had to connect the dots so that the story and missions would match. Then we had to write the screenplay with all the ancillary scenes and contingency scenes, like your death scene, your wingmen's death scenes, and even some scenes that I'm not sure made it to the final cut.

FD: We had to learn about the *Wing Commander* universe and what had been done before. In the previous games there were stories and distinct characters. We pored over the previous writings.

They came to us with the missions all planned out. Hidden in those missions was the storyline — the winning game and the losing game. We started with their skeleton of the missions, and broke it into seventeen or eighteen sections. We called them "acts" because that's what we are used to. Usually a movie has three acts, so this

was a little like a mini-series. Each act had about three or four missions. When we were given a list of missions, we fleshed it out with an outline. It was a very long, multi-page document that described all the scenes that would take place with one paragraph for each scene. Then it was distributed — it was important to get the outline to everyone because, even though we were told we could change the missions, we weren't programmers and we didn't know what was possible. Everyone at ORIGIN said, "Don't worry about that, if you can think it, we can do it," but we didn't know if that was true. We gave them the outline and discussed that, made the changes, then immediately jumped into writing the script. We did two drafts of the script. We did it in a much shorter amount of time than we were used to for the movies, which was strange because it was such a long script.



A-31

[illegible] - FLINT (OPTIONAL) AAGUNFLO

FLINT: GAZING OUT INTO THE STARFIELD, THINKING. SHE CATCHES BLAIR'S REFLECTION IN THE GLASS, BUT CONTINUES LOOKING OUT INTO SPACE.

FLINT
Sir.

BLAIR
They call you Flint, right?

SHE TURNS, LOOKS DIRECTLY AT HIM.

FLINT
So you have looked at the flight Roster...

CONDITION: IF Blair has chosen Cobra, Vagabond, or Vaquero as wingman for Missions A2 or A3.

BLAIR
Are you making a request, Lieutenant?

CONDITION: IF Blair has chosen only Hobbes or Maniac as wingman for Missions A2 or A3.

BLAIR
I've given it a glance.

FLINT
Then you know there are other pilots here aside from those you've flown with on other ships.

BLAIR
Wingman assignments were still my prerogative, last time I checked.

FLINT
Sir, I come from a long line of fighter pilots. My brother, my father, his father before him... Guess you could say it's in my blood.

BLAIR
Your point being...?

FLINT
I know your record and I would've expected you to have at least looked at the Victory's. We've racked up our share of kills. We're not scrubs out here.

Many game conversations depend on the player's actions - both past and present.

We created character relationships and subplots that interwove with the missions. People react to the state of the war, and to which track you're on. From the skeleton of the missions, we put on the muscle and skin through relationships and story.

Q: Was it different to write for a game?

TB: Besides that when you write, you hope that it's showing in a theater full of people?

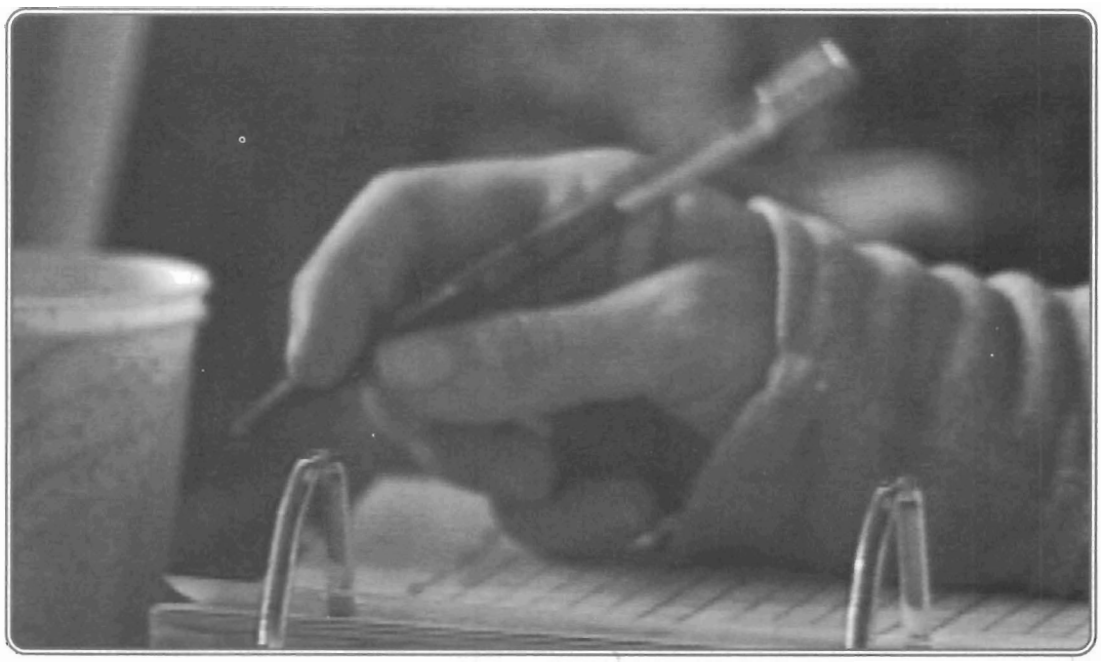
FD: When you're writing a movie, you often think of many different directions in which you'd like the story to go, but you can only choose one. You agonize over whether you chose the right one. With this, it's interesting because if you do have more than one idea, you can explore several and see where you go. It's more work. You want all the choices to seem valid. A game where one choice is better than another wouldn't be any fun. It was a struggle to make all the choices seem like good ones. We pulled our hair out late at night looking at our two hundred index cards on the floor between my living room and my dining room — trying to see how these things are going to affect each other. You'd say "In this scene, Blair is going to say this," but then you realize he can't say that unless Blair has seen this other scene, and you don't know if he has or not. Then you have to think of something that he *could* say. None of that comes in the course of writing a regular movie. It's all drama and character and story.

TB: We tried to keep the characters equally balanced--where the player doesn't say "this one is obviously better than the other." Where there are choices, hopefully one won't be evidently better than the other. Which one raises the morale? Which one lowers the morale? The idea with Maniac's morale was that it should never be obvious. We made a guess as to an evolution from the previous character. He seemed like the kind of guy who likes abuse since he's always dishing it out. If you cave into him, that's not going to impress him. You have to stand up to him.

Q: How does collaborating on a project like this work?

FD: Terry and I have been writing together for years. We just accidentally slipped into a way of working together that works for us. We spend a lot of time together only in the outline stage. We use little 3x5 cards. On each card we write out what happens in a scene. When the cards are done, we have a very good idea of what happens. Then we say "you do those cards, I'll do these cards." and we just modem stuff back and forth. Then at the end, we come together and argue about where commas go. We do talk on the phone when we write. Our writing styles were similar to begin with. Not exactly the same, but similar. Sometimes when the voices of the characters begin to evolve, you'll get "I didn't know that character was going to talk that way."

TB: The marvel of the modern age is that we don't have to sit together. We wrote this script in the days after the Northridge earthquake. You couldn't get around anyway. You had no choice but to stay home and write.



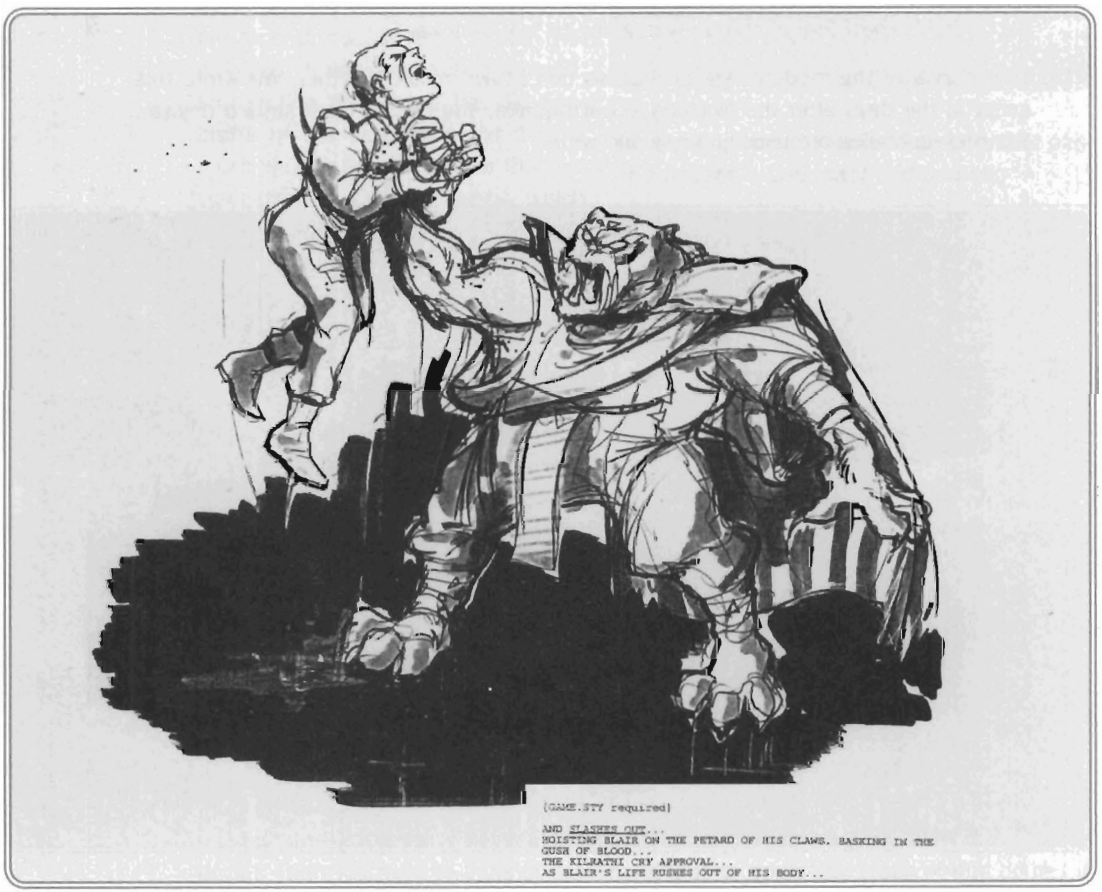
Frank DePalma and Terry Borst wrote the initial draft of the script in the days following the Northridge earthquake in California.

STORYBOARD

Even a normal script is intimidating .. but *Wing III* was so huge that it could make cast and crew alike turn pale. Part of the problem was visualization. Looking through a script doesn't really convey a movie's "character." Without understanding the look and feel of a production, many people--set designers, prop masters, even actors--are at a disadvantage. There is no certainty that their guesses would be right, and mistakes cost time and money.

The best answer is to transform the script into pictures. For this purpose, they call in a "storyboard artist." Such an artist has experience in envisioning, not only each scene, but how it will connect with all the other scenes, making it possible to visualize the connection process. In an interactive movie, this stage is even more important.

ORIGIN hired Marc Baird to hand-draw every scene in *Wing Commander III*. To guarantee accuracy, he worked closely with both the director and the Director of Photography. In a very real sense, every hand-drawn scene sets up the camera angles and shots. The artist re-drew any changes to the scenes as the production rolled on—with each new or changed scene displayed on a different colored paper stock.



Marc Baird hand-drew every scene in the game before it was filmed, to set up camera angles and shots.

MARC BAIRD, STORYBOARD ARTIST

Wherever Marc sets up shop soon becomes a flurry of scissors, multi-colored paper, sketches and photocopies. To an outsider it looks like a kindergarten craft hour that has exploded — but it's an integral part of developing a movie.

Q: What was it like working on an interactive movie?

MB: Interactive movies are a lot more work than a normal film. The amount of work generated by the interactive medium was amazing. It was a huge script—it was bigger than any script I've ever worked on. It's an interactive movie — it was like doing three films all at once.

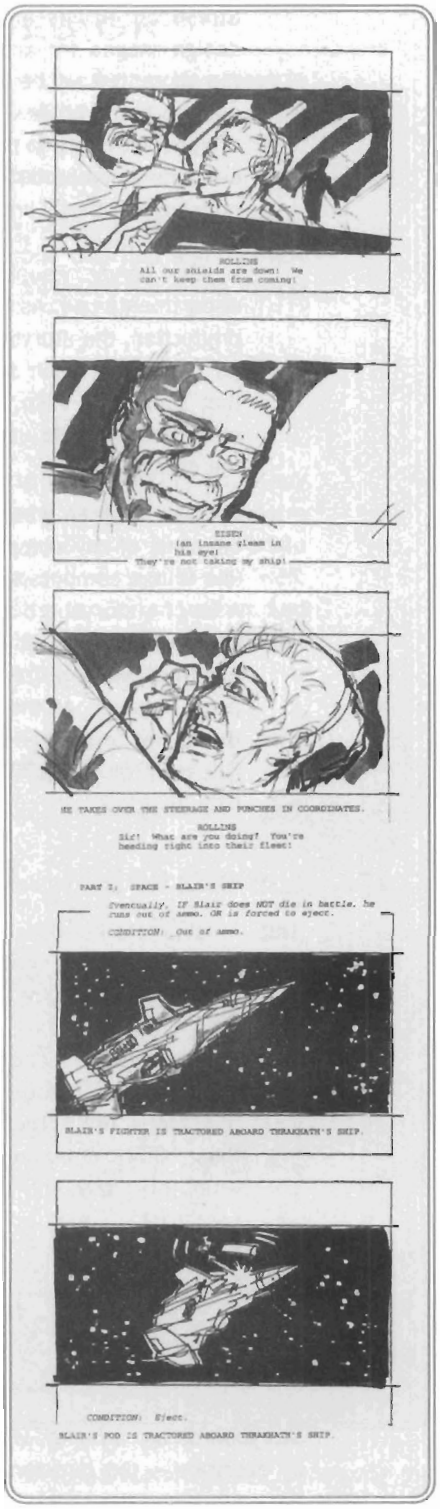
Q: How do you go about sketching it out?

MB: In the past, I usually used paper, pen and pencil. I've seen the wave of the future, though, and it's storyboards on computer. The guys in ORIGIN have encouraged me—and they certainly have the know-how—to move in a high-tech direction. I have a Wacom tablet with a pressure-sensitive, wireless stylus. I can push the pen on the tablet and the image shows up on the monitor. You are looking away from your hand and looking at the monitor. They have palettes that simulate brushes and textures, with a million colors.

Q: What exactly was your part in the production?

MB: Storyboards are like a comic book of a film. I'll usually read a script, sit down with the director, then we'll cover a scene. The director will describe the angles to me that he wants. Once we decide on the angles, I'll draw them out. It saves a lot of money, down the line, when a shot is being set up because it gives the crew a frame of reference. I'm primarily an artist who shows people what a scene is going to look like. It's one of the best ways for the director to communicate to the crew.

ORIGIN wanted *Wing Commander III* to be as cinematic as possible — that's why I was brought on. I really admire Chris Roberts because he was really more prepared than many directors I've worked with in Hollywood.



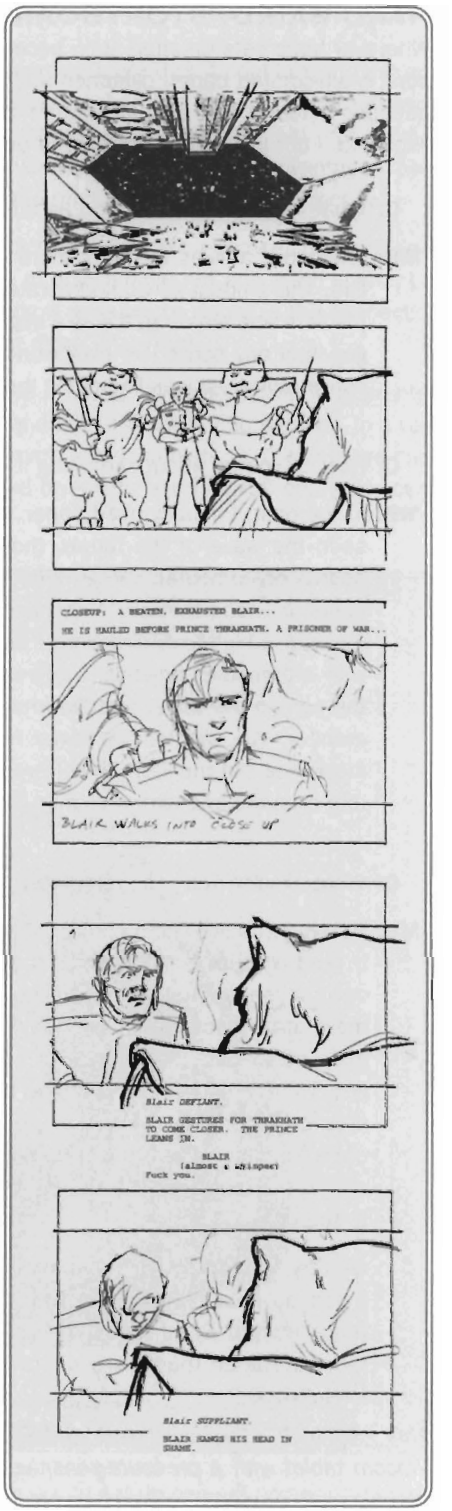
This high-tech storyboard was produced by Baird on a Wacom tablet with a pressure-sensitive, wireless pen that can simulate brushes, textures and a million colors.

Storyboard artists are used in the early design stages for actually laying out all the shots that will be in the film. They are used to getting bids when there are a lot of special effects in the movie—you can send the storyboard to the special effects houses, and they'll know what effects are in store, based on the boards. They are a very handy, visual guideline that all departments use. As they are shooting in production, the storyboards are on-stage. As they shoot each scene, they'll check that scene off. Also, in post-production, many times editors use the boards to cut the shots together.

Maybe *Wing III* was interested in me because of my computer background. I like to use computers to do storyboards. A lot of a storyboard artists—their down-time comes from physically cutting and pasting. When a director changes an angle, instead of the artists running to the copier to enlarge it or flip it, we can just do it all in the computer before the page is printed.

Q: Was it like any regular Hollywood job?

MB: All directors are different. Some have all the shots in their heads. They know what camera lens they're using ... they'll say "that's a two shot — camera pans left to right, ending on a car which enters frame ... close up on a door, door opens, someone steps out." They know every little thing. Other directors say "hmmm, see what you can come up with," and then say "that's good" or "that's not what I had in mind."



Storyboards are a handy, visual guideline used by everyone — the director, the camera crew, the editors and the special-effects crew.

COSTUMES & PROSTHETICS DESIGN

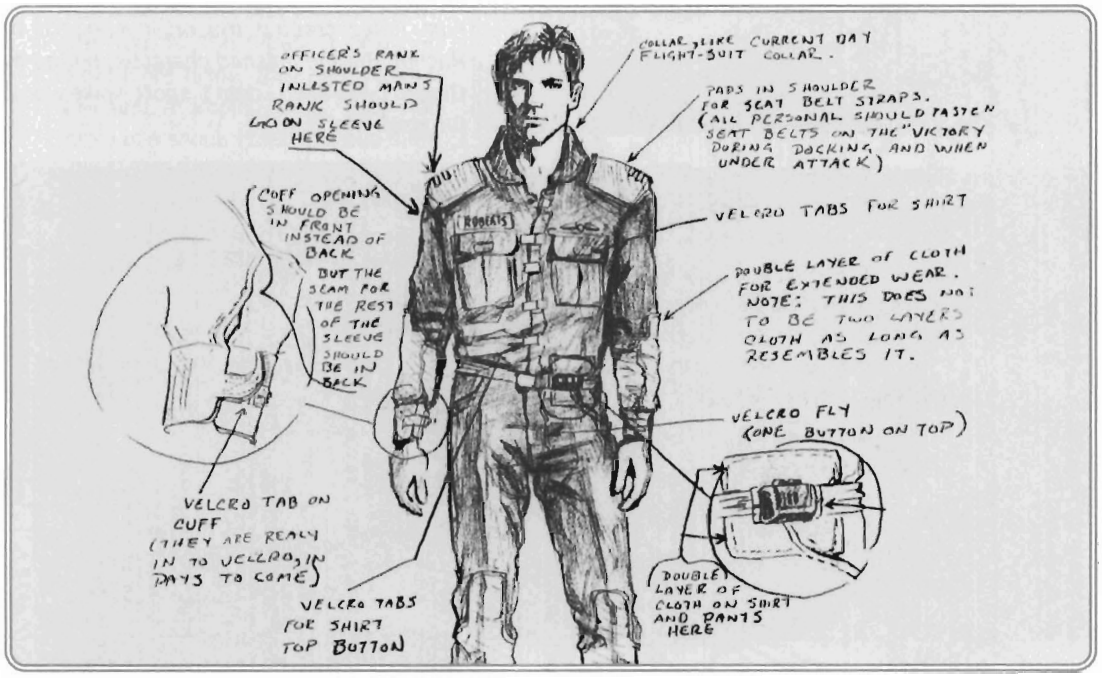
The Texas Film Commission led ORIGIN to Crista Schleuteman, who conveniently worked in Austin. After Chris Douglas, the Art Director, had designed the outfits and the colors were chosen, she made the costumes. They were originally sewn with only general sizes in mind, and the outfits were later altered to fit the actors by an on-site tailor.

Designing the Kilrathi was a big problem. While Chris Douglas put together sketches of the Kilrathi, Adam Foshko was searching the West Coast for someone who had a good track record in animatronics. They found Precision Effects, who had previously done *The Abyss*, and had them build the Kilrathi.

CHRIS DOUGLAS, ART DIRECTOR

Q: Had you ever designed costumes before?

CD: Not real ones. It was a big unknown when we set out to do it. I didn't know anything about the actual construction part of clothing, or how to make an actual uniform that was intended to be worn, instead of just looking good as a picture. Crista Schleuteman helped us out. We would work something up and she would say "well, that isn't going to work." For instance, the original designs for the Terran uniform had thick padding going from the wrists up the arms or going up the legs from the boots. It didn't want to fold right or lay over right. Then there were lots of little things, like having buckles where buckles didn't work or rearranging pleats.



Though costuming isn't in any ORIGIN job description, Chris Douglas found himself pondering the relative merits of buckles and velcro tabs.

Q: How did you go about designing the costumes?

CD: For the Kilrathi clothes, I wanted to reflect a little bit of the way the ships looked—a Kilrathi feel. The original idea was that I wanted the Kilrathi aesthetics to be primitive. In my artificial history for the Kilrathi, they never had a renaissance period on Kilrah. Their *entire* history never had a era of peace where they developed art or aesthetics. They had been fighting and killing each other from the minute they developed intelligence. Kilrah was in constant war and tribal battles. They had been fighting, with warlords building clans until about a century ago when one warlord finally consolidated his rule. Then they turned their interest outside because all they had ever done was fight and conquer. They didn't do anything else. Peace wasn't even something that would cross their minds. When they finished one war they would think "who do we conquer now?" They would never think "oh good, we're done with a war, now we can just sit and relax." They'd never honed rules of perspective and aesthetic composition. They're super-advanced technologically, but not aesthetically. The only cues they would have would be to make something look aggressive. They would have spikes, tooth necklaces, maybe one arm would have a personal computer and the other would have ears of vanquished foes. It would be a mix of Zulu warriors and super space-age tech. At some point in the arduous process of getting them built, that didn't come through at all. We could have done something a lot more striking with more time...and money.

We got to the point when there was a big rush to start building them. When we finally found the people who could do them, we had to make a bid and get them done *now*.

Alan Perez created the original sketch of Rachel. But the finished character, played by Ginger Lynn Allen, didn't sport spikes or a futuristic Marlboro!

Q: Were they not what you had anticipated?

CD: Some of the colors that I'd originally intended were changed. They came out being bright colors, which in retrospect was probably good because it is easier for the computer to compress colors with more contrast. My original plan for Thrakhath was that he would be dark and moody. Dark red and gray would have been more menacing. However, the materials they could get readily—and they needed huge amounts of cloth—were in bright blues and bright reds. The materials were more complex than I had imagined. They wanted a specific kind of material that would drape across the bodies, without looking stiff, that would look good on camera and that wouldn't be too shiny for the greenscreen. My dark red and light gray weren't two of the colors available in those materials. It couldn't be helped.

The Kilrathi themselves were a completely different problem. We had to design the creatures as well as the clothes they wore. The Kilrathi we got at the end resemble, but don't match very closely, the original conceptual design. One of the biggest things was the prosthetics. There's a kind of skull that these guys make that has servos that move the eyes and the mouth and all that. It already has a set shape, and you can't deviate from it. The Kilrathi I designed were more feline, they had a jutting jaw and a sloping skull. They had more of a snout. I tried to make them more alien looking, too. But the servos couldn't make the jaw stick out. If I had known that from the beginning I would have done it a little differently. It was another one of those things where you have to design it first and then figure out how you can create it.

Prosthetic devices played a large role as the Kilrathi sketches evolved into virtual costumes. Because of the servos, the jutting snout had to be shortened considerably.

SHOOT PREPARATION

Donna Burkons, in addition to being the Story Editor, was the L.A. producer. In that capacity, she found a variety of stages in California and had Chris Roberts, Adam Foshko and Richard Johnson fly over to look at them. There were certain constraints: it had to be large enough to fit the scope of some of the scenes, had to have a great deal of electrical power and had to be large enough to fit at least one crane. There had to be a section that could be set aside for the creatures, plus it had to be able to house the Ultimatte operations. That meant there had to be a Hard Cyc--which is a background that merges the floor to the wall, on three sides, with no sharp break. On top of everything else, travel time for the actors had to be taken into account.

DONNA BURKONS, L.A. PRODUCER

Q: How did you get started in all this?

DB: I was brought on the project to help Chris integrate motion picture quality writing and production values with exciting gameplay. With my extensive studio and production background, I knew that the right writers and a good film crew could make Chris' vision of *Wing Commander III* a reality.

All good films start with a good story and that's where we began. I contacted top Hollywood agents and managers and worked with Chris to choose the best writers for the project. Once our writers--Frank de Palma and Terry Borst--were on board, the story was worked out and the script writing process began.

With the clock ticking, we pushed forward into pre-production. We hired a Hollywood casting company. Chris was specific and knew what type of actor he wanted for each role. Then the Production Manager, Pam Auer, and the department heads were hired. These included: Director of Photography, Virgil Harper; Art Director, Cherie Baker; Post-Production Editor, Phil Gessert, etc. The department heads in turn hired crew members to support them on the set.

Q: What would you say was one of your biggest concerns?

DB: Budgeting is always a huge part of the whole process. Of course you always try to lock down the budget, but with any film project there are bound to be unforeseen costs that arise during production.

Something as simple as paint, for example. We talked to the greenscreen people and found that we'd probably have to paint once or twice--but instead we discovered that the floor had to be painted five or six times with special, expensive paint. Then you needed extra blowers to dry it overnight.

But when all is said and done, *Wing Commander III* looks like a big budget feature film because we didn't scrimp on the caliber of our cast, crew or equipment.

PAM AUER, PRODUCTION MANAGER

Like Donna Burkons, Pam also spends her every moment maintaining constant control of "details," from trash cans to living arrangements. Rarely seen without her walkie-talkie, she is also constantly using the phone to keep on top of the situation. Although a genuinely sweet person, the crew quickly learned that she has a no-nonsense attitude about professionalism and competence.

Q: What is a Production Manager?

PA: The Production Manager is the one who's in charge of all the details that go into the shooting of the video. I figured out what equipment and crew was needed, where we could find them and how we got them where they were supposed to be. I found all the bio's and credits for experienced crew. Then the director and Executive Producer called and talked to them and made the final decision on who to use.

Q: Was it any harder to find cast and crew for a computer game than for a movie?

PA: Actually it was the same as a movie--the greenscreen and interactivity were the only differences. We started with a director who knew exactly what he wanted. Then we hired the Director of Photography. Chris wanted people who had done feature film—so the Director of Photography was very important. Virgil had done beautiful picture work. Harry Jarvis, our wonderful First Assistant Director, was the next person hired. He took the script and the amount of days we had budgeted and worked out a schedule of when we were going to shoot which scenes. He had to juggle the "day out of days" for the cast, and make sure it was the most economical way to shoot. On the set he made sure everyone knew what scenes were being shot.

Bob Kertesz, the Ultimatte artist extraordinaire, was also a key player in pre-production. He made sure that we knew what we could and could not do.

We also needed an Art Director. Cherie Baker was the only real choice for greenscreen work. Chris Douglas had already done the artwork so she did less concept, but she made it all work for the camera ... what the dimensions and depth needed to look like. She worked with Chris D. to make it look real on the set. She also figured out what pieces and floors would be real and which would be better off just as computer graphics. Several things were real—the lockers, the bunks, the bar and bar glasses.

Of course Donna was already in place. She was in charge of overseeing all script changes, tightening up dialogue, deciding what scenes were going to be where. As the Executive Producer, she had the bigger picture.

Let's see ... we had a good script supervisor. She was the person who had to know every little frame of tape, where it went, what it was shot for and where it belonged in the script. She also had responsibility over the continuity. She had to make sure it all matched and that the words were mostly correct. If the actors didn't say the right words, it might have given the player the wrong idea--that is especially important in an interactive scenario. She took notes that went directly to the editor, who used them to know when the director liked the take and at what point he was going to pick up the

scene. What was amazing was she did all that at the same time.

And I was in charge of the details. Even one small little thing like the head of a camera not being there, it means that you can't mount the camera on the dolly and the shot can't be done. I had a lot of lists to make sure that everything was there.

Q: What are some of the most important things to keep on top of?

PA: People stuff. We had top-of-the-line makeup and hair people -- that was important. Actors really care about makeup and hair. They often wind up asking for the makeup and hair people to be replaced. It cost a little more, but we started with the best ones. The actors were ecstatic when they saw who was doing it. We had no complaints about the way anyone looked.

We had lunch catered by various people -- all of them very good. We also had a "craft service" table. Craft service is a continuous buffet. It's an easy way to gain 15 pounds. I always tried to have a lot of food and drink around. Drink was especially important because people got hot working on the set. Craft services kept people happy. When we were shooting, people had to stay where they were supposed to be, so the snacks were usually bite-size or something you could carry in your hand. The crew couldn't go anywhere ... they were trapped there until they were released.

Q: Were the hours that long?

PA: It wasn't like regular work hours—it never is, really. The only problem was because of the volume of the material, we went overtime. We should have had two or three more days, but we were trying to shoot within budget by scheduling ten- to twelve-hour days. Instead we went into sixteen-, eighteen-, nineteen-hour days. Remember, only the stars had places to lie down. Everyone got two meal breaks, but those are still very long hours to work. People were in a good mood anyway - the director set the tone and he was very upbeat.

Q: What problems did you encounter?

PA: A large problem was that the whole production was all one big special effect shot, with no practical set to speak of. There was some practical flooring in the throne room and a few other places, but 98% of it was greenscreen. In that situation, the actors never know where to look. It's very complicated, and the entire production was like that. No matter how much we planned, logistically it was a huge task to try and get 100 people all thinking on the same wavelength. Everyone had to be punctual, or the day went into overtime. Perhaps something wasn't quite done or something bizarre would crop up.

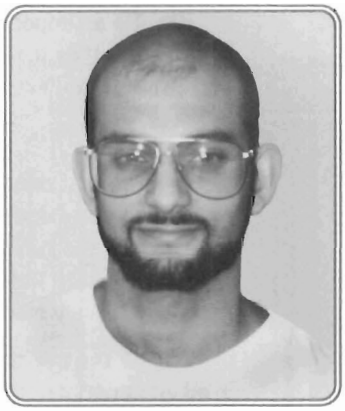
Also, getting the scene—the actual background - - rendered in time for the shoot was unexpectedly difficult. The backdrops needed to be ready so that Chris Roberts and other people, not to mention the Director of Photography, could see what the shot was supposed to look like. If the background is hazy and dark, but the people are lit-up like they're standing under a floodlight, the final effect is going to be strange. Simply getting the background and actors to match up was a big problem.

JEAN-MARC CHEMLA AND PREM KRISHNAN, ASSOCIATE PRODUCERS

The single most apparent thing these two men have in common are the menacing piles of papers that have their desks surrounded. Utter chaos is kept at bay behind binder clips and manila folders.

Q: What does an Associate Producer do?

Jean-Marc Chemla



Prem Krishnan

PK: The producer spends a lot of time representing the project. He'll go to a meeting and say "this is our project, give us money," or "this is our project, please don't cut our funding." or "this is our project, we'd really like you to do your work." He does the weekly, monthly, global issues. Someone needs to take care of the daily things like "my hard drive crashed, and I need a new one." The AP will track down a hard drive. In other words, he is an assistant (to the producer) with producer-like functions. He's the producer when the producer is not there.

Given that Chris was not in Austin for about half of the game development, that was a lot of work. When he was gone for three months, I was basically Chris Roberts, Producer, for this area. There were certain things I couldn't do, of course, and I'd give him a call, and he'd send mail to the proper people. In the meanwhile I was going to the meetings as his representative to say "we're on schedule."

JMC: Everything that is necessary to getting the job done—from getting breakfast for people that have been working all night to getting dinner for people who are hungry after a long day. We get hardware, software and other resources so people can get their jobs done as fast as possible.

PK: Also, whenever there were things that were administrative and not particularly game-related, I did them so Chris could concentrate on game things. When ORIGIN wanted a list of people's accomplishments and objectives, I collected them and put them in a folder. That way Chris could just sit down and read them, not go hunting them down individually. After he signed them, he gave them back to me to get everyone else's signatures. I also had to do travel arrangements for a time. Travel is a nightmare.

JMC: It was more than administration, though. On the post-production side I did things like checking for continuity problems by putting the backgrounds and foregrounds together with Jennifer Ayers. That was much more interesting—challenging—than the administrative stuff. I worked the subtitling system, making sure everything worked and looked good, and with David Downing, we weaved the video with the sound. I liked the feeling of accomplishment.

Of course, the greatest feeling was when it shipped.

PRODUCTION

CREW

Part of the magic of Hollywood is that there are so many details entailed in creating a movie, it seems almost impossible for a production to be completed. The secret is hiring a good crew. When people know how to deal with any problem that could crop up in their particular areas, and deal with them quickly, only then can things proceed on schedule. Donna Burkons pulled together an assortment of professionals that kept *Wing Commander III* flowing throughout the five-and-a-half-week shoot.

KATE LEWIS, SCRIPT SUPERVISOR

When Kate Lewis is at work, she's a whirlwind of motion. A trim blonde woman, she can generally be found surrounded by huge notebooks at the Script Supervisor's table. One or more of the books will be open, with her busily transcribing while simultaneously keeping an eye on a close-by monitor, making thermal prints of scenes and listening to the actors' dialogue through her headphones.

Q: A script supervisor isn't a flashy title, but everyone I've spoken with considers it a crucial position.

KL: It's an important job. You can cost the company a lot of money if you make a mistake and they have to reshoot. I work directly with the director and the cameraman—and they don't roll if I'm not there. Unless they're mad at me.

I have three main responsibilities.

The first one is continuity. That's the big picture—the whole story. If it turns out that an actor doesn't want to say a certain line and it's important later on for Joe to know that the gun was in the closet because Mary left it there, then we're in deep trouble. I have to keep an eye on the really big picture, and also keep an eye on the tiny picture as well—what the actors are doing in each shot.

I'll start at the beginning. We shoot the master first. We shoot each scene in about ten shots. The master is the biggest shot--it encompasses the whole scene. Then we'll go back and do some two-shots of people, then some medium singles, then some close ups and inserts (inserts are tiny shots ... like fingers on buttons). While they shoot ten or thirty or even forty shots, I keep track of what physical actions the actors are doing as they say their lines. If he says "don't do that" as he lifts the gun, then I make sure that he says "don't do that" as he lifts the gun in all of the shots. I make sure they say the dialogue properly. If they don't, I check to make sure that the changes are okay. I also check continuity in terms of the wardrobe and the props and the set dressing and the hair and makeup. Each department is supposed to be keeping an eye on that, but I'm the last check. Nothing is supposed to get by me. That's when a mistake will cost money.

My second responsibility is editorial work. It's partially my responsibility that the shots should cut together seamlessly—so no one notices the cut. For instance, part of what

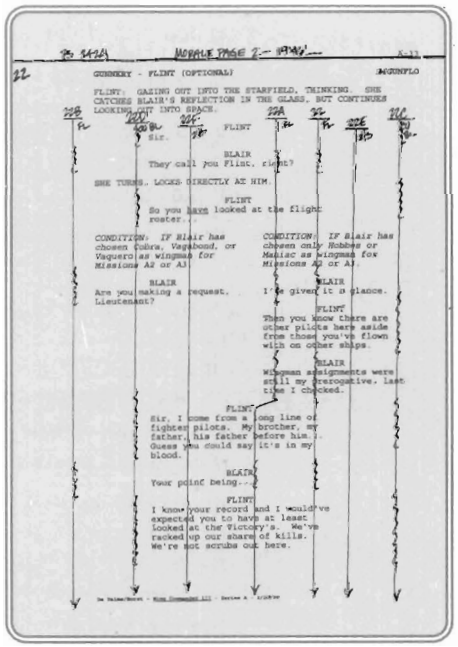
I watch for is "crossing the line." That's a mystery to a lot of people, but it's a common term. More than that, it's a big screw up if you do it. For instance, if Joe and Mary are talking to each other--and if we're to believe that they're talking to each other—Joe always has to be looking to the left and Mary always has to be looking to the right. If suddenly Joe is looking to the right and Mary is also looking to the right, they don't look like they're talking to each other anymore. It's only difficult because sometimes the actors are not looking at each other when we do the creative shots. When you get ten people around a round table, with drinks and things around them, it can get really hairy.

Plus, at any moment, the director or producer has the right to come up to me and say "how many shots are left in this scene?" and if there are five, they can say "we only have enough time for two, which two should we have to make this cut together?" I have to have that information whenever they ask, and they usually ask when I'm tired and haven't had a cup of coffee in two hours.

My third responsibility is paperwork. I keep track of everything that the camera exposes and that the sound records—what kind of film is in the camera, what the frame rate is, what filters were being used, what the lens is, what the stop is and when the camera roll is on. I do the same thing on a smaller scale for sound. I keep track of what sound we're recording, what roll it's on, if it's stereo and what's on which channel. Then I'm usually responsible for when it goes to the lab to be printed, although this was a much easier process with *Wing III*, since it was mastered onto video. We do this business with circle-takes...it's my job to circle the takes and tell the lab what to print for picture, and circle the takes on the sound report and tell the transfer house what to transfer. Those are supposed to match up at the end of each day. I'd say, in the beginning of the show before a routine has been established, about 25% of the time something doesn't jibe, or the lab screws up for you, and you'll get calls from the production company saying they asked for, but never received "take 3 of scene 149 Charlie..." and you say "so call them up and tell them to print it."

For people who are predisposed to it, it's easy. It would drive a creative person crazy, but it's not hard for me.

Of course I keep track of the script. On the lined script, each of the vertical lines represents one of the shots that I was telling you about. For example, if you look across one line of dialogue you'll see some straight lines and some squiggly lines—say there are three straight lines that go down that dialogue. That means that you have three different size shots. If the line is squiggly it means that actor is not on camera.



Script supervisors use these scribbles to track film types, frame rates, shot sizes, filters and sound channels.

I also do the opposite pages, which look like pieces of paper with two-inch square boxes on them that have scene description, takes, and whether they were any good or not. They include what we call code numbers, which are the file names of the computer-generated (CG) background plates. It was a whole new thing with the greenscreen. I had to keep track of what CG background we intended for them to use in the final composite.

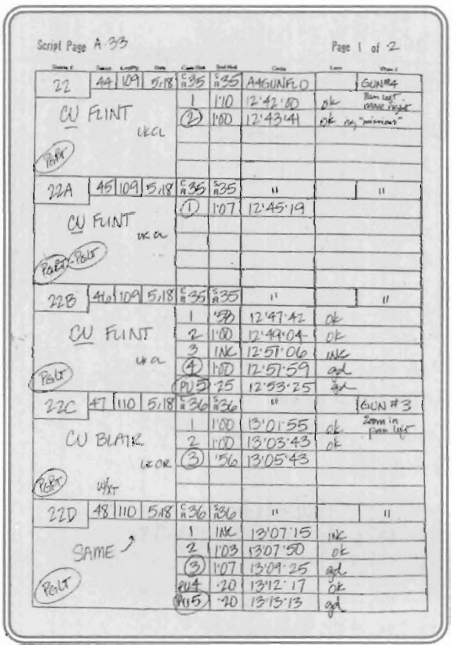
It was an amazing amount of record-keeping! I developed terrible calluses from writing so much and had to wrap mole-skin and Band-Aids on my fingers.

Q: So interactivity made your responsibilities even harder?

KL: Interactivity made keeping continuity a problem. What seems to be the real key is developing a media space map.

A media space map is a physical model that shows everybody what the story is supposed to look like and displays what's going to happen. Setting out a physical map makes it easier to know if an actor is supposed to be in flight suit or fatigues. There are about 150 jobs that need to be done, and a good crew is specifically "tuned" to their specific jobs. They may not be tuned to the big picture. Any visual, educational aid that helps people deal with the big picture—and brings everybody together on the same wavelength—is vital.

What I did was to get four 4x8 sheets of foam core. I made a different color-coded index card for each scene number. Each card had the file name number, the scene number and the CG background number, what happened, if it was a mission, where you were, and what you were doing. It was a four-foot high and thirty-two foot long chart showing us where we were. We used it a lot. Believe me, the shoot would have taken us a lot longer if we hadn't had that map. It was something we could point to and say "this goes with this, and that means that goes with that. Got it." We're not used to interactive, but I'm getting better at it all. Someday I'll be making 3-D media space maps!


Script Page A 33 Page 1 of 2

22	44	109	5:18	35	35	AAGUNFLO		GUN#4
					1	110	12:42:80	ok
	CU FLINT				2	110	12:43:41	ok
22A	45	109	5:18	35	35	"		"
	CU FLINT				1	107	12:45:19	
22B	46	109	5:18	35	35	"		"
	CU FLINT				1	110	12:47:42	ok
					2	110	12:49:04	ok
					3	INC	12:51:06	INC
					4	110	12:51:59	ok
					PU5	25	12:53:25	ok
22C	47	110	5:18	36	36	"		GUN #3
					1	100	13:01:55	ok
	CU BLAIR				2	100	13:03:43	ok
					3	106	13:05:43	
22D	48	110	5:18	36	36	"		"
	SAME				1	INC	13:07:15	INC
					2	103	13:07:50	ok
					3	107	13:09:25	ok
					PU4	20	13:12:17	ok
					PU5	20	13:15:13	ok

A media space map is a physical model that shows everybody what the story looks like and displays what's going to happen.

Another problem with interactivity is the line right before the branch. Usually when we were shooting we would say "we're going down the left side of the page." (That was "PL" in my notes.) But if the actor knew he was going to the negative side, he'd "color" the comment before the branch with a negative sound. In that case, the positive branch would sound strange. We had to keep them going down the middle of the road, *right until* the branch. You can't foreshadow. The good thing is that the actors were intrigued by the newness, so they were willing to play along. They even dealt with the greenscreen without complaint. It's a problem to act within the middle of this bright, green screen. They were really great sports.

Q: Did you enjoy interactivity?

KL: It was different. No longer are we the storytellers leading an audience along a story. We're letting the player tell *us* where *they* want to go. If the player wants to talk to Vaquero, and clicks on him, the player wants to be there, in a close up, *right now*. It's the opposite of what we're used to doing. We would never go from a wide shot to a close up. You kind of ease your way from wide shot to a two-person shot to a tight close up. In interactive, if the player clicks, it's gotta happen *now*. They're telling *us*. It takes away some of our power. That's different, editorially.

Things are changing. Let me give you my favorite example. A magazine came in to talk to Chris Roberts. The journalist wanted to know about the "CG" backgrounds, and Chris Roberts explained that back in Austin his technical people had got together and built all the sets, then put the cameras in the room and shot the sets from a number of different angles. The interviewer said, "Aha! I see! So these sets were built in Austin?" Chris was saying, "Yeah, yeah, and then we put the virtual camera in and shoot them and then we have all the angles, we use them here." The journalist then asked, "Why don't you just build the sets here, in Los Angeles?" And Chris replied, "We have all of our stuff, our shop, in Austin. It's just easier for us to do it there. It's more cost-effective." The interviewer responded, "But you could build them all from scratch here, and shoot from a real stage and not have to do greenscreen." ... It's a sign of change that they both say the same things, but are talking about totally different concepts. They thought they understood each other.

HARRY JARVIS, FIRST ASSISTANT DIRECTOR

In a production as large as *Wing Commander* there needed to be someone in charge of scheduling all the different elements. With each scene that needed to be shot there were numerous people involved. There was a real monetary danger in letting anything slip by unnoticed or unattended. Harry Jarvis, the first assistant director, kept everything moving smoothly. When an actor had to get all his scenes shot in one day, but his set wouldn't be ready until next Tuesday, Jarvis was the one who made certain everything fell into place.

Q: How did you keep something this big from collapsing under its own weight?

HJ: Someone had to schedule the show in the time allotted. I worked closely with Chris Roberts and the Director of Photography. I was the one who yelled "roll" and "cut." I was on the set, running the set, making sure that everything was going smoothly—that everything was set up properly. The more everybody knew, the better.

I made sure people knew what was coming up so they could be ready on time

Every day we put together a callsheet. A callsheet lists what order the scenes are going to be, who's in it and what time they have to come in. Every shot is a little different—especially when it is an effect shot. How long it will take to rig each effect varies. I needed to know, when we did two takes, how long it would be to do the second take, how long it would take to re-rig it and if we could be shooting something else at the same time. I kept track of a general overview—what effects were happening,

props, special equipment like cameras and cranes that we didn't need to have on hand all the time. People had to know what to order and prep for the next day. They also needed to see what was happening in the next couple of days, so they could prepare for getting them on the set. Every department was its own entity—and any communication with another department was done through me, the Assistant Director. That's what an Assistant Director does to make everything work, we keep everyone communicating. It's all a matter of making sure the left hand knows what the right hand is doing.

Q: Was it easier or harder with an interactive movie?

HJ. Interactive is different from film. Normally there would be a set with walls and floors. You set the camera, and if you need a different angle, you move the camera and leave the lighting where it is. For computer-generated sets, the camera doesn't move because it has to look at the green wall all the time. So if you want to go from a shot where you are looking over someone's right shoulder to looking over his left shoulder, you have to spin the universe around the camera, lights included. Sometimes we had to explain to the actors and lighting crew what was going on. Plus there are no reference points—you have to say, "imagine that there is a window behind your left shoulder. Now turn slowly—the window is still there behind your shoulder, but just turn your body." Actors aren't used to that. Hamill figured it out, and could explain it to the others, sometimes he had to just say, "Trust me, it'll work."

BOB KERTESZ, ULTIMATTE OPERATOR

Q: What is an "Ultimatte"?

BK: Ultimatte is both the actual physical box, and the electronic equipment that works with the box. It captures two images—one from the camera and a secondary image that can come from a computer or a tape playback or another camera. Whatever the first camera sees green, it replaces with the image from the other video source. That's the basis.

In addition to that it generates an "alpha channel," which is a black and white image of the object on the green. The object is a white silhouette, and everywhere there is green is black background. The alpha channel is recorded separately. If someone changes his mind about the background, he can use the alpha channel as a "hole-cutter" to replace the background with another background by taking the actor and objects as an isolated element.

Q: What was the trickiest part about shooting *Wing III* on an Ultimatte?

BK: We always had to keep in mind that the lighting on the subject has to be the same as the background. That is what makes the actors actually look that they are *there*. If there was a light coming from camera right in the graphic image, the light on the talent had to come from the right. Also, there could be no color on the foreground that is the same as the background... it would record as a hole.

We had to be careful about where shadows fell. We could make the actors' shadows fall on the background, but the background objects' shadows had to be pointing in the same direction. In general, also, we had to be careful that people did not look like cardboard cutouts. For example, an actor's hair could look like a "helmet." It couldn't be a round sphere around a face—details had to show through.

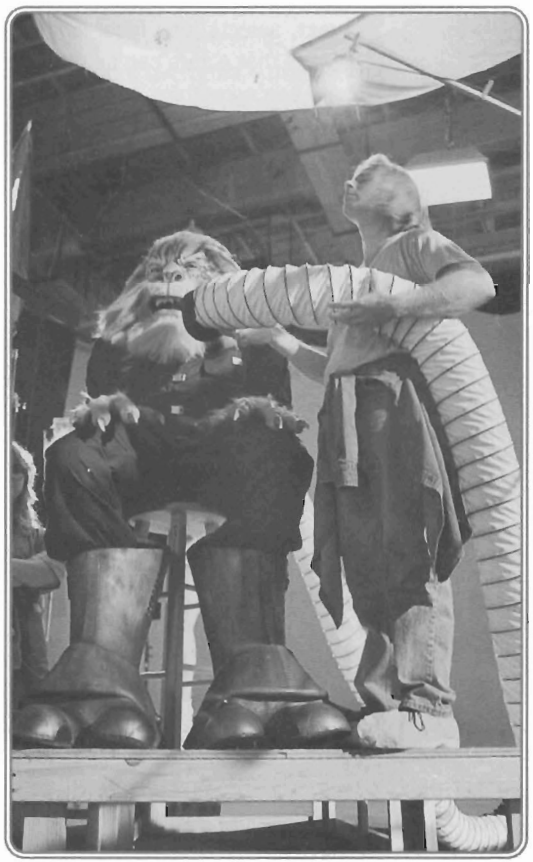
Q: What other things did you have to keep in mind?

BK: That the paint held out. We marched bands of people and equipment across it, cranes and stuff were crawling all over it—it was bound to get scuffed! Tire tracks will print through to the background, and show up on the graphics. If everyone hovered, it would be okay, but they don't ... so repainting was going to have to happen often.

There is also the lighting, always. When you're shooting a Ultimatte, you have to shoot on a Cyc—which is short for "Cyclorama." The reason you need to shoot in Cyc is because you can't have a hard angle. That would make a dark shadow that you wouldn't be able to get rid of. We curve the floor corners so we don't have any shadows. The curve starts about 2 feet above the ground, and stops curving about 2 feet from the wall. That way it shows up a solid, lighted surface.

Q: Was *Wing Commander III* a good experience?

BK: I would say so. Chris Roberts was a genuine surprise. He is a very talented director. I was astounded at how well he understood what needed to be done, considering it was his first time on any sort of major project at all. He understands the process extremely well. I thought the talent would eat him alive! A first-time director? I thought by the third or fourth day Mark Hamill would be directing from the floor. That didn't happen. He was very strong. He knew exactly what needed to be done, he grasped what the shots were, not only from an aesthetic point of view but from a technical point of view. He truly understood the processes of making a movie work, like how the camera has to be set up and how to deal with that. It was a very pleasant surprise. I thought it would be six weeks of hell, but he turned out to be very talented. I would work with him anytime, and that's a short list.



If you think summer's hot where you live, try lounging around in a heavyweight Kilrathi catsuit. Luckily, this actor had access to a portable A/C unit.

VIRGIL HARPER, DIRECTOR OF PHOTOGRAPHY

Q: What input did you have on a shoot?

VH: Once we were on the set, I had input on all the lighting. Chris Roberts had firmly in mind that he wanted the lighting to convey drama and mood. It was important for the dramatic effect and depth. I talked with both Chris Roberts and Chris Douglas about lighting schemes for the computer-generated sets—or maybe lighting *style* is a better phrase. For instance, if there was a window in the background that had sunlight rolling in, that would be part of the lighting style.

When I shoot on a real set, I can use lighting to achieve certain effects and mood. When I'm involved with a production and shooting on a practical location or real sets, I go to the location or sets before the shoot starts and come up with a lighting scheme or "look"—I'll know where lights should be placed and what the mood should be. I have the option on the set to change the lighting. With the computer-generated stuff, the lighting was already drawn into the set. So instead I'd go to Chris Douglas and say "I can use a motivational light at this location to make the character stand out." In shooting on greenscreen, motivational rim lighting helps to keep the cursed green edge from appearing around the actors.

A Director of Photography is a kind of director. The real director has the farseeing vision. The DP is the person who comes up with lighting that fits the director's vision of the project, selects lens focal lengths and compositions that enhance the scene, suggesting ways that actors can be placed in the shot to make the scene more interesting to watch. If I see something on the monitor, I have the privilege to suggest that if an actor walked to a certain point or moved a certain way, it would make the scene work better. It's always good to have a working relationship with the director, as I did with Chris Roberts, to be able to suggest things that would help the scene work better.

I was also there to help technically—to suggest what focal length lenses would help enhance the scene. We had some drawbacks because we were working in a matte situation where we have to matte the two images together—we had to cut mattes. The sharper the focus on the actors, the easier it is to cut the matte around them... you don't get a fuzzy tear or lighting thing that won't work right. That limitation meant we couldn't get crazy with any long lenses. We couldn't have one person really soft in foreground, and someone farther background sharp, or vice versa, like one does in films in over the shoulder twos or raking shots. Instead we had to keep both people in the scene as sharp as possible. In greenscreen, a strong light also tends to keep a green edge from appearing around the characters. We had to design our shots so that the focus worked that way.

Before each scene, the production crew had to check every detail, from the camera angles to the costumes and greenscreen backdrops.

Q: Did you ever order that the background be changed?

VH: A lot of times the sets would be off in comparison to the way we decided to shoot the actors on the stage. The actor just didn't look right in the computer-generated set, or the lighting where the actors stood would be wrong. In that case I would call the artists over and say "I really need a light right here. Do you see where the talent is standing? It looks dead." Then they would go render a new angle of the set or place additional motivational light sources that would make the images work together. It was like having an additional crew working with me.

Storyboarding each scene out prior to shooting was a great idea on Chris Roberts' part—it was very handy. Marc Baird had already sketched out a lot of things that Chris Roberts had in mind, so I had a good idea where Chris was going to place a lot of actors. It help me see where there would be problems.

For example, Tolwyn's office is quite large. I told Chris Douglas I could see there was going to be a lighting problem. I didn't know how I was going to get that scene lit. I needed something changed. For example, Tolwyn was at his desk and was going to walk to a console sitting behind the desk, straight away from camera, farther into the set. I said if we could have him walk to camera—to a fabricated console in *foreground*—I could put a light on him from the console. I needed some light spots on the floor so that I could have them walk through pools of lighting. Chris Douglas was beginning to catch onto what I do, and what needed to be done.

There were lots of things. In the Barracks, there was sashwork overhead—that evolved from my saying "give me a grid pattern over each bunk," and Chris Douglas coming up with a whole overhead grid. Same thing in the shuttle. Those little grid pieces over the passengers—that red cargo-net pattern with the red light up above—that was something we worked out together.

In the Briefing room, Chris Douglas gave me little spotlights that rimmed Jason Bernard and the admiral. Same in the Bridge area—the admiral's hair just *explodes* white. Originally, there was no motivational light in there, but I like to see a background source for the light that is on the actors. We put spotlights in the ceiling and over doors. Those lights were great ways to put rim-light around people.

Q: What was the biggest challenge?

VH: The hardest thing to light and get any mood into was the Flight Deck. It has a high ceiling. If you look at the Flight Deck, it's very bright in the wide shot—but when Hamill confronts Flash, for example, we get into mood lighting. We put some shadow slashes across their faces that worked pretty well. The idea came from Chris Roberts. He said to play it for mood, and that's what we did—as much as possible.

ACTORS

Of course, no matter how much time and effort is spent working on art, game dynamics and organization, the first thing that people notice in an interactive movie is the "movie" part. This is especially true when the player sees his own character on the monitor, walking and interacting with other characters. The acting carries it all.

MARK HAMILL, "BLAIR"

Q: How was interactive different?

MH: I had already done one interactive game — voice-over only — and I approached that one just like I would any animated project. It was *Gabriel Knight*. When my agent said there was another interactive game, I immediately thought of the same thing. You go in a studio, you read the lines, you don't memorize ... you certainly don't perform it. I don't know at what point I realized it was going to be live action. I think I learned from a meeting with Chris Roberts. When I met him, I was very intrigued by it.

I've been in the business for twenty years. You look for ways to keep fresh. This was certainly something that I responded to. I've always loved games, puzzles, 3-D movies, etc. I'm saying this because I'm not coming from a gamers' background at all ... my kids have cartridge-type games, that's as close as we come. Even though we have a computer, we don't really have a lot of computer-type games. But it sounded good. I just thought Chris Roberts was the ultimate *auteur*. He designed the games, he directed the piece.

One of the major challenges in greenscreen acting is to avoid imaginary walls and furniture during filming. Here, Mark Hamill and Jason Bernard take a breather as they survey the last take on video.

Q: What attracted you about the character Blair?

MH: Initially Chris offered me the Maniac role. I thought that was great. It wasn't much work, but the reason I went to Broadway was to play character roles, and that character would certainly be unexpected for me. When Tom Wilson became available, he seemed so much more right for the part—so they asked me to play Blair. I was kind of looking forward to playing comedy, and Blair certainly isn't a barrel of laughs. Then I thought, if I'm going to play Blair—the player's character—it would be so much more hands-on. I'd be there every day. I thought, "I should try this. Maybe I won't like it, maybe I will." As it turned out, I really, really enjoyed it. It turned out to be a great bunch. We lucked-out in terms of cast. Most of the actors who came on the set had certain trepidations. It's a fear of the unknown. We know what's expected of us if we're doing a television show or movie or play. You worry if you're going to be able to do all the variations on the scenario. You don't want to get up and make a fool of yourself in front of a hundred people. When I was doing *Gabriel Knight*, I had the lines right in front of me as you do in animation. You don't have to memorize in animation unless you're looping and you don't want to be looking at a page. In *Wing Commander*, after I had been there for a week, I was already the old-timer. The new actors came in and didn't know what they thought about all this. I could be reassuring. It was more like a normal movie experience than it was unlike it ... except that you would get a print, and everybody was happy, and then you would have to do the alternative column. It felt sort of schizophrenic in a way. There are so many variations of what you're supposed to accomplish.

I remember laughing a lot as things got rolling. Of course they cut all that out. Tom Wilson particularly, and Malcolm MacDowell were very funny. We had a good time.

TOM WILSON, "MANIAC"

Q: How did you feel about doing an interactive movie?

TW: It was great fun, we had a ball. Mark and I and the actors, and even the technical people got into the swing of things. It was interesting.

There wasn't a lot new to me because I had worked in the *Back to the Future* films. I'm pretty accustomed to working in technically oriented sets, filled with computers and guys with big plastic pencil holders who know how to run very technical equipment. I was kind of used to that. It was very interesting to me that we did the whole project with the greenscreen behind us. None of the sets were real ... not one is real. They are all computer-generated paintings that were put on behind us. That was fascinating. We were on a soundstage in Hollywood, painted with *bright green* paint. You'd get on the set and say "what is this? A Nickelodeon show or something? Everything is bright green!" People would tap on a two-by-four that was placed right on the scene right where a keyboard would be. It was green—everything was green except the people. But on the monitors we could see all of the sets and places on the ship where the scenes were taking place.

The ever-humorous Tom Wilson (Maniac) entertains a co-worker during a short break. He compares working on Wing Commander III to his previous experiences with the Back to the Future films, which also relied on computers for special effects.

Q: Did that make it harder than usual?

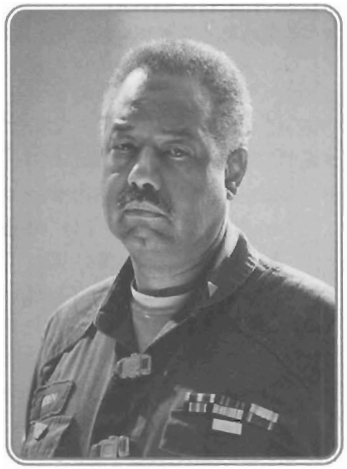
TW: You just had to use your imagination a little more. When you looked out of a window, you had to pretend that you were looking out at some vast galaxy instead of a bright green wall. They would describe to us the setting, and where we had to move ... and where we had to be careful not to move into because there was a "wall" right there. Then we could go and look at the monitors ourselves and see how it would work. It was an imagination challenge.

Mostly though, you found yourself just concentrating on other actors. That was what the scenes were all about, really. When you're acting, it's much less concentrating on where the keyboard that you're typing on is. than concentrating on the other performers and what the scene is about. They'd say "Hey! Don't step over this area, or you're behind a wall," or "Don't step over here or you'll step into one of the fighters' engines." Sometimes they would mark it on the floor or have things like green, painted two-by-fours. I pretty much concentrated on the other actors and how the scene was going.

It was sort of interesting to look into the camera and wonder if the player is going to click on me. Although we weren't really concentrating on the player, much. We were concentrating on the script and on the scenes in which we were playing. We were performing scenes with other actors, which is what it is all about.

JASON BERNARD, "COMMANDER EISEN"

Q: What's the attitude of the acting community toward the interactive community?

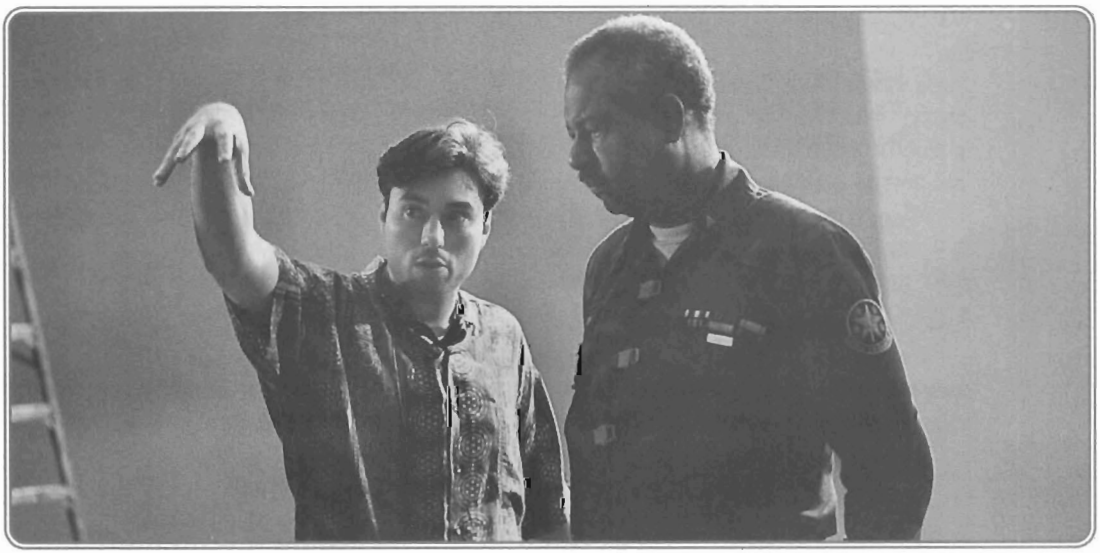


JB: There is a certain snobbery about this kind of field. That a real actor wouldn't do this kind of thing. Like there used to be a snobbery about real actors wouldn't do commercials, and now most actors are running around dying to get into commercials.

All forms of acting are basically the same, but they have different ways that you go about doing it. If you're doing a sitcom or a movie or theater—they're all different, have a different approach. The approach that we have here is that you have to be more flexible because you have to play two different ways. You can't be staunch, one way, and not be able to recover from that. You have to do the same thing on the same day.

Q: Did you have any reservations about this project?

JB: I knew that this was a first-time director and usually first-time directors are a pill. Now, I would avoid a question rather than answer it dishonestly—I think Chris Roberts is very good. I think he's good because he has in his mind what he wants, he's patient enough to show it to you and he listens to what you have to say.



Jason Bernard listens intently as Chris Roberts describes Commander Eisen's actions in the next scene. Bernard praises Chris' work as a director—quite a compliment, coming from someone who labels most first-time directors as "pills."

PYROTECHNICS

ADAM FOSHKO

Q: You did the pyrotechnic shoot?

AF: I directed the pyro shoot. Mark Galvin was producer at Dreamquest, but Robert Staadt actually produced the special effect shoot.

I had an idea of what we wanted. We went out after midnight out in the valley where Dreamquest is located. It's in the hills. They had a pyro shop in a great van out there. We went up to the van, the doors opened up and there were guys in there who had everything you could possibly want that go boom in their little wagon. They were inside their shop pouring out grains, weighing out small measurements of explosive charges, making little sacks. We could look at small, medium, large explosions, colored explosions, bits with debris, anything like that.

Then they went outside to two very large scissor lifts that could go up thirty feet or more. They took the scissor lifts up into the air and they had underneath a wooden-frame station where a high-speed camera was placed under Plexiglas. They were shooting straight up because these were space-shots—there's no gravity out there, so you couldn't have debris falling in just one direction. They had a kind of clothesline between the two scissor-lifts. One guy would take the charge, attach it to the line and wheel it out to the middle of the frame where the explosion was supposed to be. They would roll camera and we would all take cover.

Later we looked at the result. It was shot at high-speed, and we would go through it frame by frame to see if we liked it. We did a bunch of those, and there were maybe thirty keepers. Then we did gravity explosions.

They went out basically behind their office buildings. These were *big* explosions! You could *feel* the heat. They had covered the side of the building with black, and they put these little mortar bowls with the charges inside. From way back we would roll the camera and huge fireballs would go into the sky.

AUDIO

EFFECTS

There are about fifty sound effects in the *Wing III* game—from shields being hit and missile fly-bys, to bomb doors grinding open on terrain missions. Sound effects are an integral part of a game's enjoyment. (Yes, they do know that sound doesn't travel in space. They also know that silence is less fun.) The effects were created by Neno Vugrinec, an ORIGIN musician who works in a multi-windowed office that would be bright if he worked during the daytime. "I like to work at night," he asserts. "It's hard to work when you can hear five other composers creating their music through your walls. At night it's quieter and I can get more done."

NENO VUGRINEC, SOUND EFFECTS

Q: Do you make each sound effect from scratch?

NV: Every sound effect is concocted from a variety of other sounds—usually five or more are combined to make one effect. First I study the research material of the sound. Some take place in crowds, or originate from the alien culture of Kilrah.

Then I go to the sound library. It's filled with different sound effects. Most are commercially produced, and some have already been made in the past by other effects creators. I scan what sounds have already been recorded, then choose which elements are going to be incorporated into the new effect.

Q: What kind of sound elements do you put together for a space sound effect?

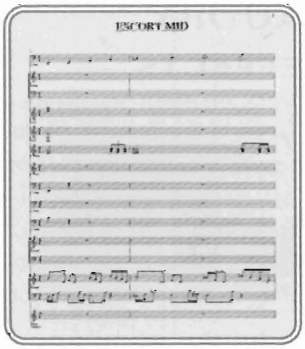
NV: For example, the sound effect of your shields being struck—there is an explosive start that blends into an electric-sounding buzz. The initial, explosive "punch" is an actual detonation, but I only take the first half-second. Then there is the "buzz" from the library's recording ... it's someone using an arc welder on some machine. I erased out all the rest of the sounds in that one. I only took the hum-sound of electricity. Then I have the sound of machine-thrown sparks—I added that in for a crackle. I layer the different parts together to make an electric sound. But if you listen ... I put in a rumble sound of thunder. There's thunder in there, too.

For a fly-by I use a lion's growl behind the scream of an overhead airplane, like a jet in the Air Force. It even has a recording from a California earthquake ... someone was in an earthquake and recorded it, and I put that rumble in the fly-by sound.

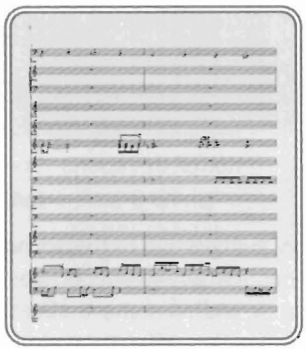
I ask the designers questions about each effect — what exactly the event is. Sometimes the elements I add are so small that the player will never even be aware of all the work that went into each particular sound—like the lion growl. Another good example: when I talked to the designers, they said that the ships were getting old and worn, so for a bomb-dropping mission I added a "rusty-squeaky" sound to the doors' pneumatic servos.

MUSIC

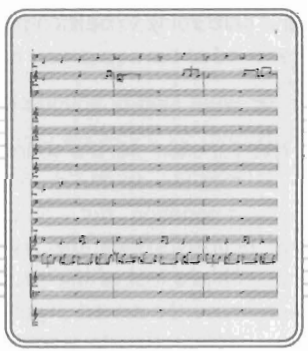
In *Wing Commander III*, interactive music is the background music that plays while you are actually flying the game. As the mood changes, the music seamlessly changes along with it. There are close to fifty different musical "themes," ranging in length from just a few seconds to a couple of minutes. Each one relates to a particular type of situation that the player may encounter during combat.



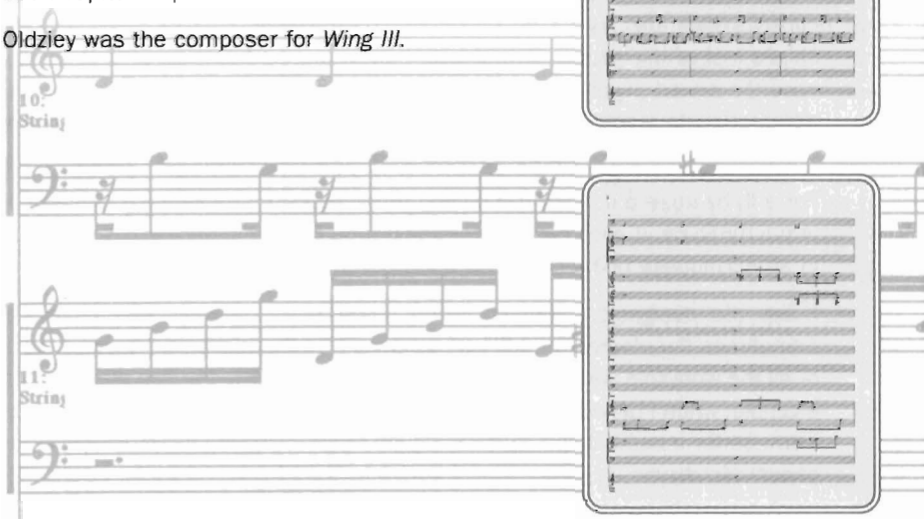
The programmers incorporated a code into the program that signals whether a situation is good or bad. The program also keeps track of how many hits you've taken, what weapons you have, how many enemies are in the area, where they are in relation to you, etc. When the situation changes, the code detects the difference and signals a switch. The music continues to the end of the measure, then adjusts to match the current scenario.



In music, a "measure" is a unit of music that is only one or two seconds long. The system waits until the end of the measure before it switches to a new music theme. The music is designed in such a way that if the feel of the two types of music is similar—such as "I'm not doing too well in combat" and "I'm hit and the enemy is on my tail"—there is no discernible break between the different musical messages. The end of one measure flows naturally into the beginning of the next measure. When the game situation changes suddenly and drastically, though, a one-measure bridge is inserted between the two different sounds. This might happen if you had been hit several times and had an enemy gunning after you, but then fired the shot that took out a Kilrathi capital ship.



George Oldziey was the composer for *Wing III*.



GEORGE OLDZIEY, COMPOSER

Q: Did you know how big the project was when you started?

GO: My first day at work, I came in and was shown to my office ... and then every half hour someone would come down and ask if I had anything. Eventually I was told what the project was. To tell the truth, I had never really played a computer game before so I didn't know what *Wing Commander* or the scope of this project was. I was composing merrily along for weeks, and little by little I was being told "You're working on *Wing Commander III*? Boy, that's really great!" It really wasn't until all the media attention that I realized that I was working on a groundbreaking project. That made it more exciting, but it's not really changing my approach to it.

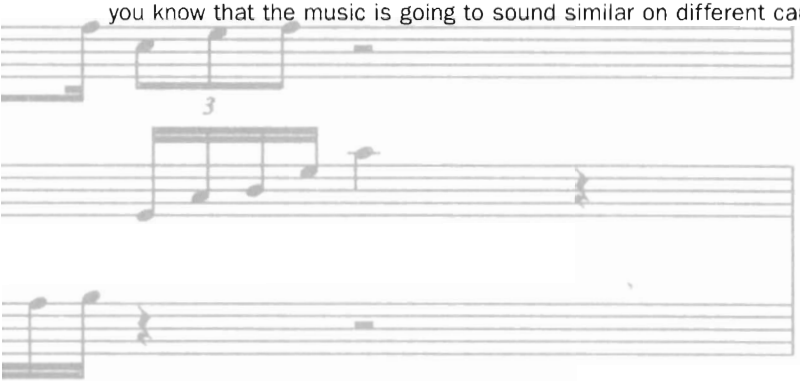
The first time I met Chris Roberts, he told me what he wanted--orchestral music; it had to be something grand. My bachelor's degree is in trumpet and I've done a lot of performing in orchestras in New York City, so I was pretty clear about how to get that kind of sound. I've also played keyboard and I've composed in lots of styles. The only fear that I have—and I love what I do here—is that I might get pigeonholed as someone who can only do an orchestral kind of music.

Q: What tools do you use to compose for the game?

GO: I have a very simple setup in my office. I have a PC with a sequencing program called *Cakewalk*, a MIDI keyboard controller—Kurzweil K 2000, which is a sampler—where I house all the orchestral sounds, and a VHS and a TV monitor that can display time code, which I use to synch the music to the video.

Q: What is General MIDI sound?

GO: General MIDI, basically, is several different companies' attempts to standardize MIDI instrumentation. If you're composing for our game (and we do support several General MIDI cards), "patch" or "sound #1" or "zero" is always going to be the same sound. In other words, zero and one are two different kinds of piano, etc. It's freeing in that you know that the music is going to sound similar on different cards.



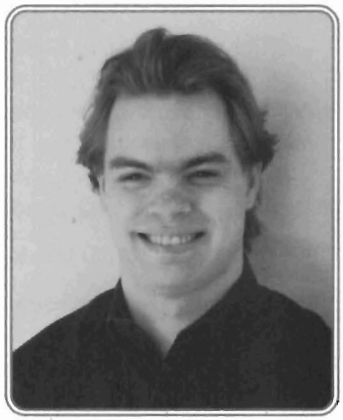
MIX DOWN AND LAYBACK

Mix down and layback are the final stages in sound. Martin Galway went to San Mateo to oversee the process. The sound effects, music, foley, art and live action sound were all re-recorded so they could cut the sound at the same time that they cut the pictures. They had all 15 or 16 different tracks, which they mixed down into a clean-sounding, finished product --the final sound.

After that, once the final sound has been created, it is usually "laid back" to the picture. Since the sound for *Wing Commander III* was automatically woven together with the game when it went onto the CD, this is not as important a stage. Regardless, it was done on the off-chance that in the future someone might need to return to the final stage.

MARTIN GALWAY, AUDIO DIRECTOR

Q: How have gamers' sound expectations changed in the last few years?



MG: In the last two or three years they've realized that sound is not just the beeps and bops of the original types of TV games. Right now they've gotten used to hearing digitized sound-effects, and we have had to work hard to improve on the last game they've heard. What they're not used to, yet, is hearing continuous digitized sound that's been made like a movie soundtrack. Once they get used to *that*, it'll be that much harder to impress them! I expect gamers will invest in better playback hardware for their machines, such as proper loudspeakers, and start to consider placement of their PCs in the home with regard to the audio.

Q: How does *Wing III* compare to its predecessors in sound?

MG: It's a step forward in every single aspect. The sound effects are a lot better. We used high-end synthesizers and computer software for the first time to make them. There's much more dialogue than in any other game that we've ever done before, especially if you add the spaceflight radio chatter to the movie script. The music is naturally much better and benefits mainly from our use of digitized sound --this allowed us to use better instruments to play the score. In terms of digital data, we use 22050 samples/sec for the first time, and also jump to 16-bit sound. Now you can really appreciate it with the hi-fi turned up loud! Data of this quality takes up 4 times the space of the kind of material we put into *Strike Commander*, for example. Speech packs would have been rather large! Good job it's a CD-ROM .... Finally, the movie sound was created using much higher production values than we've had before. We've had sit-back-and-watch visual sequences in previous games, but never before did we supply a complete, synchronized, digitized soundtrack to accompany those visuals. That makes it seem much more real. It's an important technical barrier to have crossed, too.

Q: How do you match sound to the game?

MG: The movie was made on video tape. We have video decks. We play the video from the production, and we have all our sound on a computer hard disk. We synchronize the sound to the video—we have a multi-track recorder that records the output of the computer. Once all the sound designers have built up the multi-track tapes of the scenes, we go to our mixing studio and turn it into surround stereo and mono mixes—watching the visuals for reference, of course. During the mix, the movie video is actually on a computer, too, which allows us to spend more time fiddling with the sound to get it right. It takes a very big computer to do it, a big mixer and everything else. We've been using a *lot* more equipment than we did in the original *Wing Commander*.

Q: How much sound work was required for *Wing III*?

MG: When I came on the project, I saw there was a lot of footage and realized it was all going to need a basic ambiance track in the background, since you're on a spaceship. Well, *Wing III* actually has a lot more than just that. The amount of sound detail that went into every scene would have astounded us if we'd somehow heard the finished product before we started. It's a lot more sound than you might think of at first viewing. We had to watch the picture carefully, noting down anything that makes sound, and think about what was off-camera as well, just to make you think like the camera really *was* on the bridge, for example. It's very uninspiring to watch movie footage without the proper sound, too.

Q: Has working on *Wing III* been a rewarding experience?

MG: Yes, because principally it's the biggest game in the industry, ever, so far. It's always great at ORIGIN to be working on the biggest game at the cutting edge, the game everyone in the industry is waiting to check out. I have worked on many such games here. The team members just clicked right together this time, which allowed us to dig in and get the job done almost right on schedule, something ORIGIN is famous for failing to do. We know *Wing III* will be eclipsed in the future though; no doubt by others, but hopefully by us first! *Wing III* will be remembered as the first interactive movie.

POST-PRODUCTION EDITING

Editing is simply the arrangement of the pictures that have been shot or created previously. The director and editor determine where they go and how long each picture is. They ensure that it flows and has a good feel. They smooth out the bumpy parts and make sure all the effects -- sound effects, music and animation -- are working correctly. It takes a lot of time and energy. Usually the hours are ridiculous, which was certainly the case with *Wing III*. However, the editors can be proud that they got it done, did a good job, and all within a few days of the original, optimistic estimate.

PHIL GESSERT, EDITOR

Q: What exactly is off-line editing?

PG: It's the editing stage after shooting. Someone sits for hours tweaking and twisting, and then has to get approval from all the approval stages.

Most of the time when you watch a movie you don't really see the editing. That's the whole job—to keep you unaware that we're suspending your disbelief when we switch you around the room in various positions. When I first came aboard I thought it was going to be an easy job—only one angle and a static camera. Then Chris Roberts started twisting the camera, turned it around, got different angles on people—wide shots, medium shots, close-ups. When you do a scene you do the whole scene in all those shots. There is a close-up and medium shot, a wide shot, a two-shot ... and a couple different angles of each. Then all of a sudden you end up with forty minutes worth of film for a two minute scene.

Somehow someone has to pick out the correct two minutes out of that forty. I would get it where I liked it and someone else would like it, but the director would come in and say "I like it there, but that person doesn't have the right look on his face for that part of the scene," so you change the shot. You go back and re-look at all of those takes and find one that might be better. Or maybe all the takes are bad, and you hate them, so you try taking a different angle. Instead of seeing that person -- the one whose look you didn't like -- instead you see someone else's reaction while that was taking place. There are ways around everything.

Q: How do you make all of these changes?

PG: We work on a machine called an AVID. It's a non-linear computerized machine, which is just awesome. I come from the days of editing film. There were little strips of celluloid all over the floor and all over the wall. Film was hanging everywhere. It took hours and hours to do one little thing. Now it's all computerized ... and AVID is probably the foremost non-linear editor.

Q: Is it harder to edit a computer-generated game?

PG: We had to re-do everything. It was a strenuous process for the post-production people. Every shot was a process shot. Every scene had more than one layer. In a normal movie, everything is one layer. You would go out and do a shot, and what you got was what you had. Not for us.

We had a foreground, which was the actors themselves. We had a matte pass for them—which "cut" the green background away from them so they could be plugged into a new background. Then we had a background plate, which was the room they were in. In many places we had stars outside of the windows, which entailed mattes to put the stars out there, and sometimes we had spaceships in the stars. Then there were the monitors within the rooms ... we had to put something on their screens. In some places we had 15 different layers to put together for one shot. In a three-minute scene with 18 - 20 shots it would take us four hours to do that scene in the on-line bay because were compositing layer after layer after layer.

The biggest hangup was the backgrounds. Chris Douglas' team would create a background. We'd look at the way the background matched up against the actors and realize that if you were really standing at that angle, you wouldn't be able to see that door. Chris Roberts knows the ship, in his head, like he's been living there a hundred years. He would always know when the angles were right. Then we would tweak it down and move the door to the left, or whatever.

Q: You mentioned "compositing" the backgrounds. What exactly is that?

PG: When you do compositing, you are putting the layers together. You usually start with the thing farthest in the background. In the Rec Room, for example, the background is the star field. Then there can be a space ship that gets put out there. But in order to put the spaceship out there you have to cut a hole in the stars, otherwise the stars would show through. So now you want to trim it down to a hole the size and shape of the window in the room, so you only see stars where the window is. Then you plug in the room—you have stars and room and spaceship. If there are monitors you have to cut a little hole where the monitor is so that you don't see the blank surface that is really there. You then replace it with whatever was created to be in the monitor.

Next you have to worry about the actors. We shot them against greenscreen so that we could put anything we wanted behind them. We chose green because their uniforms were blue, but there is also redscreen and bluescreen.

You put it all together in a D1 bay. That's the new, modern technique for dealing with digital-quality video. When we worked on video tape, to get something this quality you'd have to run 16 machines at the same time so that it all funneled down into one image. Digital quality is so good that you don't have the generational loss. You just bounce back and forth ... and each time you do, you add one more element.

Q: After you finish compositing, what then?

PG: Then is "on-line." On-line is final finished stage where you take the final masters. Instead of thirty hours it's only one-and-a-half.

Q: Is that it?

PG: No. There's always something more. The foley artist, for one thing. Foley artists make a living watching movies and tapping their feet. That's it. They are miracle workers. They see — on the screen — Mark Hamill walking down a set of metal stairs, onto a floor, across a floor, up a ladder and into a cockpit, and they just stand there on a little platform about two feet square, and when they finish tapping their feet it sounds just like Mark Hamill has walked those places. Then we add in the footsteps.

They also make the clothes rustle, and the sounds that you hear when people get out of chairs. They do sound effects like gunshots or body hits. All those things could be done in a foley stage. A foley stage has multiple floors with things like gravel pits and water areas. They can create the everyday sounds that a sound effects department would take forever to do ... all the one-shot sounds. Every scene in *Wing III* has foley. It's a low-level thing, but if it wasn't there, you'd notice it. When it's there and done well, you never notice. Ours was done by Pam Kahn.

Q: So foley is only sounds, never voices?

PG: Voices can be done the same way in Automatic Dialogue Replacement. Sometime someone would goof a line and just never get it right. We'd go ahead and cut it, and have the actors come back for a day to re-do lines. Some were parts the actors goofed up, but sometimes the sound man didn't notice that there was a plane flying overhead or there was too much wind that day, or whatever. They would just lip-synch to themselves. The actors stand there and wait for a little beep to sound when their parts come up. They try to make it sound just like they said it the first time. Sometimes whole movies are done that way when they don't have the time or money to get it right the first time. However, we had a great sound man and he did a good job all the way through.

Here, "put helmet on" refers to a sound effect that will be created in the studio and folded into the final product by a foley artist.

TRANSLATION

A relatively new department, Translations is housed in the recently renovated area that used to serve as the ORIGIN warehouse. Freshly painted walls and brand-new carpeting give their offices an airy lightness that is rare for the computer game company. However, their location has an annoying side-effect. The department that few people ever deal with is in offices few people have ever seen. They are as close to being invisible as is possible in a crowded building.

They barely had time to tack up their posters when they were handed the enormous task of *Wing Commander III*.

KIRSTEN VAUGHAN, TRANSLATIONS MANAGER

Q: At what stage does Translations become involved in a game?

KV: Usually we start to look at a game while it's in the Alpha stage of development. We want to get involved fairly early, before all the interfaces—such as menus—are designed. We like to have input on how the art is going to look, because a lot of foreign languages take more room.

Then the project gets a finalized script and we *really* get involved with translating it. Then, around Beta stage, we start putting the translations into the game.

Q: Was *Wing Commander III* different than the other games?

KV: Oh, yes. Before all the conversations were text only, so we did them like they were subtitles. *Wing III* is our first game to have live-action video in it. No one really realized the extent of the implication—including me. All of a sudden, not only were people talking, but we had the situation where the camera was right up in their faces, so you could see the lips move.

Something important to know is that films in Europe are dubbed professionally. The lip movements always track very well. For us to do a job that would look good to a German player—who see excellently dubbed movies every day—I felt we had to have a professional dubbing job.

Finding a professional dubbing studio was an adventure because I had no experience in that industry. We got some books that gave us a lot of information on the dubbing studios, and started calling people. Some studios are conservative and set in their ways. They would say "Computer games? What would we do with *computer games?"* Some didn't see it as a serious industry, and others would quote me something that was out of our price range. Finally I talked to a smaller studio in Munich, who thought *Wing III* sounded great. They were very cooperative.

Q: What goes on in a translation studio?

KV: In the case of *Wing III*, they did all the translation for us. Then they adapted the translation to the screen. The way that works is that they do a rough translation first, and then they cut the words down and match it to the lip movement. For example, if a word starts with an "m" or a "p," obviously the actor's lips are closed, so they try to match that with a German word that starts with an "m" or a "p" or some sort of bi-labial that would have your lips closed. They effectively re-write the whole translation to make it match the lips. They match words as much as they can. The ship name *Victory* in English is the same in German, so they try to say *Victory* at the same time as the actor on video does.

They have a big screen that shows the actor from the English version—for instance, Blair. First they watch the scene in English, and then they read from a script. On the TV there is a little bar that moves across the screen to show them about how long they have left to finish the sentence. When the bar reaches the end of the line, they know they have to stop. They're so experienced that in one or two or maybe three tries they can get the sentence to fit perfectly with the English dialogue. They did great work.

In a lot of cases we were able to get the same voice-actor that stood in for a particular actors on German television. For example, Jason Bernard, who plays Captain Eisen in *Wing Commander III*, is also a character in *Herman's Head*--we got the same voice-actor who does him in the German (dubbed) version. We had a couple of those cases—the voices we got were "known" as those actors' German voices. The quality was really incredible.

Then, when we were done with the dubbing, we got all the recordings on D1 tape and brought it to California. There we had to "mix" it all, i.e., strip out the English dialogue and replace it with German, and make sure it all still fit on the video. We worked with Murray Allen and Tony Berkeley. Then it came back to Austin.

Meanwhile my translators, Dominique Jumeau and Frank Dietz, were inputting the translated speech for the subtitles in the game. Once I came back to Austin Martin Galway started chopping the audio up into little bits and doing all the code processing audio-wise on it. Once he was done with that we had to weave the German audio-track into the movie. You had to connect the movie part with the audio part, which is called weaving. Jean-Marc Chemla and David Downing did a lot of that. As soon as that was done we could bring it down off the computer and put it into the actual game. There was a lot of stuff involved with the whole thing.

Q: Was dubbing into French any different?

KV: French dubbing we did with a pretty big studio in Paris. Dominique Jumeau cut the deal and supervised it. Basically the process is identical except for the way the French did the dubbing. They didn't use a paper script—they were even more precise than the Germans. They put the actual lines that the actors were supposed to say on the screen. The actor sees and hears the English on the screen as the French text is scrolling by at the bottom. The actor just reads off what's scrolling by and matches it to the lip movement.

To tell you the truth I couldn't see too much difference between the French and German dubbing. The German was excellent, and the French was so incredible that at times you think they are speaking French. You can't even tell that it's a dub. That's the way they do it in France—it's slightly more time consuming than the way they do it in Germany. But basically after that we went through the same process. We brought it back to California, mixed it, brought it back to Austin, did the post-production, wove it in and put it into the game.

Q: Did you run into any snags?

KV: The problem with *Wing Commander* was that everyone told me that there was about two-and-a-half hours of sound, slightly more than a normal movie. Well, it turns out it was over three hours of video material. No one really expected that—we hadn't realized that we couldn't look at it in a linear fashion. We hadn't counted all the different solutions, the options and routes you could take to different game finales. All of that, plus the in-flight communication, was somewhere between four and five hours. It took about two weeks to do it, so even though it was a lot of stuff, it went really efficiently.

While all this is going on we also had to put subtitles into the game and translate the menus. The problem with the subtitles is that we had to take into account all the length restrictions and other problems with translating a game like that. There is an extended character set. In German you have all the umlauts and in French all the accents and characters, so you need special fonts for if you are going to do a translation. Chris Douglas helped us with that.

Q: And then you were done?

KV: Not at all. As soon as we had all this together in the game, we had to test it all. Andreas Köhler, Jörg Neuman, Didier Jumeau and Karl Strand are our testers. A normal play-through takes at least two days. We managed to sign off the German within a little over a week of the English, and the French right after that. We had some American testers helping us, Jeremy Mappus and Anthony Sommers, just doing playthroughs to see if any speech was being rushed. It was sheer madness.

QUALITY ASSURANCE

After *Wing Commander III* reached the point that it was actually a game and not just an assortment of video clips and random missions, it was handed over to ORIGIN's Quality Assurance team. There Dan Orzulak was assigned to supervise the testing procedure. Every aspect of the game had to be checked: documentation, gameplay, hardware configurations and making sure the game is fun.

For a game as complicated as *Wing Commander III*, the checklist is extremely long. QA has to check that it actually works with each piece of hardware that it claims to support, including OS/2 and *Windows*, plus the sound cards, video cards, joysticks, joystick cards, etc. Then they inspect each scene's sound and music, making sure it's running correctly. Every ship must be scrutinized, to make sure nothing is incorrect. They also check all the keyboard commands. Every little thing that is in the game must be reviewed ... and can be found on the list.

The QA team works in shifts, late into the night. The game crashes often, which takes a lot of the thrill out of playing it. For the first few months, there was mostly just paperwork and swapping hardware setups in and out. When asked, though, the playtesters can usually find positive things to say ....

DAN ORZULAK, QUALITY ASSURANCE LEADER

Q: What is it like, checking the quality of a game this big?

DO: It's been a lot of work ... a lot of shift work and working late at night. It's been well worth it, though. It's a fun game. The most fun is when we can finally play the game, test it and find the bugs—especially near the end when there aren't as many bugs. Then you actually get to play the game instead of just playing for a few seconds, writing something up, rebooting the computer and starting up again.

Q: Does everyone in Product Support work on every game?

DO: No. It's one department, but we're divided into two sections. We have Customer Support, which is our phone support, and then we have the Quality Assurance side. The QA people, once they've finished a project, move over to the phones to help support the game. So right now we have forty-something employees ... or actually now that's more like 60. We have about 30 in QA. I have at least eight to ten on Wing III alone. That's not counting the dubbed versions: French and German. There's also the 3DO version, which I'll have something to do with. I'm just doing the preliminary stuff on that.

Q: When you say the game is going to ship on a certain date, how long after it ships do you think it will be before you start getting calls?

DO: As soon as the game hits the shelves, all the people who tested the game will be moved over to the Customer Support section to field customer calls. Comparatively, though, they aren't expecting many calls. CD-ROM games are easier to install than most games, and they don't take a lot of memory. Probably the biggest thing is a lot of people will try running it through their nodes, like OS/2. People don't know how their systems are set up, or that it requires a lot more memory and probably a different setup through *Windows*. We'll probably have to help them do that.

Q: What's the most fun about your job?

DO: The people we have working in our department are really good people. Our manager and supervisors have made sure. I mean, they've hired some really good people. It's just a fun place to work.

Back row (left to right): Jeremy Mappus, James Flores, Brian Wachhaus, Kevin Kushner, Todd Wachhaus, Sean Mustakas, Reece Thornton, Anthony L. Sommers, Dominique Poumeyrol-Jumeau, Dan Orzulak, Didier Jumeau. Front row: J. Allen Brack, Bill LaCoste, David Reece, Mike Songy, Jorg Newmann, Frank Dietz. Not pictured: David Abbot, Evan Brandt, Mark Franz, Jim Hill, Andrea Köhler, Karl Strand.

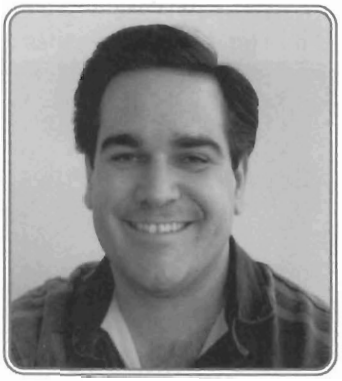
GOING TO MARKET

Like a quiet current in the background, during the last few months of development another department has also been busily working on bringing *Wing Commander III* to light. Marketing at ORIGIN takes up one half of the building's first floor. Within the green and pink walls, every inch of floorspace has been divided up into cubicles. There the people who create the rest of the game—from documents to boxes to advertisements—work to get the product out on the shelves.

MARKETING

GALEN SVANAS, PRODUCT MARKETING MANAGER

Q: Did you decide to handle *Wing III* any differently from ORIGIN's other games?



GS: From the outset we knew that *Wing Commander III* would have a different marketing scheme by virtue of the fact that it would have so many elements that were already very familiar—not only to computer players, but to everyone who has gone to the movies. So it made perfect sense that we would market it like a movie, and bring people who are very comfortable with the movie experience into the computer gaming world. That meant doing things like movie poster types of advertising, appealing to general interest media that usually covers movies and entertainment while using the crossover angle of the "new media" to make it a much more palatable story to them. Press that usually does not cover computer gaming—but does cover the movies—now has a reason to cover our industry. We recognized that from the outset and tried to tailor our whole marketing strategy around that as well.

Advertising in theaters, setting up press events with the stars, getting coverage in *Newsweek*, *USA Today*, *Forbes* and *Fortune*. It's been evident by the interest from the general press that we were on the right track.

John Rhys-Davies zeroes in on another hapless Kilrathi victim during a New York media event. Chris Roberts, Frank Savage and Jennie Evans join in, piloting from the backseat.

GRAPHICS & BOXES

CRAIG MILLER, CREATIVE SERVICES MANAGER

Q: How do you set out making a game box?

CM: We first discussed the artwork for *Wing III* with the producer, Chris Roberts. He wanted a traditional "movie-ish, *Star Wars*-ish" looking format and feel to it. So we had Sam Yeates, a traditional artist here in house, create it entirely on a Macintosh using Adobe *Photoshop*. It took Sam about a month to do the artwork, and Creative Services worked directly with him in distinguishing the exact composition of the piece. We knew what would work the best for our regular set-up boxes.

Near completion, we brought over the final format of the artwork and checked how it would look with all the associated logos for *Wing III*. There are quite a few. The biggest are the main logo for *Wing III: Heart of the Tiger* and the new ORIGIN Interactive Movie logo. Keeping all that in line and looking good is a big responsibility. The only time people notice Creative Services is when the box doesn't look good.

Q: What's your goal with a box cover?

CM: It has to have a lot of punch to it, a lot of contrast to make it jump off the shelves. When we were working with Sam, the overall image was pretty dark. We had to say okay, let's kind of sharpen this area up, lighten up here, get a little more contrast going, tone down the explosion in the background, get rid of the red up top with that arrow thing happening." Plus, we have to try not to step on the artist's toes. He's really performed an exceptional piece here—and if he had done it traditionally and was going to sell it, it would bring him a lot of money. Instead he's just getting a regular paycheck from us. We knew what would work the best for our regular set-up boxes. It was fun working with Sam because he was one my teachers at Austin Community College where I took classes—and now *I* can tell *him* how to do things.

Q: Do you only do box layout?

CM: Not really. We do everything from the box itself to everything that goes inside the box. We do all the design and color separation for the box, and the layout of all the documentation and promotional items. Plus it's hard to concentrate on *Wing III* when you have several other products going on at the same time. Every producer wants his project to get full attention. We try to prioritize how much work we're going to put into each project. It's difficult, but we manage to do a good job. Especially on *Wing III*.

DOCUMENTATION & ADVERTISING

Inside every box there is more than just a CD-ROM. There are instructions on how to install the game, fiction that introduces or explains the game's characters and environments and usually a walkthrough that guides the player through the first part of the game.

Several years ago, ORIGIN had a member of the team create the documentation that went along with the game, but that did not turn out to be a practical arrangement. People on the development team often found their time disappearing—and given the choice of missing a software deadline or missing a document deadline, the document was always put on the back burner. Understandable, perhaps, but not good for the manuals. ORIGIN hired writers to work in the Marketing department, generating install guides, manuals, advertisements and hint books. That was more than enough work to keep three full-time writers very busy.

TUESDAY FRASE, PUBLICATIONS WRITER

Q: What is a Publications Writer?

TF: The label "Publications Writer" pretty much describes what we do ... a writer in Marketing produces all the written material that's published with a game. That includes the fiction manual, the main guide that tells you how to play the game, and the installation guide. We also come up with, or at least have some input into, the "tag line" text, which is the hook that we use to catch people's attention. That's always a challenge—I never realized how much thought goes into a simple 3- or 4-word phrase. And then there are the monthly sell sheet fliers that we send out to all EA territories.

Q: How is it different from other ORIGIN writers?

TF: Being a writer in Marketing isn't at all like being a writer in Product Development. The ones on the development side are in charge of writing the actual plot line and conversations for the game. They're directly responsible for the story behind the game. The way I describe marketing writing is this: If it's in a flier, on the box, or *in* the box, we wrote it. If not, someone in PD wrote it.

Q: How do you prepare for working on a project? Was *Wing III* any different?

TF: The first thing I do when I find out that a certain project's in my lap is to research the storyline. Sometimes, this isn't anything more than visiting the producer and talking about the project. Other times, I just talk my way into an alpha or beta version of the game, then start it up on my system. Once you've played it awhile, the writing flows. You've got a handle on the tone of the game, the characters, and the gameplay, and that makes the docs a lot easier to create. Some docs are loose and casual; others are strictly technical in nature. Either way, you can't really describe the game in layman's terms until you understand what its purpose is, and what type of audience you're targeting.

Once I've learned a little bit about the fiction and purpose of the game, I start to play it. This is undoubtedly the most exciting time for me —actually it's second only to seeing the final product on the shelves. Being a writer, I always feel privileged to be able to see the game before anyone outside the company gets to.

The rest of research is different for each game. For our WWII sim, I had to read a ton of history books for the historical parts of the manual. And I *hated* history! But after visiting a museum and collecting odd articles and lots of pictures, I can truly say I enjoyed learning about the war. It was also very interesting in that I found out my grandfather (Wayne Glenn) was a *Dauntless* tailgunner aboard the carrier *Saratoga*. Now that was rewarding, learning what went on in the world when he was my age.

Sometimes I don't know enough to write intelligently about a subject, and I have to read something like *Neuromancer* or watch movies like the *Lawnmower Man*. That was the case for *System Shock*, so I had to introduce myself to world of cyberpunk.

Other games don't require much research at all. Take *Wing Commander Armada*. We decided to go for the "collage" effect and present the Terran-Kilrathi conflict from both perspectives. That was a great opportunity to be creative, and I wrote dozens of short pieces. Some were letters home, others were articles, mission briefings or log entries. It worked out really well.

Hintbook research is another matter. They're more detail-intensive, and I've had to learn to dig through MIF files, which are data files that contain a lot of code. It was pretty Greek at first, but I'm learning how to extract basic information out of the files. What kind of info? Plane stats, wingmen characteristics, what type of monsters you'll find, how they attack, and so on and so on.

And then by the time I've done all the writing, the game ships and I'm tired of playing it.

Q: With the advent of electronic-based text, how do you think your role will change as a Publications Writer?

TF: It's just like anything else —you have to adapt to survive in the market. I think there will always be print media to some extent. Who wants to quit in the middle of a game so that they can pull up an electronic copy of the playguide? At the same time, I think my role will evolve to incorporate more electronic copy. We'll have to start writing with less flourish and more for the computer screen —space will definitely come into play, because you can only fit so many words in a single frame.

Probably our first entry into electronic text will have to do with help files, like the ones you find in *Windows*-based programs. I can see how that would be useful to players. Later, I wouldn't be surprised if we start producing ref-type screens that give "quick information." And I guess ultimately, we'll ship everything electronically, even the playguide. I'm sure that our work will then become more code-oriented. And with any luck, writers will remain in the loop.

Q: What was the easiest part about working on *Wing III*? The hardest?

TF: The easiest thing? *Wing III* stayed true to the script since all the film shoots took place well before the game hit Beta. They couldn't change much in the game, other than when conversations became available, and what loadouts the ships had. All the game elements remained stable for the most part, which was a welcome change. Usually, I expect 180-degree turns on things I've already documented, but that wasn't the case. The keystrokes stayed the same, and so did the story. But I have to admit, I *still* don't know the correct missile loadouts for the fighters!

The *worst* part about being on this game was the time frame. I had just come off two simultaneous projects that shipped late, and that crunched my production time for the game docs by two-thirds or so. Luckily though, I had help from Melissa Mead and John McLean. I guess the only other problem I had was trying to pin people down for information and signoffs — if someone on the team wasn't too busy to talk to me, they were at home grabbing what few hours of sleep they could! I ended up working some odd hours and some long days.

Q: Just how closely do you interact with the actual development team? Are you a team member, or do you operate solo?

TF: Even though I'm a Publications Writer in the Marketing department, I try to cultivate good relationships with the team I'm working with. If I can convince them that I'm very much interested in learning the guts of the game, they're usually willing to help me. And I *am* genuinely interested. I've made a lot of friends at ORIGIN, and I sometimes visit other floors even when I don't need anything from anybody up there. When I do come to the team for work-related items, it's usually to get questions answered. You get really good at running stairs and catching people just as they're trying to duck out of sight!

Occasionally I can turn into a nag, especially when we're trying to get docs signed off by the team members and by QA. All in all, I think we have an interesting symbiotic relationship. I can't write without them, and they can't ship the game without docs.

Q: What's your favorite aspect of your job as a Publications Writer?

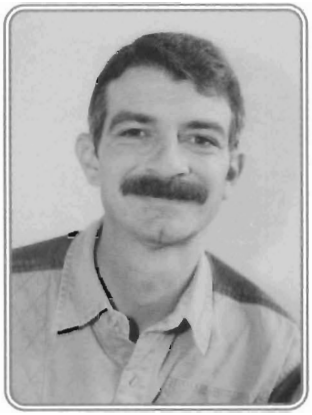
TF: Well, that's a tough one. I have lots of favorite aspects. One is that I get to switch hats, so to speak, every couple of months. I have a tendency to get bored easily with routine tasks, so it's a nice change of pace to go from a WWII flight sim to a cyberpunk point-of-view game to an interactive movie like *Wing III*. And we're usually working on more than one project at once. In the last four months, I've worked on three games and two hintbooks. That's not even counting all the ad text, sell sheets and catalogue text for upcoming games.

And the best thing about being a PW is that it's not just writing. I've had the chance to do some graphic work, and I'm learning the ins and outs of DOS, hardware, and simple code-deciphering. Hey, I can even create a boot disk without reading the install guide now!

DISTRIBUTION

MARK CHANDLER, DIRECTOR OF OPERATIONS

Q: When does your department get involved in a project?



MC: Basically, when it gets to the first Product Status Meeting—PSM— is when we start coordinating when the product is going to ship, and how many are going to go out within a certain timeframe. World-wide ship dates make it tricky. For instance, we have to get Australia's shipment done a week earlier than our domestic ship - just so we can get it through customs. There's also the fact that we ship to different hemispheres. Because they're a day ahead of us, you can actually run into the problem of having two Sundays when you ship world-wide.

Scheduling turnaround times with our suppliers is the first thing we take care of. With the current paper shortage, we have a lot of problems with keeping our prices where we want them. Three paper mills shut down about a year ago, and paper became like oil was in the '70's—they could raise the prices any way they wanted. Basically, it became more lucrative for companies to sell their paper to places other than the game industry. Something as simple as the availability of the paper could really affect our turnaround time.

Then I coordinate with the document writers, the folks in Creative Services who lay it all out, the people in Sales to make sure we have the right quantities, and with Electronic Arts in Europe and San Mateo. By the times the CD is done, we've always got nearly everything else done. The multi-page inlays that go in the front of the CD jewel case, the insert that goes in the back. Everything except the Install Guide, which is the last document to be done.

Q: How long does it take from getting the final, signed-off version of the game from QA, to having a game on the shelves?

MC: In the summer we can go from absolute zero to having a 35 to 40,000 games on the shelves in less than a week. For a huge game like *Wing Commander III*, though, we'd like to have about three weeks. The season that a game comes out really makes a difference - Christmas is always busier. Everyone plans for their number one games to come out about that time.

We'd never be able to do it if my own group weren't so responsible—without them none of this would happen. They take care of all the details, they really do. While I'm looking at the overall picture, they're down in the trenches getting it done. They make it all happen.