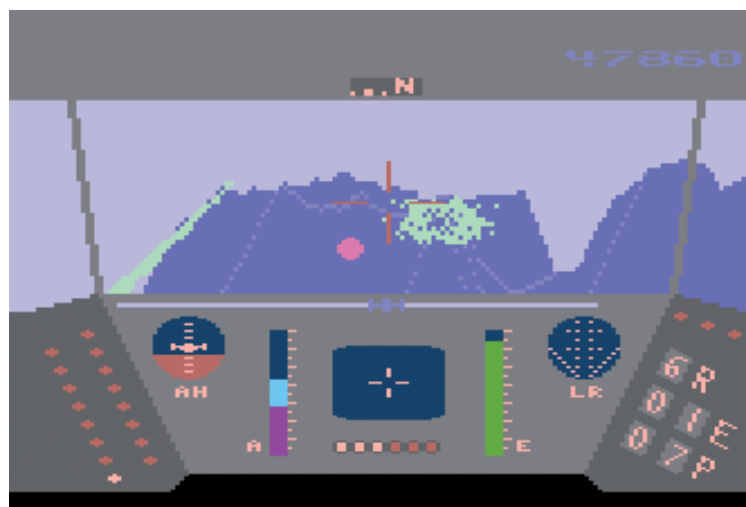


THE MAKING OF...

RESCUE ON FRACTALUS!

To commemorate this year's 25th anniversary of Lucasfilm Games (now LucasArts), original Games Group members David Fox, Charlie Kellner, Peter Langston and Gary Winnick reveal the fascinating history of their famous fractal debut. Mike Bevan ventures behind Jaggi lines to tell the story



IN THE KNOW



- » PUBLISHER: ATARI-LUCASFILM/EPYX
- » DEVELOPER: LUCASFILM GAMES
- » RELEASED: 1984 (5200), 1985 (ATARI 800 & OTHERS)
- » GENRE: RESCUE-EM-UP
- » EXPECT TO PAY: £10

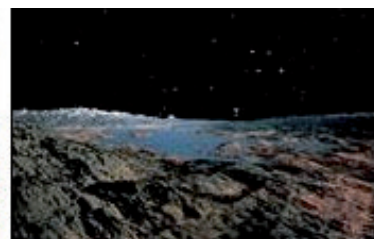


A long time ago, in an unassuming office far, far away, two Lucasfilm employees were engaged in a deeply engrossing conversation. It was September 1982, and the location was the company's computer graphics research department based in Marin County, California. Newly hired Games Group designer David Fox had found himself temporarily sharing a work space with Loren Carpenter of Lucasfilm's computer graphics division. Loren, a graphics expert, had been largely responsible for creating the 'Genesis Effect' visuals seen in the then-recent *Star Trek II: The Wrath Of Khan*. This remarkable computer-generated sequence was provided for Paramount's movie by ILM (Industrial Light & Magic). The ground-breaking piece featured a dramatic orbital sweep of a planet surface in flux, its geographic features morphing before the viewer's eyes. The driving force behind this effect was a fractal algorithm implemented by Loren. This gave the amazingly naturalistic 'feel' of blossoming seas, valleys and

mountain ranges, and the technique was so striking it was reprised in a further two *Star Trek* films.

On one of David's first few days at the company he'd been brainstorming ideas with Loren when the topic of the *Star Trek* effect had come up. "I asked Loren if he thought there was any chance that fractally generated mountains could be done on a microcomputer," remembers David. "He thought about it for a few minutes, and said he thought it might be possible. I think he came back the next day and had clear ideas of how to do it." Although not directly involved with the Games Group, his discussion with David inspired Loren, who loved a challenge, to

pursue some 'extra-curricular' research. "He borrowed an Atari 800 from us, took it home, and in a few days had taught himself 6502 assembly language, how the Atari handled graphics, and came back with a functioning demo," recalls David. Loren had achieved a real-time fractal-generated mountain range within the confines of the Atari's primitive resolution and 48K of memory. It was a revelatory moment for the newly formed Games Group team. David (later project leader on *Fractalus!*) remembers gathering around a small monitor with Games Group manager Peter Langston to view Loren's work. "We were blown away," David says. "It was running at



» The 'Genesis Effect' sequence from *Star Trek II*, with the fractal mountains that inspired *Rescue On Fractalus!* © Paramount Pictures.



» The 'launch-tube' effect when the Valkyrie blasts into space was inspired by the launch sequence from *Battlestar Galactica*.



» The transition downwards to the planet's surface was David's homage to the opening of *Star Wars: Episode IV*.



» Detail from the game's cover, with David Fox in full flight-gear awaiting rescue, and a hostile Jaggi saucer in the background.

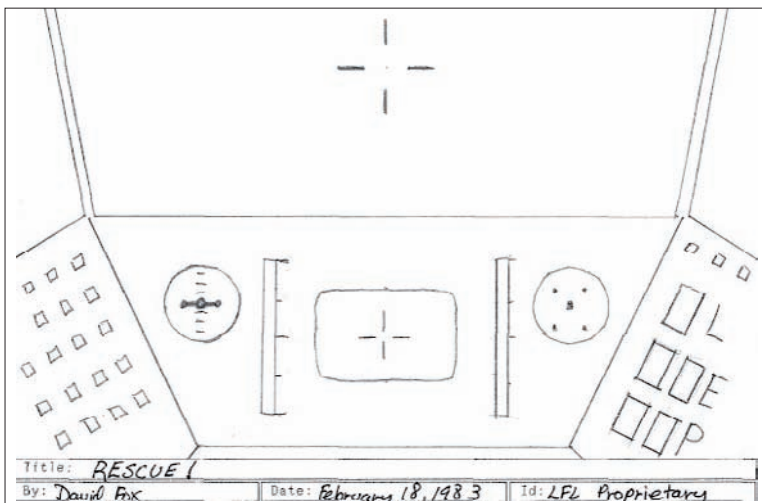
about 8-10 frames per second, and was one of the coolest things we had ever seen on a microcomputer."

Based on the success of the demo David started putting together a 'white paper' on his ideas for how Loren's fractal landscape could be utilised in a videogame. A *Star Wars* fan before working at Lucasfilm, he was keen to produce an immersive experience worthy of standing up to scrutiny alongside George Lucas's epic

blockbusters. "Seeing *Star Wars* was a transforming experience for me. I wanted to get inside that universe," says David. With the tentative title '*Rebel Rescue*', David's concept was a flight-simulator-styled first-person-perspective game where the player operated a "high-speed X-Wing-like craft" locating downed pilots on a hostile mountainous planet. Ironically, as the rights to use *Star Wars* characters in home and arcade videogames had been awarded to Parker Brothers and Atari in a hugely profitable deal, it didn't make financial sense for Lucasfilm to use its movie licences for in-house products, so the Games Group could only use original concepts at the time. "I know we can't use *Star Wars* characters, but can we use *Star Wars* places, vehicles, weapons?" David speculated in his pitch. "Any similarities between this game and the rescue scene on the ice planet Hoth are purely coincidental," he added humorously.

Away from Marin, 1982 hadn't been a year of smooth sailing for the videogame industry. Atari had lost millions of dollars with its poor 2600 *Pac-Man* conversion, and its famously appalling *ET* licence. Lucasfilm's Games Group had been set up with \$1 million of funding from Atari, in the hope that the company's involvement might inspire the games

» David's original sketch for the Valkyrie's cockpit is near identical to the final version, and was inspired by an X-Wing cockpit.



market in the same manner it had done with cinema, and with the agreement that Atari had right of first refusal on all products. There were high expectations all round. The Games Group members were inexperienced, however, and wanted time to hone their programming and design skills. "When we started work on the games, we were calling them an experiment, one that we could use to get our feet wet and test our ability to create games," David reveals. "We called them 'throwaways', meaning that if we weren't happy with the results we'd chuck them, and not show them to Atari or anyone else, and then start on the 'keeper games', which we would show to Atari." This translated into a fairly relaxed atmosphere for the team. "We had no deadlines, so we had some space to screw up," he laughs.

David, as project leader and lead designer, was responsible for many aspects of development. One important role was designing the cockpit environment and instrumentation. "I spent a lot of time working on the HUD," he recalls. "For inspiration, I went back to *Star Wars*, wanting the feel of the

DEVELOPER HIGHLIGHTS

BALLBLAZER

SYSTEMS: ATARI 5200/800/7800, C64, APPLE II & OTHERS
YEAR: 1983

THE IDOLON (PICTURED)

SYSTEM: ATARI 5200/800, C64, APPLE II & OTHERS
YEAR: 1985

THE SECRET OF MONKEY ISLAND

SYSTEM: PC, AMIGA, ATARI ST, MAC
YEAR: 1990



INDUSTRIAL FLIGHT AND MAGIC



» (Left to Right) Gary Winnick, Charlie Kellner, David Levine, Peter Langston, Noah Falstein and Loren Carpenter.



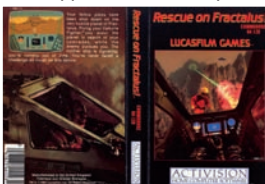
» (Left to right) Charlie, Loren and Peter, as featured in the Atari 5200 manual, with ILM's model of the Valkyrie.

Lucasfilm's famed ILM was heavily involved with designing promotional material and packaging for *Rescue On Fractalus!*, and it also helped to produce models of the Valkyrie fighter, its cockpit and the alien saucer seen in the game. It even allowed the development team to feature in a photoshoot for the game's manual, which gave the cover art a wonderfully atmospheric feel. "When we first heard that ILM was going to be doing all the images for the manual we were all really excited," says David. "And when they allowed me to be the pilot on the front and back cover, getting photographed by the same geniuses that filmed *Star Wars*, wow." The pilot's helmets worn by David and the team were actually motorcycle helmets modified for the shoot by ILM. "The helmet was spray-painted beige, and covered with parts from a model kit of a tank. It was pretty uncomfortable, but the experience was a lot of fun," he reminisces. "Even more fun than the time that I got to be one of the screaming voices of dying bad guys for *Indiana Jones And The Temple Of Doom*." And who ever said that making videogames was boring?

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LONG ROAD TO RELEASE..

In autumn 1983 demos of *Rescue On Fractalus!* and *Ballblazer* were sent to Atari's marketing department for evaluation. Unfortunately, unprotected floppies were used, and the two games soon appeared on bulletin boards across the US. No one at Atari ever owned up to the leak, but it was a blow for the Lucasfilm team. "We went from being ecstatic about the games to extremely depressed," says David. "We comforted ourselves by saying that these weren't the final games, but in reality, they were close enough that most people who played them probably wouldn't have seen the difference." Copies of the game with the titles '*Rescue Mission*' and '*Behind Jaggi Lines*' come from these pirated beta versions. Another setback was the long delay between the end of development and the actual release. After the takeover of Atari by Jack Tramiel, the licensing deal between the two companies collapsed and only the Atari 5200 version was ever released by the Atari-Lucasfilm partnership. It would be 1985 before the home computer versions were released, at which point the Atari's popularity had waned. Luckily, conversions for machines like the C64 and Apple II still sold fairly well.



» The C64 version of *Rescue On Fractalus!* was released by Activision here in the UK. That's David again, on the back cover, in ILM's cockpit mock-up.

FRACTAL FACTUALS

Loren Carpenter's fractal engine was a radical and unique solution to the problem of creating the real-time 3D landscape in *Rescue On Fractalus!*. Fractals are irregular geometric shapes composed of indefinitely repeating patterns, occurring in nature in such forms as snowflakes, coastlines and, indeed, mountain ranges. If you zoom out on a coastline, for example, you'll see the same repeated jagged complexity as you would at a much more localised scale. The fractal geometry used in the game gives the landscape a very realistic appearance with computer-generated valleys and peaks created similarly to those of a real mountain range.

instrument panel of an X-Wing. I figured if I could see the 'real thing', I'd get to see all sorts of extra details and have even more inspiration. So I set up a tour for myself of the storage area where old props were kept. I got to see an actual X-Wing cockpit." He also managed to sneak in a further *Star Wars* reference in the game's launch sequence. "Entering the atmosphere of *Fractalus* was definitely a homage to the first scene in *Episode IV*, when we pan down and see Tatooine below," he reveals.

"After a few months, when we could actually fly around with a joystick and pick up pilots we knew it was a very cool game," continues David. "But we were still close to it, so we brought in other people to show it to. As far as I can remember, everyone seemed to love it, and we began to indulge in dreams of having a big hit."

Charlie Kellner was originally brought in by David to code the game's flight dynamics and to optimise the fractal engine. "I was the fourth or fifth person to be invited to join the Lucasfilm Games Group, depending on whether you count Loren as part of it," he recalls. "The idea was already pretty well established,

"HE FLEW AROUND FOR A FEW SECONDS, TRIED PUSHING THE RED FIRE BUTTON, AND WHEN NOTHING HAPPENED ASKED, 'WHERE'S THE FIRE BUTTON?'" DAVID ON GEORGE LUCAS'S FIRST REACTION TO THE GAME

but the hardest parts of the 6502 code had yet to be written. My forte was my familiarity with high-speed drawing, math and audio on the 6502. I started with the micro code math routines that would let Loren's fractal mountains run at a reasonable speed. I also did some of the audio driver and low-level system control code, and finally wound up doing the high-speed 2D-animation drivers." However, Charlie is keen to stress the true team spirit in those pioneering early days at Lucasfilm. "Since there were no reference books to look in, we were all helping each other solve the problems the best we could," he says.

During this period Peter was busy hiring staff for the Games Group, and was also involved in the second of Lucasfilm's two titles in development, David Levine's *Ballblazer*. However, he still found time to help the *Fractalus!* team, composing the introductory music and designing some of the atmospheric sound effects. "When we were looking for a sound to use for the ship's hangar doors opening, something clicked for me and I went home and recorded my girlfriend's electric can opener opening a can of peas," says Peter. "When I played it back for David and Charlie without telling them what it was, they looked at me and said 'hangar doors.'"



» Loren Carpenter's fractal mountains perfectly captured the feel of a hostile alien world, and are still remarkably effective.

The game's working title had now become '*Behind Jaggi Lines*', an in joke by the team on the non-anti-aliased graphics, most noticeably the uneven, jagged 'struts' of the ship's cockpit.

An added bonus for the team was getting to work with George Lucas, albeit only briefly. "George met with us only once, and that was after the games were

flight manoeuvring." A weapon system was duly added, along with enemy gun emplacements on the mountain tops and suicidal alien UFOs. "The other thing George suggested was that maybe sometimes the pilot running towards the ship might actually be an alien in disguise. He wanted to know if it could jump up in front of you. We

fairly far into development," remembers David. "I demonstrated *Rescue On Fractalus!* to him, then handed him the joystick. He flew around for a few seconds, tried pushing the red fire button, and when nothing happened asked, 'Where's the fire button?' I was basically trying to create a non-violent game and didn't like the idea of shoot-'em-ups. The only way to destroy one of the enemy ships was to lure them into the side of a mountain through tricky

thought that was a great idea and Gary Winnick created the 'Jaggi' monster for us, Charlie got it to animate fast enough so the effect worked, and Peter created the scary sound when it popped up."

Gary remembers the creation of the Jaggi monster well, as it was his first commissioned task for the Games Group. "The group was looking to add an artist to the team," he explains. "David wanted an instance where the enemy aliens could disguise themselves

» The Jaggi gun turrets lurking on the mountain tops were added towards the end of development.



THE MAKING OF: RESCUE ON FRACTALUS!



» Land the Valkyrie to rescue a pilot and he'll come running and knock on your rear airlock door. Don't forget to open it.

as downed pilots as a surprise attack while you were parked on the ground. I worked on it for about a week, after which I drove up to Marin County with my completed animation on a five-and-a-quarter-inch floppy disk to deliver the files. I guess they must have been happy with the results, because they offered me a full-time position as the division's first artist/ animator soon after that." The team decided that the existence of the Jaggi monster should be deliberately kept a secret to surprise

first time, players were generally pretty complacent about playing the game."

All this subterfuge led to some rather amusing anecdotes from David. "I still get emails from people recalling their first experience with the Jaggi monster," he chuckles. "People have fallen off chairs, let out an involuntary scream that brought college dorm-mates running to see if they were okay, and kids have run out of the room crying to their mothers (I don't feel too good about that one). Often they were just too freaked out to



» Woops... Accidentally turning your ship's shields back on when a pilot approaches is a big no-no in *Fractalus!*

engine," he admits. "I learned a lot from Loren, including at least six fundamental ways of approaching 3D graphics that I'm sure I would never have thought of by myself. I was able to use those ideas to develop engines for several more games at Lucasfilm, and the knowledge has served me well ever since." Charlie's revised graphics engines would also be used for the excellent 'second-generation' fractal titles *Koronis Rift*, and *The Eidolon*, on which he was the project leader. "It was an honour to be working with such great talents, and a strong start for a career in the game industry," he remembers.

"I actually got to redo the game to some degree in 1991 while working on a location-based entertainment project (*Mirage*) at Lucasfilm," reveals David.

"It was a joint venture with Hughes Simulation, and we got to implement it using state-of-the-art image generators used in flight simulators. It was a blast. I could stay in there for hours flying around, shooting things." Respect then, to George and his 'missing' fire button.



» The Games Group sporting spiffy LFL jackets for a 1984 US Atari magazine cover.

"PEOPLE HAVE FALLEN OFF CHAIRS, LET OUT SCREAMS, AND KIDS HAVE RUN CRYING TO THEIR MOTHERS" DAVID ON THE JAGGI MONSTER'S EFFECT

players. "We convinced Atari not to tell anyone that the alien was in the game," says David. "It didn't appear in their press material, and was only hinted at in the manual. During the first few levels of gameplay, the monster never showed up. So, by the time it happened for the

play the game again for an hour or so. Many people remember the game just because of this, and that it was the only game that ever truly scared them."

Looking back on the *Fractalus!* project Charlie has no doubts about his personal highlight. "I'd have to say the fractal

» Many Jaggi died to bring you this feature.



» "The weird symbols on the Jaggi monster's shirt are the team's initials if you turn the image sideways," reveals David.

