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NEXT GENERATION

The **future** of **interactive** entertainment

April 1995

pussycat?

Atari faces the toughest fight of its 27 year history. Can Jaguar claw its way back to the top? Or is this the last of Atari's nine lives?

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Atari: from *boom to bust* — and *back again*

Throughout the history of gaming, the flared red **Atari** badge has remained an enduring fixture.

Formed in 1972 by **Nolan Bushnell**, Atari is the oldest videogame company in the world.

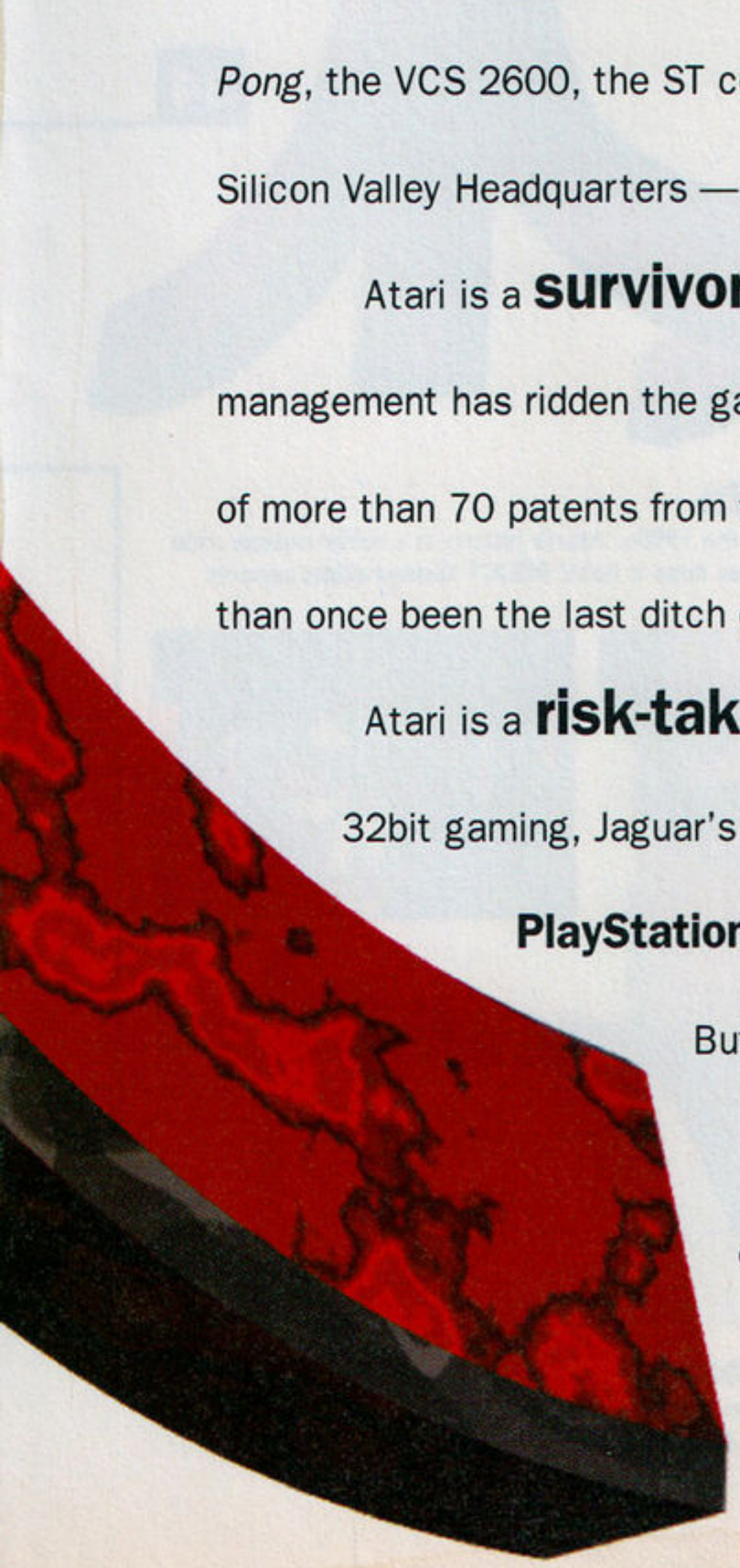
Pong, the VCS 2600, the ST computers, the Lynx and now the **Jaguar**, all have emerged from Atari's Silicon Valley Headquarters — to meet with varying degrees of success.

Atari is a **survivor**. Often the underdog, but never beaten to submission, Atari's management has ridden the gamut of fortune from **boom to bust** — and **back again**. The holder of more than 70 patents from the very dawn of videogaming, revenues from legal disputes have more than once been the last ditch defense against financial ruin.

Atari is a **risk-taker**. Attempting to preempt the mainstream's migration from 16bit to 32bit gaming, Jaguar's window of opportunity was always going to be small. And now, as **PlayStation**, **Saturn** and **Ultra 64** loom closer, this window threatens to slam shut.

But you won't hear anyone at Atari HQ speak of defeat.

It's a story **irrevocably interwowen** into the history of videogaming itself. And it begins on page 34...



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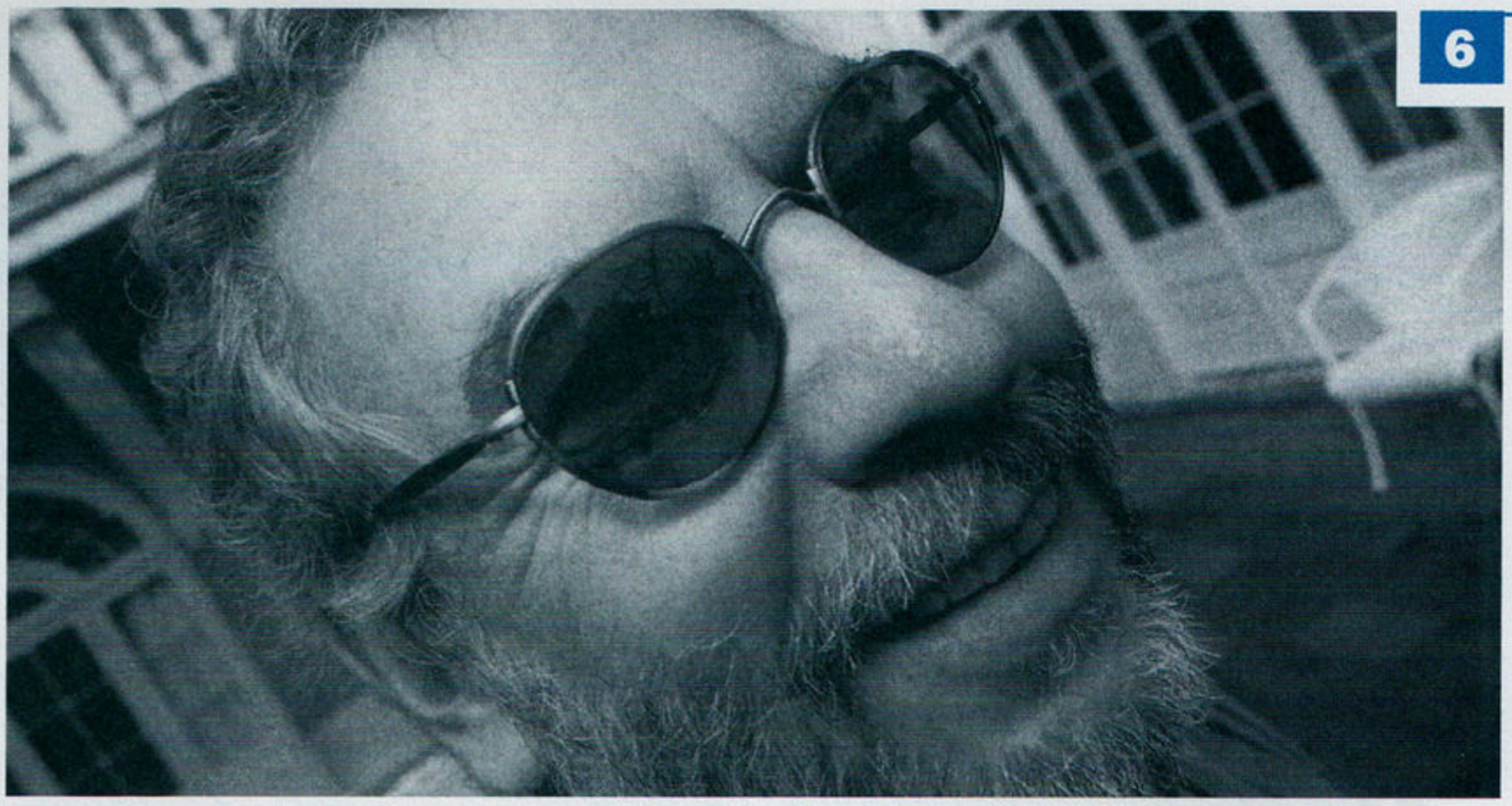
NEXT Generation is affiliated to and shares editorial with **EDGE**, a UK-based magazine from Future Publishing. Gurt lush snogs to the boyz in Baaarth. Love to Miriam and Robin from mushy Doug. CD of the month: Oasis, Definitely Maybe. Fab haircut of the month: Neil. Hello John Cantlie! Jonathan — it's going to be a *great* hole. If in doubt, dance. And welcome on board Deeana



introducing

News

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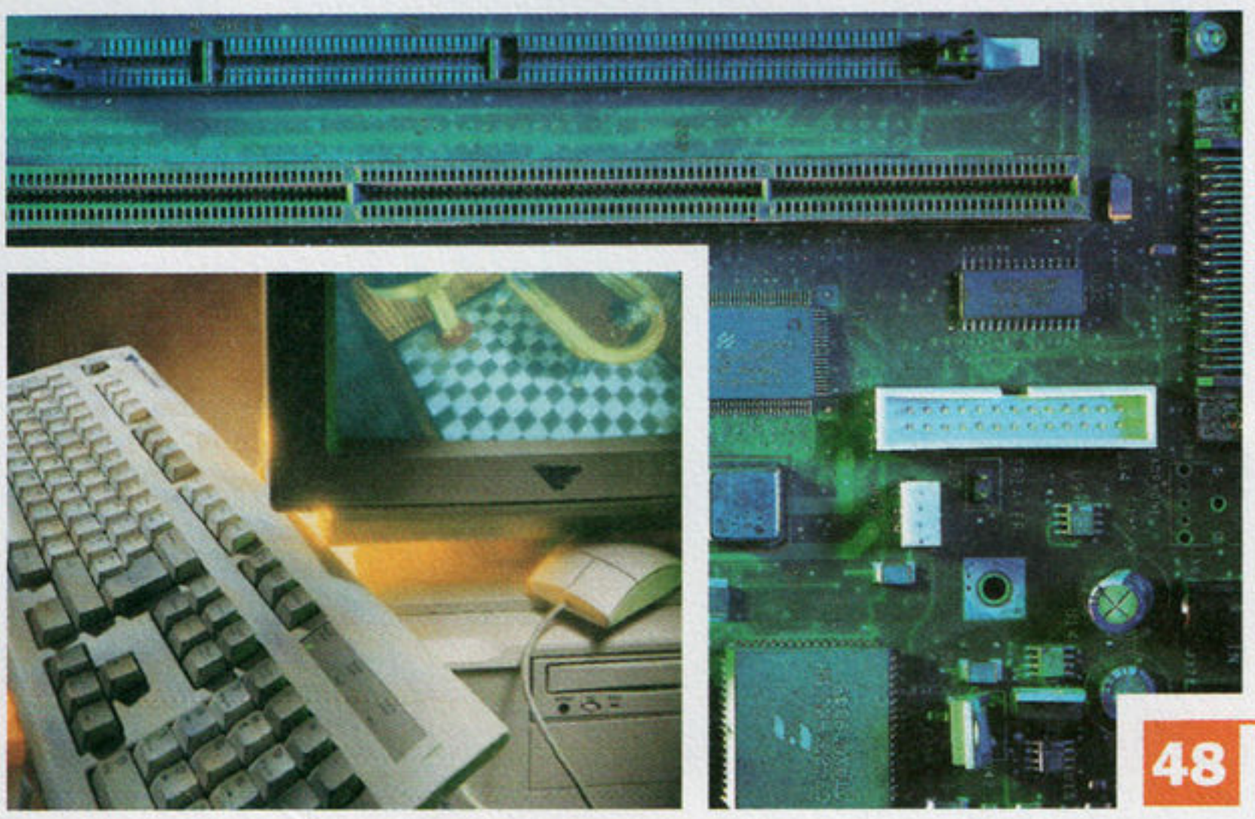

What's wrong with the PC?

Part two. The PC game scene is booming almost despite itself. The incompatibility glitches and user-hostile interface could soon be problems of the past, but can the PC compete with Sony?

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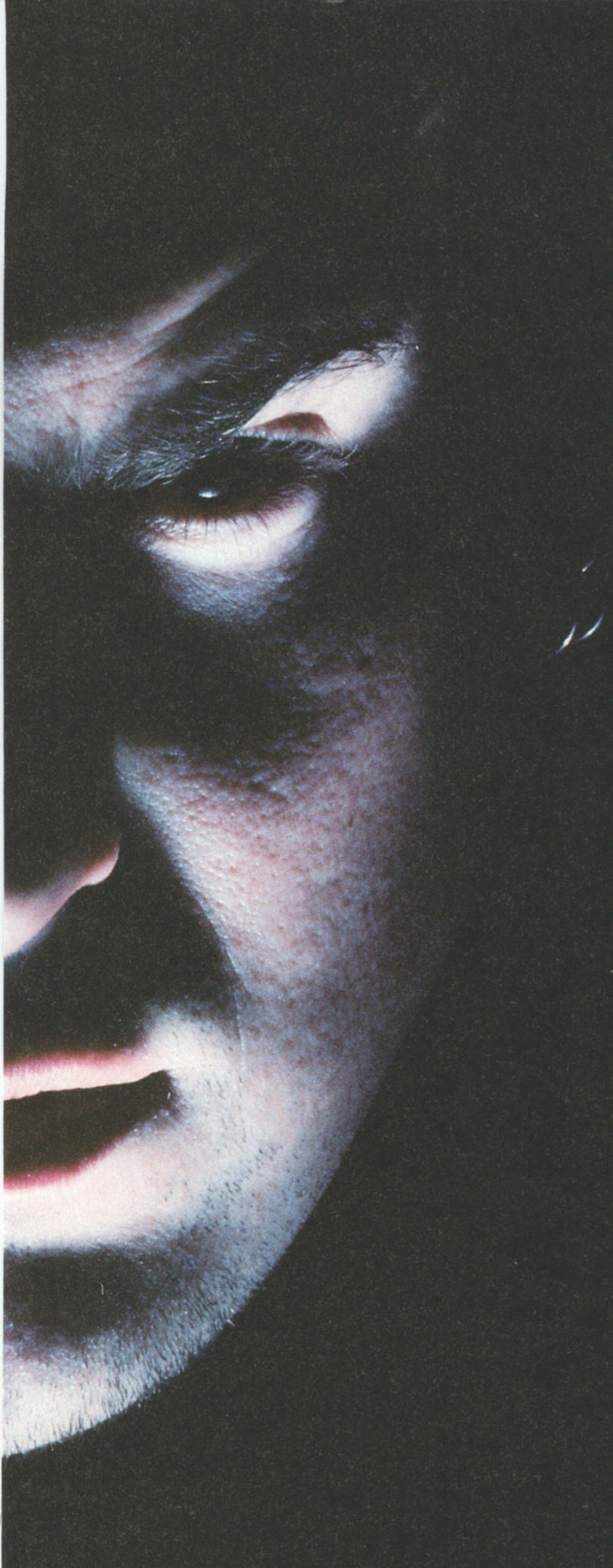

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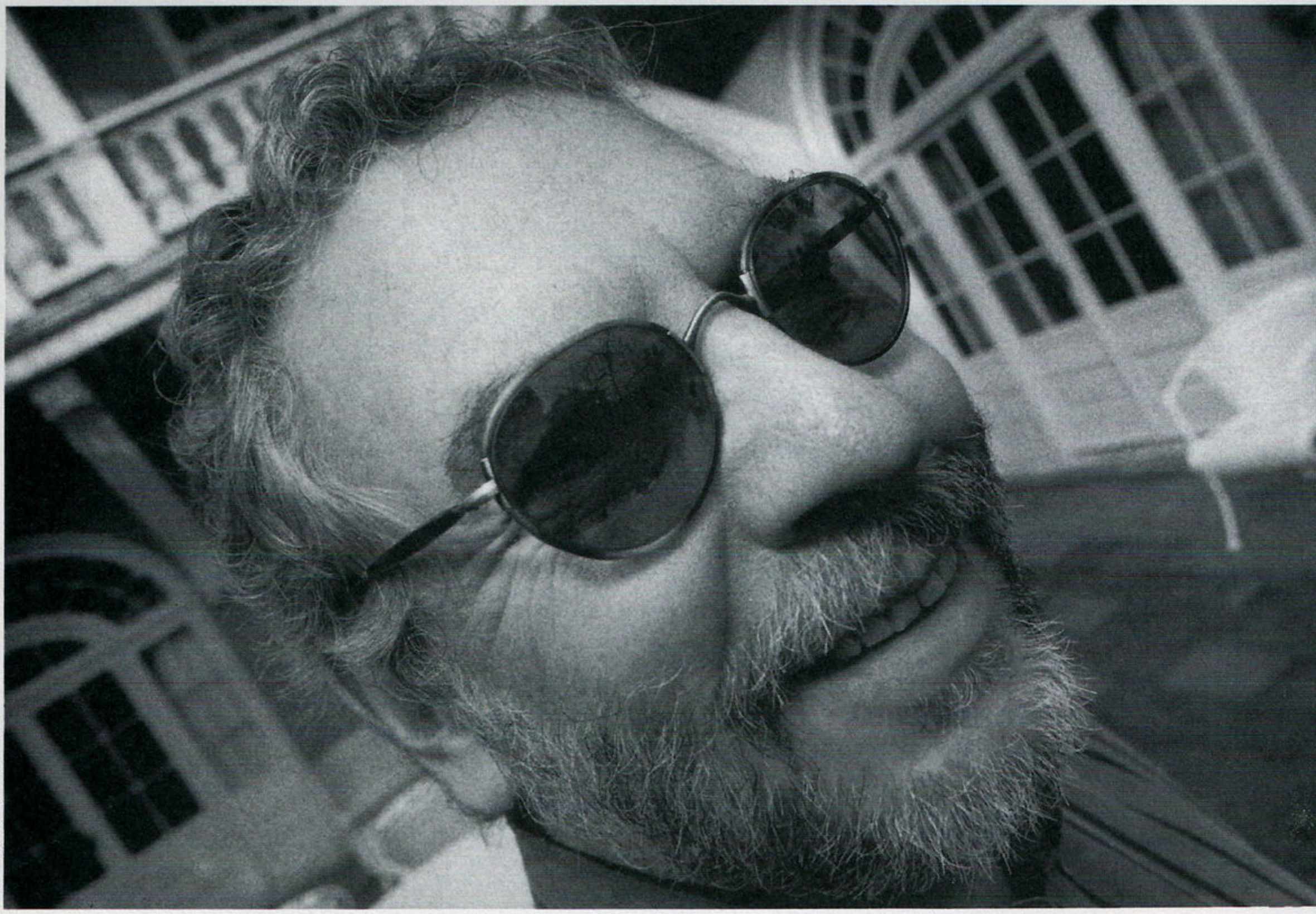
In the beginning, Nolan Bushnell created *Pong*. The rest is videogaming history — and what a history it's been. But has that much really changed since 1972? And what does the unwitting grandfather of *Sonic* and *Mario* make of his billionaire descendants? **NEXT Generation** talks to the man who invented the videogame and asks...



All photography by **Jude Edginton**

What the **hell** has Nolan **Bushnell** **Started?**

Even if — strictly speaking — Nolan Bushnell didn't actually invent videogames, he was the one that let the genie out of the bottle. And to many it would seem that he's been blessed with the three wishes to prove it. First, in 1972 he founded Atari with just $250, then four years later, sold it to Warner Communications for a cool $28 million. Second, videogaming's family appeal formed the base of Bushnell's next creation: Chuck E. Cheese — an empire that in 1981 incorporated 278 restaurants and a personal worth of $100 million. And third, well — Nolan Bushnell is never a man without a plan.

NEXT Generation met with Silicon Valley's

most celebrated gaming entrepreneur to glean his unique perspective on the state of gaming in 1995. What does he think the gaming community has achieved in the last 23 years? And what hurdles still need to be negotiated? And what role will Nolan Bushnell himself play in the proceedings?

Cue to some heavy gaming philosophy, with just a dash of Californian panache...

Pandora's Box?

NG: When introduced as the man who invented videogames, how does that make you feel?

Nolan: Well, you know it's funny, I've always felt that this wasn't necessarily true. Maybe as I get older I get more modest, but we really stood on so many other people's shoulders. The fact is that I played a very large number of computer games when I was in college — often in the middle of the night — in the computer labs.

What I did was popularize it. I was the guy who saw this stuff in the labs and said, "Gee, you know, normal people would like this kind of stuff too." So I'm the metaphorical poet, who interprets the Gods to the masses — in this case it is technology.

NG: So you were the one that let the genie out of the bottle, so to speak. Do you think you've done the world a service?

Nolan: Yes and no. Like anything that has an extreme impact on society, there are benefits and there are problems. There are certain aspects of videogames which are problematic for society and for individuals. Particularly when played to excess — anything done to excess can become a problem. I mean, I can remember when I was growing up people were sometimes disparagingly called bookworms, meaning that they didn't have a life, all they did was read books.

Although, right now that wouldn't be a disparaging term at all...

NG: Have potential health problems always been a part of the gaming experience, even since *Pong*? Or do you think that the problems are a result of games becoming more realistic?

Nolan: I think that even with the very first games there were problems of overuse and a disproportionate allocation of resources.

NG: People spent money they couldn't afford...

Nolan: Right. There were a few *Pong* bums I'm sure who became addicts. I think that people have always enjoyed simulations, and as simulations become more graphic and more real, the fantasy becomes more intense.

There's a growing body of work that shows that violence on TV or in games — whatever — has virtually no effect on the average person, but with certain mental types, who have diminished capacity or have other problems, it can be a trigger point. And so you have to ask if you want to censor something for the mainstream (on which it has no effect) to keep it away from a minority of the people on whom it encourages behavioral problems that may end up being harmful to society. These are not questions for scientists but for politicians.

NG: Do you still play games?

Nolan: Yes, a lot.

NG: What do you play?

Nolan: I find that I like games which have a new look, a new feel, a different world. And I particularly look out for games which have a certain mathematical balance to them — *Tetris* is one that I found to be topologically and mathematically very satisfying.

But at the other end of the scale, I most recently found *Myst* to be highly satisfying.

NG: That's interesting, because *Myst* isn't a typical gamer's game. If anything, *Myst* was a game that attracted newcomers into the gaming world. We thought it was basically a nonevent. It looks good, but there's no real gameplay there. So what do you like about it?

Nolan: Well, I thought that the immersive characteristic of the world made it. I think the puzzles were quite intriguing and very well integrated into the narrative.

The world was compelling and believable. And the puzzles were believable in their mix into the world. And the art and sound was excellent. I felt it was a tour de force.

NG: *Myst* was a *huge* title. Are you surprised that the gaming industry has become so big? Or — we could almost ask — are you surprised it's remained so small?

Nolan: I can say that I had no perception of what big was and what small was at the time I started. My idea of starting a company and having it grow to $3 to 5 million was about as big as my horizon was at that time. If someone had said $8 billion dollars in the US and $5 billion dollars worldwide bringing $13 billion dollars in, I would have said, "Wow." And if you had said that per

"I was the guy who saw this stuff in the labs and said, 'Gee, you know, normal people would like this kind of stuff, too'"

At the height of Nolan Bushnell's success in the early 1980s, he owned two Lear Jets and mansions around the world. A regular traveling companion was George Bush

talking

year, it would be bigger than all of Hollywood's movies combined — by several times — you would have seriously stretched my sense of credibility. So no, I didn't anticipate it at all.

NG: What do you think have been gaming's greatest achievements or improvements during the past 20 years?

Nolan: Games, because of their fast action and realtime nature, have always had to remain faster and better than the standard computer business. If you really look at the very early games we did, there were no actual computers at all, *Pong* and *Tank* were solid state machines — at the time you couldn't get a computer to execute instructions fast enough. You just couldn't do it, the technology wasn't there yet.

It was almost five years after the videogame was introduced that there were any serious microprocessors, and then there were so many hardware assists the fact that there were microprocessors in there was almost insignificant. And so what has really happened is that as the processors started to catch up with the requirements of the game systems to really do the executions necessary, I think the game business really pioneered the methodologies and probably set the computer business forward five years.

NG: You're saying that the game industry dictated the pace of computer technology development, and not vice versa?

Nolan: Right. Because most of the hard technology was developed on the game side and was then ported over into the computer side — and I think a lot of people don't realize that. So that's most likely one of the major things the game industry did.

I think another real tour de force along the way has been the software created to handle simultaneous graphics and sound, that's hard stuff. And that has, in turn, paved the way for some of the conference call and picture compression technologies we have today.

NG: Are there any technologically impressive titles that specifically spring to mind?

Nolan: In terms of trick and neat stuff, I think that *Doom* — that game kernel — was something that could have been done before, but the overall effect (achieved with a relatively truncated and closed environment) really surprised a lot of us.

NG: So that's technological enhancement, but how about the concept of what makes a game great? Do you think gaming itself has evolved?

Nolan: Yes. In 1995 there are many more things that are known about what makes a game tick, and what makes it not work. But the problem is, the human being, when it comes to leisure, is a fickle sort. And no sooner do you think you have them figured out you lose them.

NG: So what still needs to be accomplished right now? What's gaming's biggest challenge?

Nolan: No one has really figured out what the [women] really want. And the women represent a very interesting opportunity for all of us. It turns out that I think I've actually figured out what the women want to do. It came to me not through any great insight of mine, but through observation of my daughter. I have three daughters, two older and one 10, and none of them have really been that interested in games at all. Whereas all my sons are very involved.

One day I came home and my daughter was down in my lab with a bunch of friends, just laughing and chuckling. They turned off the machine as soon as they saw me, but I turned the machine back on and finally I was able to figure out what she had been doing. All of a sudden it was like the light comes on.

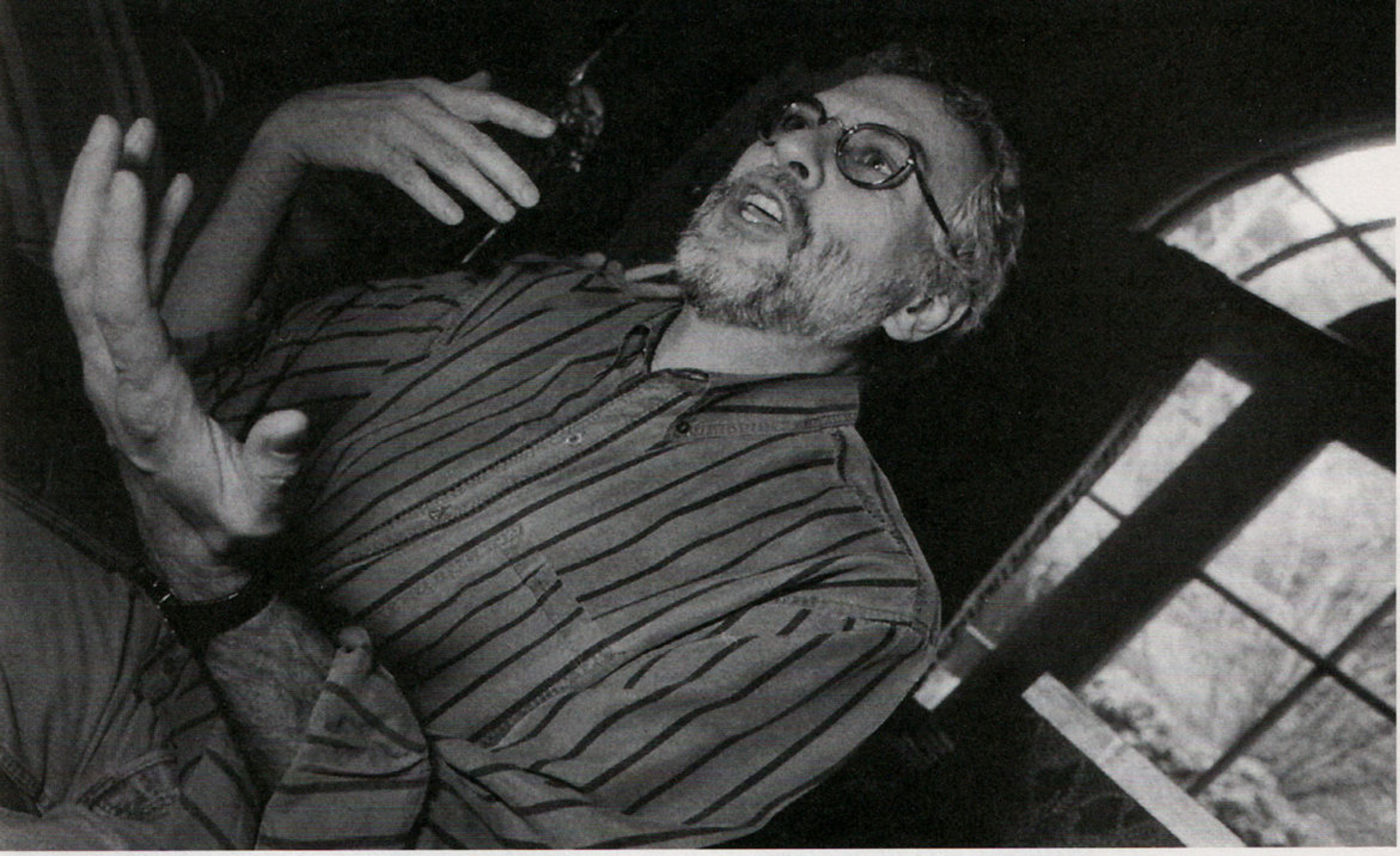
NG: But you're not going to tell us what that is?

Nolan: I know I'm been purposefully vague, but all will be made clear this fall.

The more things change…

NG: You're famous for having attended the early Atari board meetings in Black Sabbath T-shirts and sneakers, most of the staff were hippies and (it's been said) that the smell of marijuana wafted freely through the air conditioning vents. You described the staff of Atari as "people who wanted to make games not bombs." Do you think that a small, idealistic startup — as unique as Atari was in the early 1970s — could thrive today? Or up against the corporate big boys of Sony and

"I'm going to be so bullish as to say I believe that the nonlinked computer will be technically and entertainment-wise obsolete within five years"



Nolan Bushnell is still an active force among the videogame community. His support is often courted by fledgling projects

Nintendo this brand of entrepreneurism is dead?

Nolan: I think entrepreneurism cannot be stopped ever. Governments try to do it through their policies! But at the same time, there is as sure as I'm sitting here, a startup in a garage somewhere that will be significantly more successful than anything that is out there. I have no idea who it is right now, but it's out there.

See, I believe also that there is a major shakeout that will happen during the next 10 years in the game business. And that is the transition from closed to open systems...

NG: A closed system is one such as Sega Genesis, in which permission has to be granted by Sega to produce any game. An open system is one such as the PC, for which anyone can produce whatever they want.

Nolan: And no closed system has survived long term, in history, in virtually any kind of marketplace. There can be cartels in certain situations — the DeBeers' diamond mines, for example — but when it comes to something as interesting and as different as information (and games are nothing more than information) it cannot be controlled, and ultimately the barriers will come down and the systems will open.

NG: This is the opinion of 3DO's Trip Hawkins, also. He wants 3DO to evolve into a standard, open system. So do you think Trip and 3DO are on the right track?

Nolan: Well I liked to tease Trip in that I said, "Gee Trip, I found out with $3 million dollars what has cost you more than $100 million dollars to find out!" And that is that it's very difficult to sell significant numbers of anything at more than $500.

Back in the 1980s, I sold some technology to Commodore and spearheaded its movement for CDTV. Almost four years before 3DO appeared, I had a machine that, for all intensive purposes was equivalent to 3DO. It couldn't do quite so many polygons and things, but for the average consumer, it was good enough. I felt that I could sell a hundred thousand of something that costs $800 standing on my head. I thought that it would be a no-brainer. And I can tell you that the number of units that we sold in the US at $800 you could put in your eye and not draw tears.

NG: Which is why it's such good news that the price of 3DO has dropped. But given that what you just said is true — and Sega's President Tom Kalinske said the same thing last month — it's amazing that the PC game scene has exploded recently. And many people are buying $2,500 PCs purely to play games. Why are so many people willing to spend so much money?

Nolan: I think maybe what we're seeing is the first javelin over the walls of the world devolving into an open system. Also, it's impossible to divorce the business potential or the perceived business potential around the PC.

NG: So people are buying these machines, kidding themselves that the expense is worth it because they might use the technology for business — and not just games.

Nolan: Nobody buys a computer, everybody buys software. The computer just happens to be a harassment that is necessary to play the software.

NG: Well, the next generation of game platforms — PlayStation, Saturn and Ultra 64 — are all closed systems. So is this a mistake being made by 1995's gaming moguls?

Nolan: I can't really say that keeping a closed system in the short run is wrong. It's a way to create tremendous cash flows and tremendous profitibilities. You can build a very good coffer. If I were them, though, I would be very, very concerned as to how I would make the transition to an open system. And that is gonna be a very dicey one for them because big corporations don't eat their babies very well. And what I really mean

"I like to tease Trip in that I say, 'Gee Trip, I found out with $3 million dollars what has cost you more than a $100 million dollars to find out!'"

talking

"women and girls want to play videogames, but there's something intimidating about the current experience that doesn't facilitate them. There's a big opportunity there"

by that is, that essentially you cannot do things which are important to your future without hurting your current business.

New kids on the block

NG: When you look at Atari, what do you see?

Nolan: Talking about the current Atari of the last few years, I see a very powerful set of technologies that have been developed to do some good things. Unfortunately, what has happened is that Atari started a little bit too late to become a mainstream competitor. And it had a tremendous disadvantage because it didn't have the Japanese marketplace as feeder stock for game software. That put the company at a disadvantage.

It's not over for Atari, but it's going to take more than just good technology to do it. The company will have to do some interesting marketing. It will have to get to a couple million set-top boxes before they have the basic infrastructure to be able to carry on.

NG: Do you think that the arrival of Sony (the first major outside megacompany to enter the videogame arena) is a good thing? Does it signify the fact that gaming has finally come of age and is now part of the mainstream?

Nolan: It could be good for consumers if Sony did it the right way. But I see no sign that Sony is trying to do it the right way. There are so many things that need to be done with games that are interesting and fun and that people would want to do; things that have very little to do with slapping a cartridge in a slot and playing with the joystick. That is clearly the market as it exists now, but Sony, unfortunately, is doing very little to create the market of tomorrow.

NG: It's ironic that Philips (the straight-down-the-line electronics company) comes in and makes a multimedia machine (CD-i) whereas Sony — the world's biggest multimedia company — comes in and make a pure and simple game machine…

Nolan: It's really a bizarre thing that Sony has innovated so narrowly in the existing field. Sony basically entered the polygon war, and that's about it. The company's got some pretty good software titles, but I always look at businesses that are really pushing forward, in terms of innovation.

The next generation

NG: Networking — the idea of linking people through their computers — has got to be the next big thing in videogames, right?

Nolan: Communication, when added to the witch's brew of high MIPS [Millions of Instructions Per Second — a measure of computing power] in the living room, leads to a whole new set of things, which I think will become dominant.

I'm going to be so bullish as to say that I believe that the nonlinked computer will be technically and entertainment-wise obsolete within five years. My goal is to be able to have the cyberspace 'sportstainment' of San Francisco play against the cyberspace 'sportstainment' of Boston Friday night after the Super Bowl: 10,000 people against 10,000 people. And to have it televised, and to have interviews with some of the leading contenders. I think when you get that many people involved in anything, just by extrapolation of your parents and girlfriends and boyfriends, that we could probably create a viewership of 10 to 20 million people without even trying.

NG: It's a fantastic concept, I guess the problem is giving each of those players a meaningful role.

Nolan: Right. And you do that through what I call the bubbling pot method of participation. It's kind of a dynamic double elimination. It will all be clear very shortly.

NG: So your vision of the future of gaming is a huge multiplayer environment. But a lot of other people think the Holy Grail of gaming development right now is the interactive movie — the idea of having a computer generated movie environment, in which you play the lead, and you decide what happens. Do you have an opinion concerning the interactive movie?

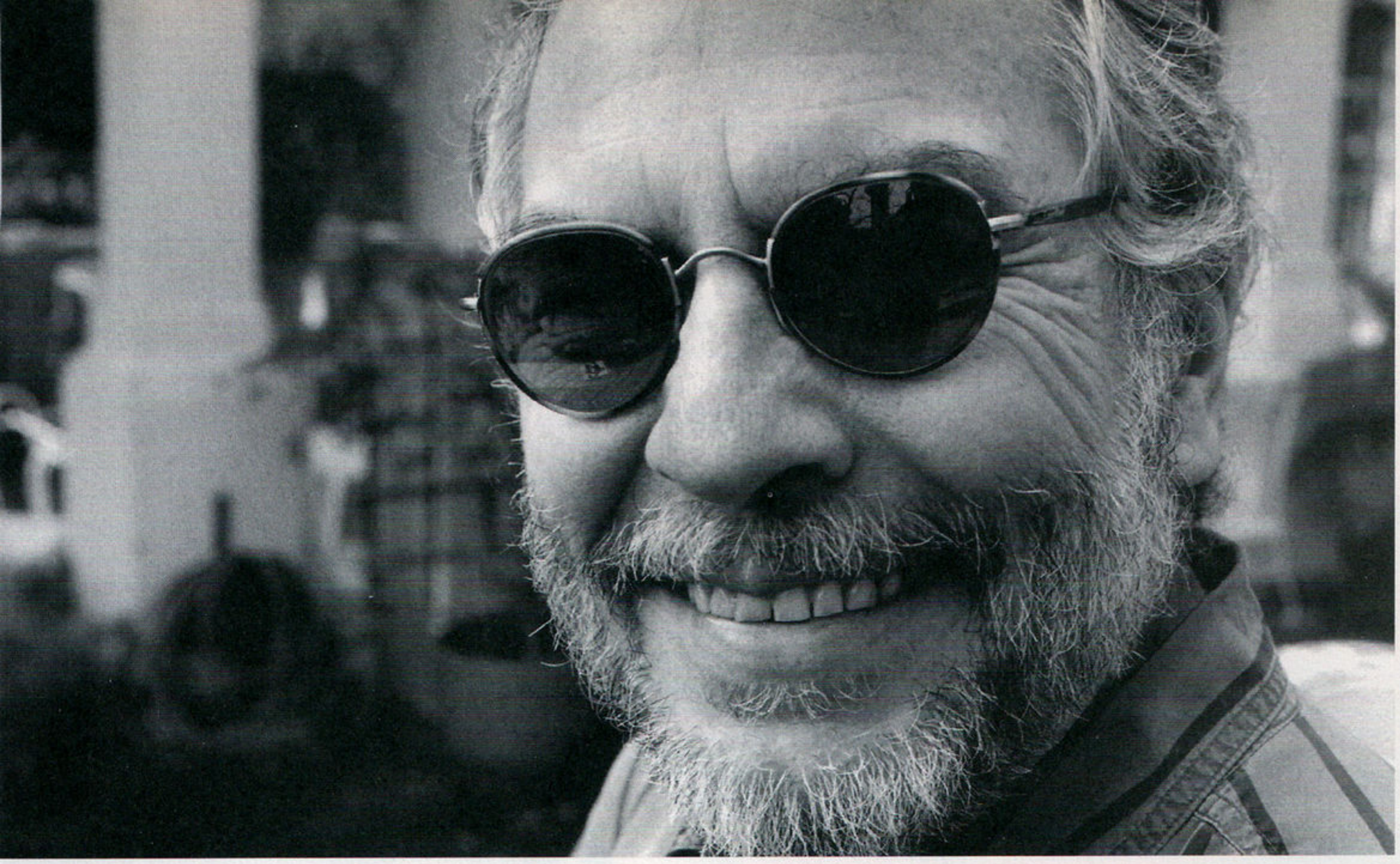
Nolan: I believe there are some interesting disconnects. If you take a traditional movie, the objective is immersion. You want to get the person so involved in the reality of the characters, of the situation, of the dynamic, that you lose the self, totally, and become an observer; it becomes a fantasy roleplay. But the minute you ask the person to respond, you force them back into their self. And that's a disadvantage to the whole interactive movie concept, it seems to me.

NG: So is the 'interactive movie' concept fundamentally flawed in your opinion?

Nolan: Not necessarily. I have a chart downstairs that I used for a speech, half humorously, in which I plotted button clicks per hour as a measure of interactivity.

The highest activity is 10 per second, or a

Who says you can't teach old dogs new tricks? Here Bushnell explains the rudiments of *Pong* to a canine audience. Tricky? Try explaining *Sonic The Hedgehog* or *Mario Bros.*



An evangelist for all new applications of technology, Bushnell crusaded for multimedia in the late 1980s, long before 3DO

couple hundred a minute (that's a high-paced videogame) and at the other end of the scale is once every hour and a half (that's the play button on the VCR). We have well defined the once-every-hour-and-a-half group as a market and we have well defined from 10-a-second-up to a couple hundred-a-minute. But in the middle area, the netherworld, if you will, between 10-a-minute and one-in-an-hour-and-a-half, is very unexplored territory, and the world is littered with the decaying bones of attempts in that area. I cannot think of a single success, not one. Now, I don't believe that the world is that disconnected, I feel the world is a continuum. Very seldom to you see statistical distribution like that. So I believe there's something there, too. I just don't believe we've come close to discovering what it is yet.

NG: Do you think that games are now more fun to play than *Pong* was?

Nolan: Yes and no. In some ways, we — because of technical limitations — had to focus exclusively on the essence of game, not production values. And so we spent tremendous amounts of time trying to do things like calibrating how much a quarter turn of the control dial resulted in how much movement on the screen. Why does that matter? Well, it turns out it matters quite a bit because certain people have very good muscle skills and some people don't. And you wanted to sorta match that. And you didn't want to have them turn too far, because if you did then there would be wrist problems. There are so many tiny issues in a game that literally you could change 10% and double the revenue of the coin-op.

NG: And the arcades of today are lacking some of this craftsmanship?

Nolan: Well, the coin-op side also had a very interesting capability that seems to have been lost, in that it was the way games were presented to the public first. And then the game migrated to the consumer side. Right now the coin-op games have been relegated to a driving game and a ninja punch-kicking game. You don't find anything else out there. Plus the arcades are increasingly becoming a side-line — fewer and fewer people go to arcades. There are people who do go spend increasing amounts of money, but it seems like it's filtering itself to oblivion. And I think the coin-op business needs a huge reset, because so many of the games are just not fun to a majority of the people. And so the typical person happens to wander into an arcade to see what's happened in the last 10 years, looks around, shakes his head and says "there's really nothing in here for me." I think that's bad, I think it's a real problem.

NG: Whereas *Pong* was basically for everybody?

Nolan: *Pong* had an interesting characteristic. Since it was two players for a quarter, and there wasn't a one-player version, it was in fact a social lubricant in many instances. It was very common to have a girl with a quarter in hand pull a guy off a bar stool and say, "I'd like to play *Pong* and there's nobody to play." It was a way you could play games, you were sitting shoulder to shoulder, you could talk, you could laugh, you could challenge each other — that sort of thing.

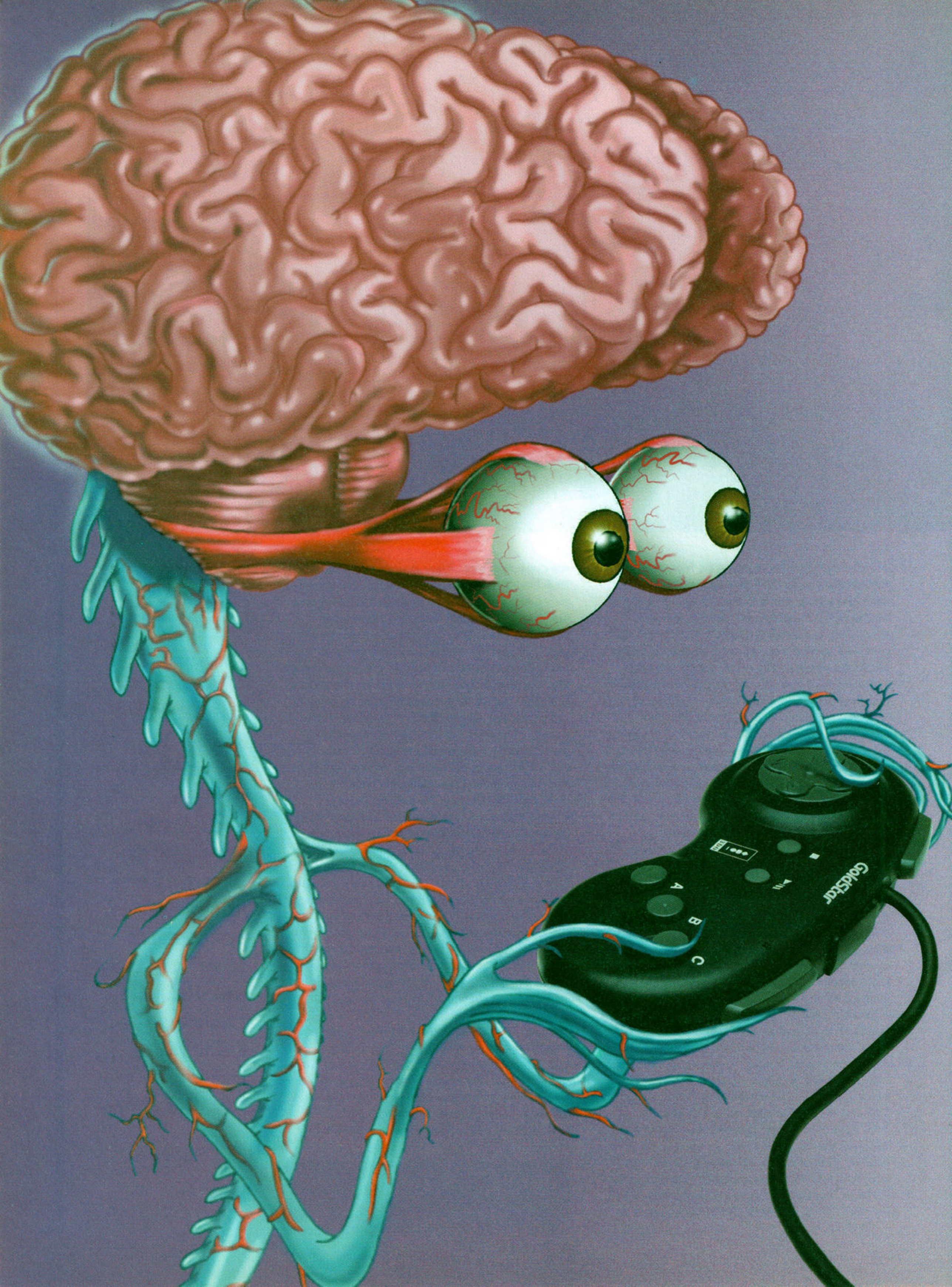
NG: You also had one hand free to hold your beer or whatever.

Nolan: As you became better friends, you could put down your beer and hug. You could put your arm around the person. You could play left-handed if you so desired. In fact, there are a lot of people who have come up to me over the years and said, "I met my wife playing *Pong*," and that's kind of a nice thing to have achieved. ng

NEXT MONTH

Sony's US President — the man behind the launch of the PlayStation — talks exclusively with **NEXT Generation**

"As sure as I'm sitting here, there is a startup in a garage somewhere that will be significantly more successful than anything out there. I have no idea whom it is right now, but it's out there"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Atari gears up for battle

As PlayStation and Saturn prepare for US launch, Atari pumps up Jaguar for the final conflict

Atari is all too aware that 1995 must be Jaguar's year. Its head start in the next generation race will soon be over, however. Come this fall, Atari will be competing toe-to-toe with Saturn, PlayStation and — if you believe Nintendo's production schedules — Ultra 64. And there just ain't no way Jaguar can compete, at least in terms of its system power. Just forget the '64bit' and '32bit' tags, in these days of custom chips, those are yardsticks of performance useful only to advertising men. Simply look at the games. Compare the computing power on display in Jaguar's portfolio to Saturn's *Virtua Fighter* or PlayStation's *Ridge Racer*. Now do the math.

But it's not all over yet. Jaguar still has a clear six months with only the troubled 32X and expensive 3DO as competition. And it intends to make the most of it. To help with the push toward selling enough Jaguars to reach 'critical mass' and to ensure continued third-party development, a series of add-ons for the machine will be released during the next six months.

The Jaguar 2, which has received much press recently, is actually the codename for the double-speed CD-ROM Drive add-on, which is due for release later this month, or "whenever the games are finished, whichever is sooner," explains Atari's Ron Beltramo, director of marketing. "The CD drive's been ready for months, but there's no point releasing if there's nothing to play on it." Newly expected titles include *Battlemorph*, *Blue Lightning*, *Highlander*, *Demolition Man* and *Creature Shock*.

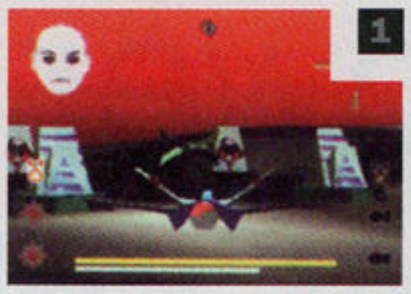
Also of interest is the all-in-one Jaguar/CD unit, which is rumored for release this fall, 1995, around the $350 price point. Featuring the Jaguar hardware (slightly tweaked to run faster and cope with direct CD access) plus the CD unit, this will be Atari's slightly cheaper answer to the PlayStation and the Saturn.

At about the same time, the company will release a series of connectability products. The US (land of the brave and the only free local telephone calls while the rest of the world has to pay) gets a $150 Jaguar

Jaguar's CD-ROM Drive may look like a toilet (complete with flip-top lid), but it could well give Jaguar gaming the boost it needs

Down in Virginia...

Governor George Allen has ordered that games be deleted from every state-owned computer. A 1993 survey of 1,000 US corporations revealed that employees spend an average of 5.1 hours a week playing games instead of working. That (supposedly) translates into $10 billion a year in lost productivity, and that's something that ol' Governor Allen just can't stomach.



Atari's Jaguar CD-ROM line-up includes: 1 *BattleMorph* (sequel to *CyberMorph*); 2 The inevitable *Dragon's Lair*; 3 TV tie-in *Highlander*; 4 More 3D action in *Robinson's Requiem* 5 F-18 action in *Blue Lightning*

What is it?

Launched in the early '80s, this product represented Nolan Bushnell's return to the home electronic entertainment market. Aiming it at a young audience, Bushnell expected it to take the toy world by storm

Atari's sexy black game CDs will look almost as as sleek as PlayStation's. So far there's been no news of price

Voice/Data Communication (JVDC) modem, developed in conjunction with Phylon Communications. Complete with a stereo headset, the JVDC will enable players to talk to each other while competing, and also allow pauses to answer incoming calls.

Europe, and the rest of the world, will instead receive the Jag Link (also available in the US for $29.99), a serial lead enabling Jaguar consoles to connect directly for two-player games. In addition, an add-on called the Catbox is scheduled for late summer. This will operate as a junction box between Jaguars, enabling the kind of multiplayer gaming previously found only on networks. And thanks to a recent deal with Irvine, CA-based Virtuality Entertainment, Atari will release a VR headset around the winter holiday '95 in the US at a projected $200. Developers are already working on conversions of (as yet unnamed) arcade games for the unit.

Is it enough? It's too early to tell. Domark's Colin Boswell holds the opinion which is seemingly typical of the nonpartisan development community. "Basically, they've got six months to really establish Jaguar as a viable product — not only in the consumers eyes, but in the development community as well," explained Boswell. "After that point, some big fish will swim into their pond. Atari's big problem is that, OK, it was the first console manufacturer, but it hasn't had a really big success since the 2600. This means that they not only have to sell the idea of Jaguar to everyone, but also convince the world that Atari is a company that can see it through."

Virgin Interactive Entertainment's Director of Product Acquisition, Julian Rignall, agrees that Jaguar has to make the most of what time it has left. "Gamers are looking to upgrade and they presently have only [the Jaguar] and 3DO to choose between," Rignall said. "Atari's lethargic performance comes purely down to the fact that there have been no killer games for it. *Tempest 2000* was great, but unless Atari comes up with two or three great games in the next six months, Jaguar will be absolutely steam-rolled by the new Sony, Sega, and 3DO machines."

If only there were as many decent games as there are items of Jaguar merchandise, Atari would be laughing

Atari is working on it, you can bet on that. More news can be expected at the E3 show in May. ng

"Atari has six months to establish Jaguar as a viable product. After that, some big fish will swim into its pond"

breaking

Low-cost 3D power from VideoLogic

***RenderWare*, *BRender*, and *Reality Lab* have a new competitor**

it is...

The Petster. Designed as a robotic pet, this sonically-responsive gadget ran on wheels and responded to hand claps and other commands. This was not one of Bushnell's most successful works

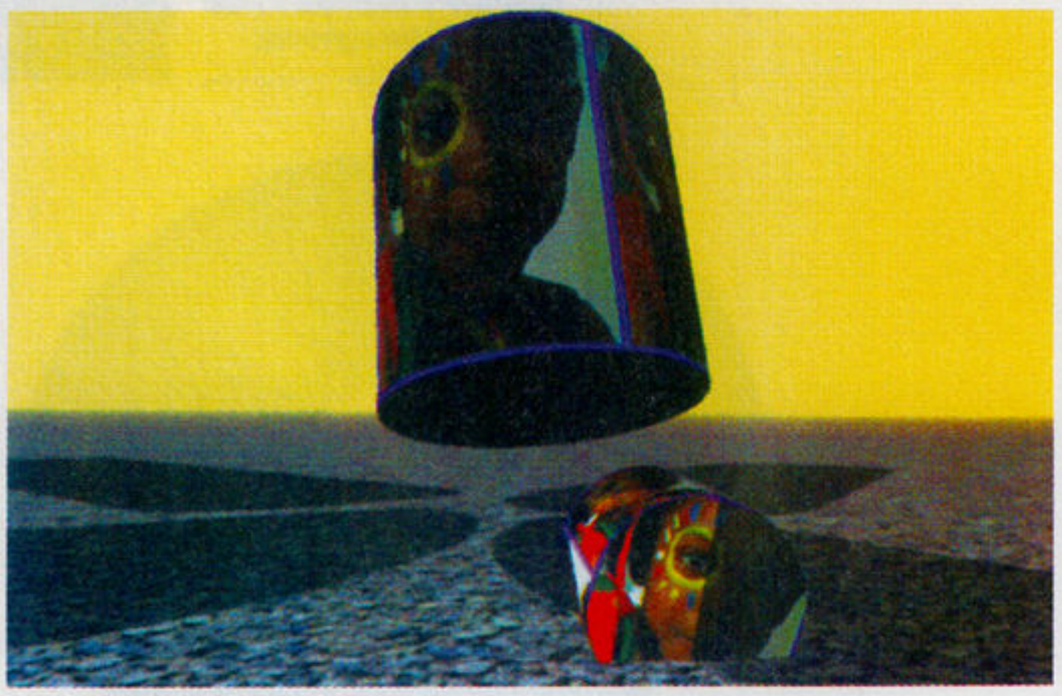
England is rapidly becoming the center of excellence for 3D rendering systems aimed at the videogame industry. The latest addition to the field is VideoLogic's innovative PowerVR technology.

PowerVR is designed to provide fast rendering with a wide variety of 3D effects such as Gouraud shading, true-color modes, rotation, and scaling. Although these abilities are shared by other prominent 3D systems like *RenderWare*, *BRender*, and *Reality Lab*, *PowerVR* takes a noticeably different approach by using dedicated custom hardware and a new object-oriented API (application programming interface) to boost rendering speed and texture-mapping abilities. VideoLogic claims that the system provides arcade performance for the price of a console.

At the heart of *PowerVR* is the Image Synthesis Processor (ISP), which creates the required scene in memory before displaying the results. *PowerVR*'s other custom chip, the Texture Shading Processor (TSP), supplements the ISP by providing all the hardware texture mapping plus various special effects.

Like many advanced programming languages, such as C++, *PowerVR*'s API is object-orientated. Once each object is defined, there's no need to redefine it for every situation in which it appears. Hierarchical linking of objects is also an important aspect of the *PowerVR* API. This allows quicker and more precise code to be written, thereby reducing development times for games.

"It's a generation ahead of all the technology used in the latest Japanese consoles," claims Neil Davison, VideoLogic's European marketing manager. "Most other approaches to fast 3D still involve the construction of wireframe models, which are then filled, texture mapped, and hidden surfaces are removed. *PowerVR* does not use this method."



Complex textures and effects can be added to every object in *PowerVR* by means of the custom Texture Shading Processor (TSP)

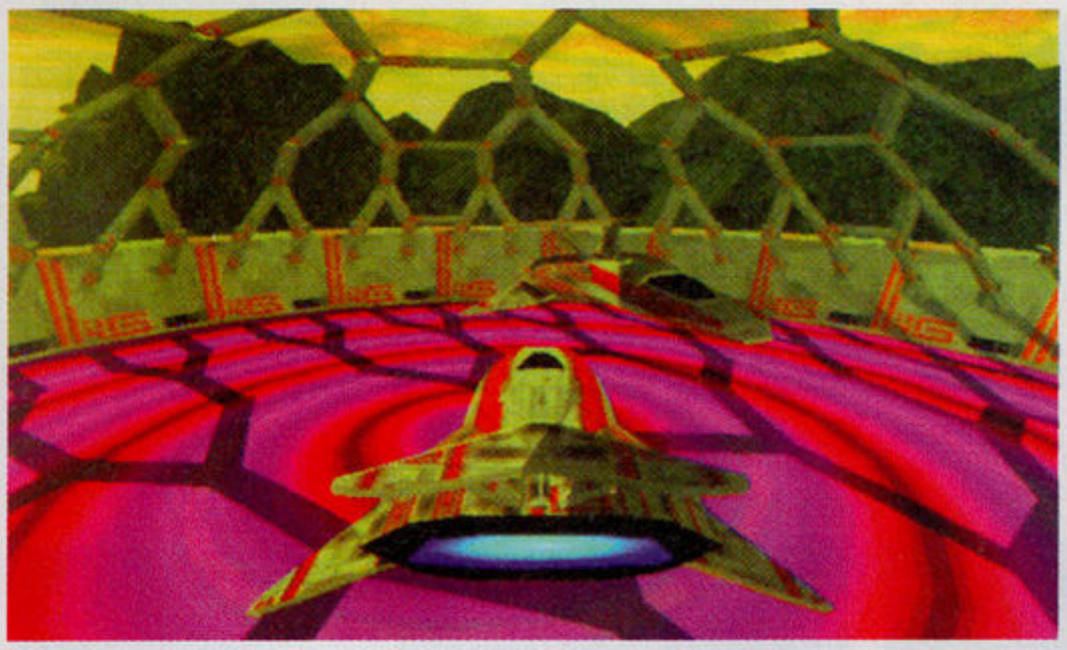
According to VideoLogic, *PowerVR* will allow the creation of games with unlimited colors

Instead it employs a new technique which VideoLogic refuses to elaborate on because a patent is currently being applied for. At its heart is a procedure for dealing with the 3D clipping of polygon faces (z-buffering).

VideoLogic claims that *PowerVR* provides arcade performance for the price of a console

"We wanted to eliminate as much memory [occupied by *PowerVR*] as possible," explains Davison. "Z-buffering is memory heavy and processor intensive. Our entirely new approach means that no z-buffering is required at all. This is the key to the huge cost reduction that we've pulled off here," Davison adds.

There are other advantages, too. Because each object is defined and no processor time is required for z-buffering, more power can be directed toward the special effects. Transparent operations are particularly enhanced, making it much easier to



Shadows are automatically calculated by the API (top). Fast clipping of objects like these cliffs is *PowerVR*'s forte (above)

PowerVR gets NEC deal

VideoLogic has established a joint venture with NEC aimed at turning *PowerVR* into a massmarket product within a year. The technology has been licensed to the Japanese company, which is responsible for manufacturing and marketing the system. The deal could be lucrative for both parties. NEC's links with major Japanese firms place it in an enviable position to obtain high-paying customers in the console market. There are already rumors that Sega is involved in negotiations.

produce images like cars and buildings visible through flames.

Also, as there is no distinction between moving objects and background scenery, more colors can be manipulated simultaneously and realistic shadows are automatically added for every polygon with no reduction in speed. Says Davison: "Obviously we still have to render each frame but the process is greatly speeded up this way."

And *PowerVR* is scalable — if you double the number of chips, you increase processing power two-fold. Ultimately, the aim is to implement *PowerVR* with only one chip, thereby making it even cheaper to incorporate in consoles and add-on boards. A full system would include a processor, memory, a storage medium, and the *PowerVR* chips. VideoLogic claims that this will cost no more than $495.

The promise of arcade-perfect conversions of games for home machines is too enticing a prospect for major companies to ignore. By offering custom hardware and software to tackle the task, VideoLogic could be in a strong position when *PowerVR*-based systems arrive next year. ng

Advertainment

In the first of a new series on the art of videogame marketing, NEXT Generation views Sega's Japanese TV commercial for the Saturn

Company: **Sega**
Product: **Saturn**
Date: **Dec. 1994**
Origin: **Japan**

1 The action begins in a factory on the planet Saturn. 2 A group of coneheads enthusiastically discuss the production of Sega's new console. 3 A printing press stamps the Saturn logo onto the machines. 4 The coneheads retire to a cloakroom. 5 They disguise their cranial bulbousness with masks. 6 They then enter their spaceships. 7 A conehead disguised as a stereotypical businessman delivers a pile of Saturns by bicycle. 8 But it was all a dream. Back in reality, the businessman goes home with his Saturn. 9 The logo reads: "Saturn from Saturn".

Saturn and Playstation: the battle begins

With Sega and Sony now entering the next gen game arena, NEXT Generation weighs up the pros and cons of their machines

Welcome to the next level. Sega and Sony join 3DO and Jaguar in the race for domination of the 32bit game market. Both have the power to make it big, but which one will win the hearts, minds, and wallets of the gaming public?

The next generation is now well and truly under way: Sega's Saturn and Sony's PlayStation have arrived. **NEXT Generation** takes the opportunity to compare and contrast the relative strengths and weaknesses of both machines.

As far as hardware aesthetics go, popular opinion is split: the chunky gray Saturn (the glorious silver casing of the pre-pro model was, sadly, canned) has pleasing lines and a weighty feeling of power, but is something of a juggernaut compared to the slimline PlayStation. Sony's baby takes up exactly 70% of the volume of the Saturn and has a substantially smaller footprint.

The Saturn's design, although stocky, is elegant, while Sony chose to go for graceful simplicity in its design, with only rows of serrated vents cluttering the sides of its machine.

Both casings are molded from ABS (Acrylonitrile Butadiene Styrene) plastic, which is suitably robust. Sony's build quality isn't usually in question; however, this does mark something of a turning point for Sega after the flimsy and suspiciously

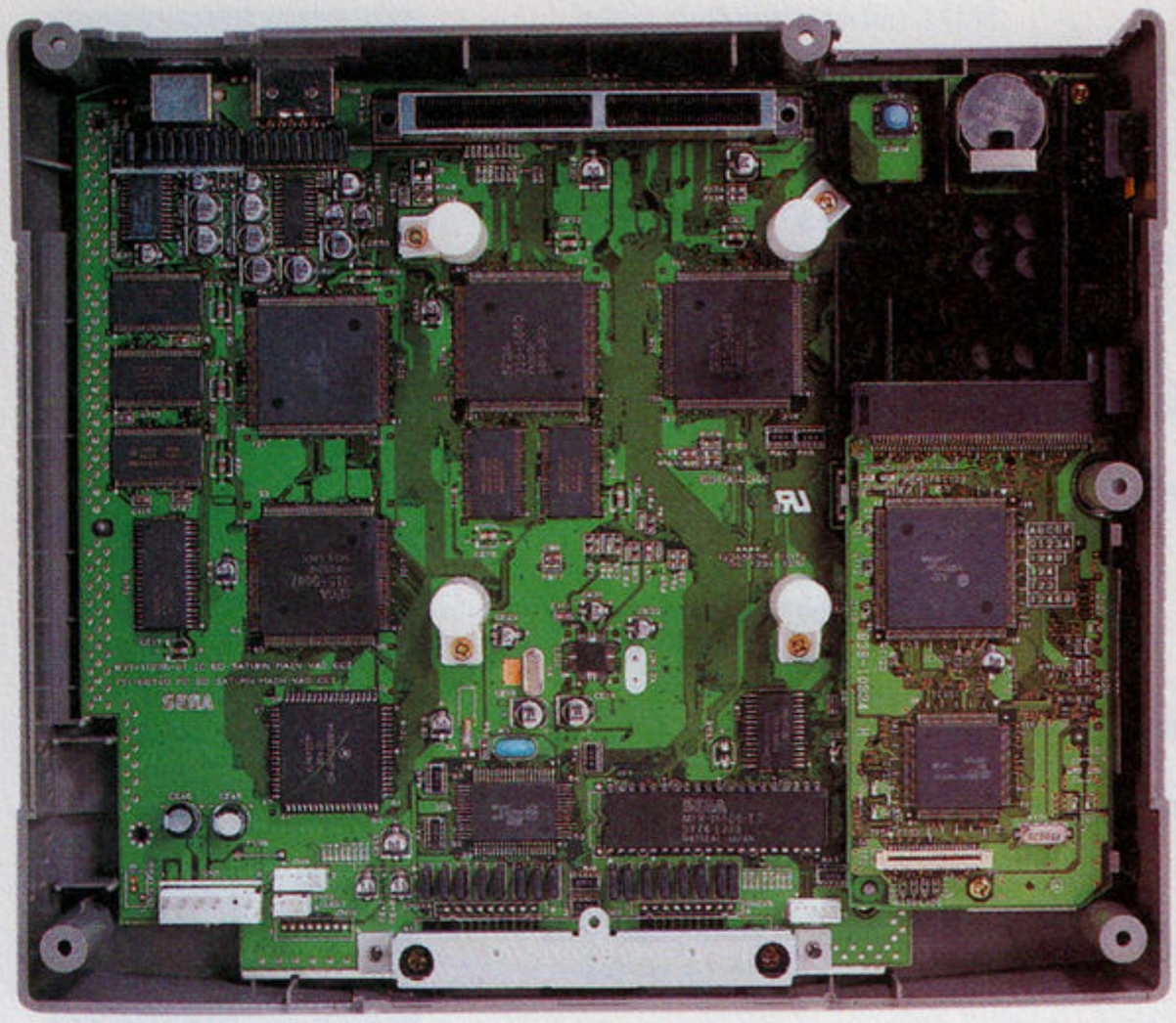
The chunky, gray Saturn has pleasing lines and a weighty feeling of power, but is something of a juggernaut compared to the slimline PlayStation

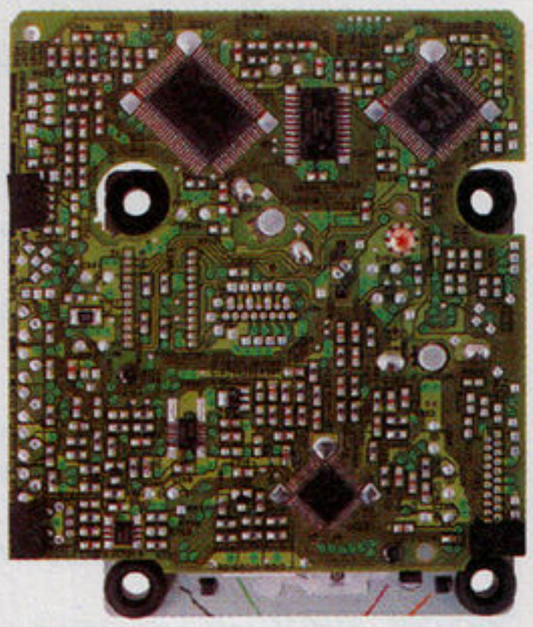
lightweight Genesis and Sega CD (although the Saturn still feels disturbingly hollow). Joypads are a similar story. Sony's device, contrary to popular belief, is the superior of the two in all regards: it features build quality, ergonomics, and a general 'feel.' But, to Sega's credit, its cord is almost twice as long as Sony's.

The rear ends of both machines reveal a similar picture: While the Saturn has just two Sega-standard ports — one enigmatically labeled Communication Connector — plus a 10-pin A/V socket, the PlayStation boasts the following ports: a dedicated I/O socket, R and L audio phono jacks,

Namco's *Ridge Racer* (left) was the first to show its credentials. *Daytona* on the Saturn (right) already has something to live up to

breaking





The Saturn's interior (left) suffers from Sega's off-the-shelf chip policy. Three separate circuit boards and dozens of chips are needed to make it all work. The sound is generated by a group of chips which lie underneath the CD drive mechanism (above)

Where is it?

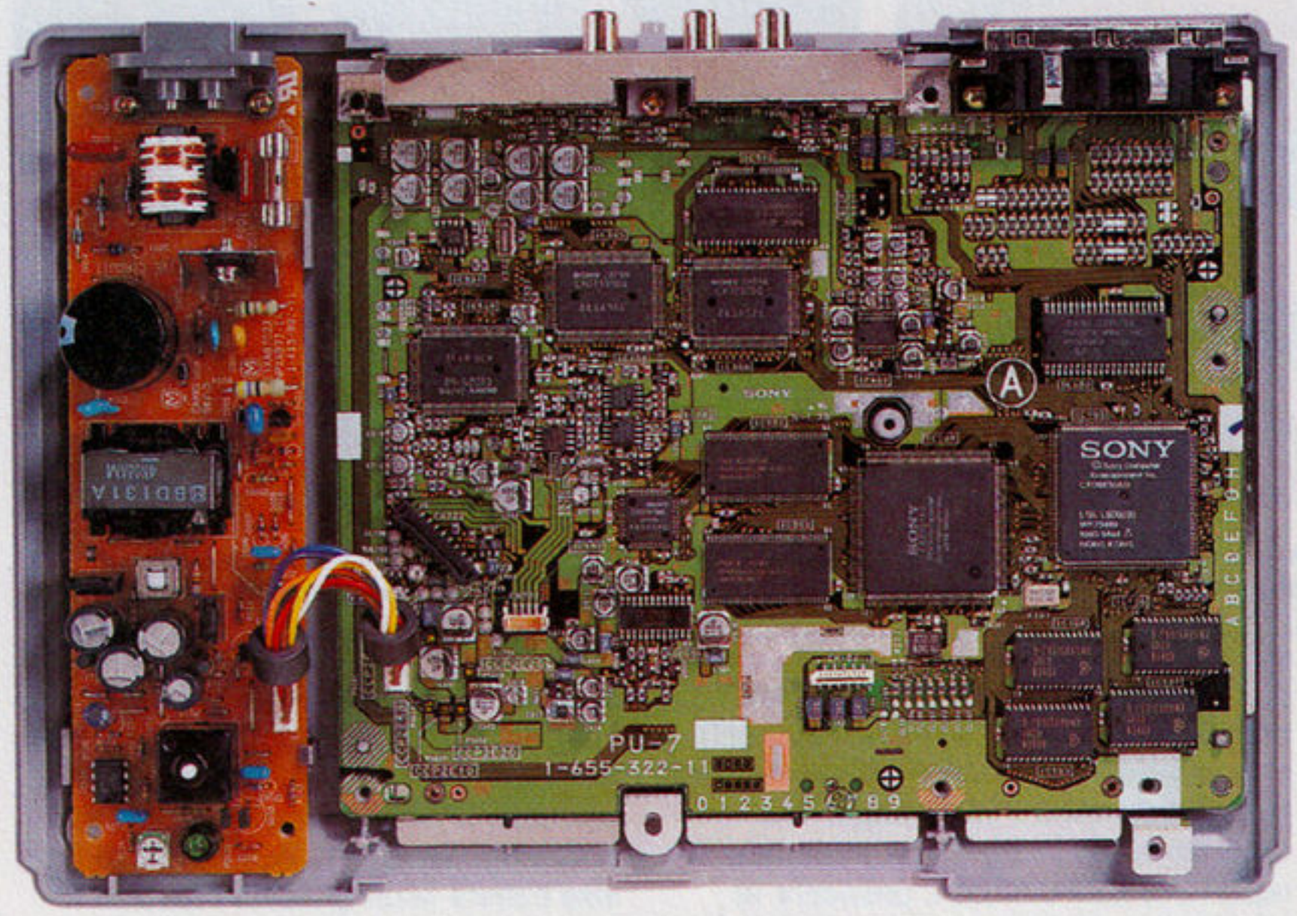
It was the test site for the world's first commercial arcade machine, *Pong*. The coin-op was Nolan Bushnell's second attempt, after *Computer Space*, at producing a dedicated videogame machine

Statistics

DIMENSIONS
PlayStation: height 58mm x depth 184mm x width 266mm = 2838cm³.
Saturn: height 85mm x depth 259mm x width 227mm = 4007cm³.

PRICES
PlayStation: Japan RRP ¥39,800 ($434); Import $850 (average, including *Ridge Racer*).
Saturn: Japan RRP ¥44,800 ($280); Import $900 (average, including *Virtua Fighter*).

After the initial silly season, when machines were fetching around a grand on import, prices have now settled down. The Saturn had a brisk start but interest has now generally waned in favor of the PlayStation.



The PlayStation's unbelievably neat circuit board belies the machine's power. Sony's integrated silicon has enabled it to produce a very space-efficient design

a composite video-phono jack, an S-VHS DIN socket and a Sony-specific A/V port. Certainly, as far as connectability goes, the PlayStation is the friendlier machine.

Both systems carry the promise of expandability with removable covers hiding expansion ports (but then, so did a dozen consoles before them). This same port on the Saturn also gives access to the battery holder: a battery is included with the machine, giving it built-in system memory, with a clock and calendar. However, Sony opted for the slightly more elegant battery-backed memory cards which fit into the case above the joypad ports. Round two to Sony.

The previously undiscovered interiors of the machines reveal a telling scene. Sony's hardware is a masterpiece, with one board carrying heavy components, one large circuit board, and the CD drive sitting on top of a thin metal shield.

The Saturn, however, is a mess: again, bulky components take up one circuit board, but there's another trio

breaking

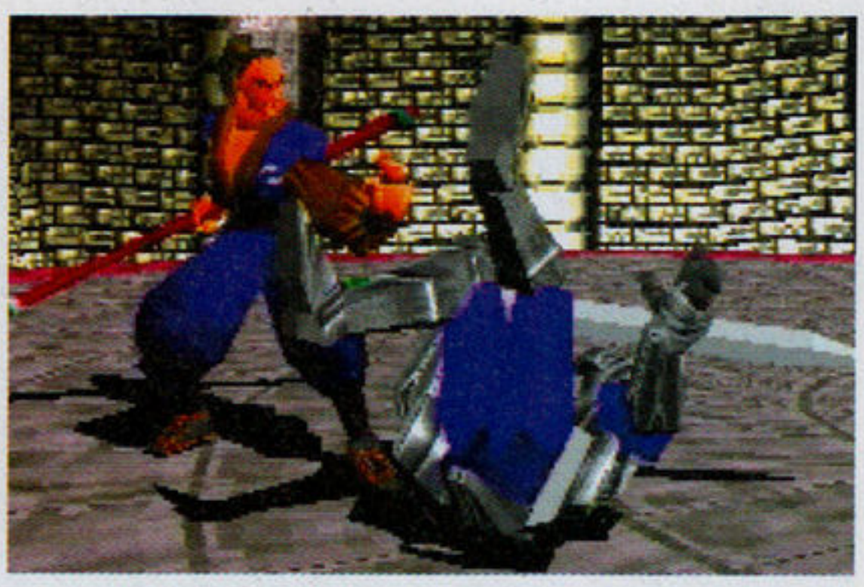
it is...

Andy Capp's tavern, a pool bar in Sunnyvale, California. In fall, 1972, Bushnell secured a spot next to a pinball machine to debut his brainchild. The game broke down on its second day, after taking in too many quarters

of boards carrying the CD drive and processors in a clumsy three-tier configuration. A tangle of wires and ribbon cables are necessary to complete the circuit.

But, of course, the real proof of the console is in the playing. And while Saturn has proven its worth with *Virtua Fighter* and *Clockwork Knight*, the PlayStation has stolen the limelight with *Ridge Racer*, *Motor Toon GP* and *Toh Shin Den*. Unless Sega's technology has hidden depths, it looks like it has been outclassed and overpowered by the Sony hardware.

Sony has just completed formation of Sony Computer Entertainment (USA), a new division of Sony Electronic Publishing which is dedicated to managing the PlayStation business in the US and Canada. This completes Sony's organizational structure for the launch of the PlayStation later this year.



***Virtua Fighter* (left) is still, as yet, the only reason to buy a Saturn. The PlayStation's *Toh Shin Den* (right) puts up a decent challenge with some gorgeous graphics. But, as always, it's down to playability and *Virtua Fighter* wins out**

Steve Race has been appointed president of the new division, having masterminded the launch of Reebok's highly successful PUMP range. The Sony hierarchy is such that Race now reports to Olaf Olafsson, president of the US Sony Electronic Publishing Company. Next month's **NEXT Generation** features an exclusive interview with Race and his plans for the US launch of PlayStation this fall.

Sony's commitment to the PlayStation and a successful 1995 launch extended to a technical workshop which took place at London's Royal Lancaster Hotel in January. The program of events covered both the commercial and technical potential of the PlayStation and was attended by delegates from SCE Japan, most notably its deputy president, Terihusa Tokunaka, and Ken Kutaragi, who is the designer and inventor of the PlayStation.

NDAs notwithstanding, a full report will be in the next issue.

at the Las Vegas CES, Sega named Softimage 3D as the official 3D development tool for the Saturn. Formerly known as Creative Environment, Microsoft's 3D rendering and animation package now incorporates the Softimage name due to its recognition throughout the development community.

Microsoft will be enhancing the Softimage 3D software and releasing it as a toolkit for Saturn development. In return, Sega will purchase a "substantial number of licences" for the toolkit and include it in its official Saturn development package for independent third party developers.

The toolkit incorporates a 2D paint retoucher, enabling artists to alter texture mapping in 2D and see the results realtime in 3D; plus an advanced interactive color reduction tool, which allows users to switch between 24bit space and the requisite number of bit-planes; and a Saturn file-format on-line viewer, which provides previews of Softimage-generated files at Saturn resolution. Softimage 3D also boasts leading motion-capture technology, as used to generate the lifelike animation in *Virtua Fighter*.

Yu Suzuki, director of Sega's amusement software R&D headquarters, is quoted as saying: "We selected Softimage 3D after evaluating the other major 3D products on the market. Sega has used Softimage tools for all of our amusement games for a number of years. Softimage 3D offers a shorter learning curve and higher productivity while delivering top-quality results."

Softimage 3D costs from $8,000 for the basic package to $20,000 for Softimage 3D Extreme, including Eddie, a special effects, compositing and paint package. ng

Data stream

Number of games sold in one pre-Christmas week: **321,121**
Average cost per game: **$74**
Proportion of videogame sales for by Sega and Nintendo: **73%**
Sales forecasts for *Donkey Kong Country* at the beginning of January: **225,000**
Ocean's turnover in 1994: **$94 million**
NEC's net sales in 1993: **$36 million**
Number of people employed by NEC: **191,000**
Number of products manufactured by NEC: **15,000**
Number of PCs to be shipped in 1995: **50 million**
Projected revenue from PC sales by year's end 1997: **$22.4 billion**
Approximate number of US porn magazine titles: **200**
Yearly revenues generated by pornography in the US: **$1 billion**
Number of copies of *Playboy* and *Penthouse* bought every working hour in the US: **43,808**
Annual income per person of population generated by porn magazines in Sweden: **$6.6**
Annual income per head of population generated by porn magazines in the UK: **$14.40**
Value of the telecommunications industry: **$105 billion**
Number of daily pornographic pictures downloaded from Delft University, The Netherlands: **30,000**
Percentage of male postings in the Internet newsgroup alt.feminism: **74%**
Most popular topic on the usenet: **sex**
12th most popular topic on the usenet: **education**

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>>It's fresh, innovative, with breakthrough technology. Let me give
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Why Walk When You Can Fly?

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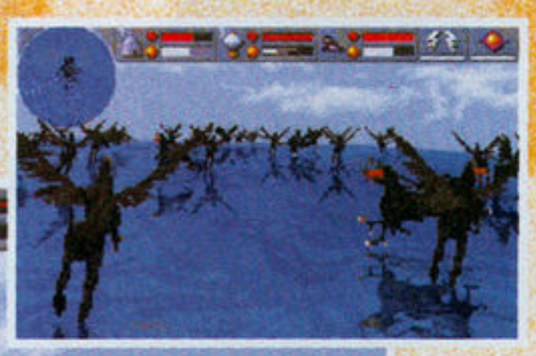
>only way to go.
>>In Magic Carpet you
>rip and dive through
>a 3D fractal world.
>>The landscapes morph in real-time
>while the frame rate stays high.
>>We like it.>>

Why Be A Hall Monitor?

>>The outdoors
>are nice.
>>Wouldn't you
>say?>>



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>leave a path of destruction through, you'll
>never get claustrophobic. >Of course, that
>also means no easy corners to protect you
>from the hordes of unrelenting beasts.>>

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>>Doom gives you the >BFG9000. >>They should've called >it the "B.F.D." >Magic Carpet gives you a >lot of wicked spells. >(24, for people who >like numbers.) >The result is a variety >of imaginative ways to kill things: >>lightning storms, volcanos, meteors.>>

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Or search for the carpet.zip file on your favorite service
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>>Or go Analog and dial 1-800-245-4525 and we'll send you the demo
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JOYRIDING

by Bernard Yee

gaming updates from cyberspace — this month: gaming LANs

Want the ultimate gaming setup? Sure, one of the Zenith Pentium 90MHz systems with the integrated PCI ATI Graphics Pro Turbo integrated on the motherboard would be nice. Fast and powerful, yes, but that system has something else the ultimate game machine should have. That's right, a network.

You've heard of them, LANs (local area networks), WANs (wide area networks), client/servers, nodes, Ethernet, Novell — all stuff you'd find in an office, right? Networks are simply high-speed connections between computers that enable them to share data. Office LANs usually center around a server, which contains most of the data, and then clients (or 'nodes') are the computers which access this data. These LANs involve complex setups, but the other form of networks — a peer-to-peer LAN — are considerably easier to set up. A peer-to-peer network is where each computer is autonomous but can share its data with other computers on the network.

Intel discovered that LANs have a use outside of the office — gaming. *Doom* death matches brought the chip giants' network to its knees as Intel employees leveled virtual shotguns at each other and let fly. Intel outlawed *Doom*, and many other network-driven companies have restricted *Doom* to after-hours only. Networks allow gamers to play with or against other people — the essence of on-line gaming. Playing *Doom* solo just doesn't float my boat — it becomes an exercise in repetition, more of the same: bigger, badder — and boring. But add a few friends on a network, and a *Doom* death match becomes one of the most exciting gaming experiences available on the computer.

Doom isn't alone, either. Network support has been around for some time, and more and more games are coming equipped for multiplayer, modem, and network support. *Falcon 3.0* enabled virtual pilots to fly missions together. *Doom* and *Doom II* come ready to network. Apogee's *Doom-killer, Rise of the Triad* is network friendly. Origin System's *Wing Commander Armada* runs a VGA-only prototype of the stunning *Wing Commander III* engine and enables you to fly head-to-head over network and modem. Looking Glass Technologies' *Terra Nova* (see page 60) incorporates network support. Let's face it — nothing beats playing against a real, live, sneaky, crafty, SOB human. That's why so many games have flocked to on-line networks, like the ImagiNation Network's *Red Baron* or Genie's *Multiplayer Battletech*: because you get to play against human, not artificial, intelligence.

How can you set up a network? It's easy, actually. You've got your game machine, probably a 486DX2-66 or a Pentium for the fortunate. Have an old, nonlocal bus 486 (or even a 386) sitting around gathering dust? A notebook? Both? You have a three node network almost ready to go. A 386? A Cyrix 386 to 486 chip upgrade will speed up your system. Have a poky 486DX-33? Intel just lowered prices for its 486DX4-100 Overdrive Processor, giving you near-Pentium performance. This should get your systems up to speed.

You'll need a network card for all your computers. A network card is essentially a high-speed data port, like your serial port on steroids. Cards are made by companies like Intel and 3Com, but before you choose, you'll need to decide what kind of cable you'll want to use for your network, as well as the topography of your network. Coaxial cable (like the cable for cable TV) is called thin-wire Ethernet and can "daisy-chain" the computers together. Thick Ethernet looks like a printer cable, and is rarely used anymore. The drawback to daisy-chaining your nodes on the network is that if the middle node fails, systems on either end of the failed node will not be able to talk to each other. The upside to this topology is that it is cheap to set up.

Many LANs use "star" topography, where the nodes are linked to a hub with twisted-pair Ethernet, or RJ-45 cable, which resembles thick telephone cable lines. A hub is the small black box which coordinates the information traveling back and forth to the nodes on the network. The wires are smaller, the network is more reliable, but will cost more since you need to buy a hub. Wireless LANs are now becoming very popular, but the cost is too high for home use.

The last thing you'll need is an operating system that can use the network. Microsoft Windows for Workgroups 3.11 and the upcoming Windows 95 both come with integrated peer-to-peer network support, but most network-ready games support Novell Netware network protocols. That means you'll need a copy of Novell's Personal Netware which has a license for five nodes. You'll need to make sure your software is licensed to run on all your nodes.

Setting a network up isn't cheap, but if you work at home or in a small office, or use a notebook and a desktop system, a network will make you more productive. You can share files, share printers, and run networked applications. You will also have the hottest gaming setup in the neighborhood, and when you invite some friends over for a *Doom II* death match, you will have hours of knuckle-whitening fun. Tell the IRS your network is a business expense; it doesn't have to know that what you really want to do after work is to stalk your friends down hallways, BFG-9000 in hand, ready to give 'em hell. After all, the IRS guys are probably too busy playing *Doom* on their own network to care.

Next Month: Joyriding tells you where the action is

The real **interactive** movie

It's not CD-based, it's not Pentium-compatible, but it really does have a multiple-player option...

The phrase 'interactive movie' has, in the past, been applied to products that were only vaguely movie-like and not terribly interactive. However, a real interactive movie is to be released across the US on February 17. Devised by Interfilm Inc. and produced by Sony New Technologies, this movie has its origins in Hollywood rather than a software house. The film, called *Mr. Payback*, lets the audience decide the plot using a voting system attached to the cinema seat armrests. Onscreen prompts appear at vital junctures in the plot, at which point the audience hits one of the buttons to select what happens next. Over two hours of footage was shot, of which 20 minutes' worth is viewed during each sitting.

Audiences took to the joystick-based system with enthusiasm (top). Whenever a plot-altering decision occurs, the arm-rest buttons light up (middle). Star of *Mr. Payback*, *Baywatch*'s Billy Warlock (bottom)

Bob Gale, writer and producer of *Back To The Future* has penned and helmed *Mr. Payback*, and Sony has ensured that well-known faces star in the film. Christopher Lloyd, who played Doc in *Back To The Future*, and Billy Warlock from *Baywatch* head the cast, with others making cameo appearances.

The system operates by holding all possible clips on LaserDiscs. Each chapter is accessed according to the wishes of the majority of the audience and displayed onscreen using the Interfilm exhibition system. The modifications that each auditorium is required to make are minimal.

The videogame market still isn't taken seriously despite being worth considerably more than the film industry. This interactive movie is unlikely to change that, but it may enlighten some of the less bigoted individuals who try it. ng

Essential reading

Rebel Assault: The Official Insider's Guide

Joe Hutsko
Publisher: Prima Publishing
Release Date: Available now
107 pages

The essentials of this book whittle down to Vince Lee, who practically gave birth finishing *Rebel Assault*, and the almost infinite spectacle of *Star Wars*, the 18-year-old movie that refuses to die.

While focused on the people who made *Rebel Assault*, the designers through the part-time temps — with pictures of each smiling employee — *Rebel Assault* is about something else, too: the never-ending capitalization of a product.

The story of *Rebel Assault*'s creation is interesting both from a management point of view (minor chaos), as well as for its technical merits (thank god for SMUSH!), as its pace builds into a frantic crescendo. Black and white *Star Wars*' captures, initial sketches, wire-frame models, rendered shots, and a lot more fill the large format book, while catchy, full-color insider's tips appear in the book's midsection for strategy-hungry gameplayers.

But the *Star Wars* sheen wares off in this medium. Certainly the mechanics of how the CD-ROM was made, while fascinating to crazy Luke Skywalker fans and science fiction buffs, isn't as interesting as watching the movie or playing the game, right?

Game Over

David Sheff
Publisher: Vintage Books
Release Date: Available now
434 pages

David Sheff's outstanding narrative of the rise of Nintendo is now in paperback. But *Game Over* is more than simply the origins of *Mario*, it aims to be a bible to students of the videogaming industry itself. From Nolan Bushnell's *Pong*, to the philosophical origins of 3DO, via Sega's dominance of the 16bit marketplace, incorporating the legal scramble for the rights to *Tetris* — *Game Over* paints a colorful picture of how videogaming came to be the way it is.

While the tendency to stray from the path of Nintendo's story, on the one hand, delivers extra depth and context, it leaves the reader feeling that *Game Over,* is simply an unbalanced chronicle of gaming itself — with the misbalance in favor of Nintendo. This is perhaps the only flaw in an otherwise well-researched and highly readable book.

NEXT Generation uses *Game Over* as a reference guide on a day-to-day basis, and we really can't give any higher recommendation than that.

Movers & Shakers

A monthly look at **business news** affecting the **gaming world**

by Selby Bateman

Selby Bateman, the executive editor of *CD-ROM Today* and *The Net*, two of the most respected leisure computing magazines in the US

GTE + NOA SPELLS MUSCLE

NEWSLINE: GTE Interactive Media and Nintendo of America showed off the new 3D *FX Fighter* game during the Consumer Electronics Show, one of several joint ventures the two companies will create and market together — also including Ultra 64 cooperation.

BOTTOMLINE: *FX Fighter* may be the least of the excitement to be created by the collaboration between GTE, a division of the $20 billion GTE Corporation, and Nintendo. Their promise to work together to provide on-line network gaming and interactive service delivery will almost certainly make them leading players in the on-line gaming wave about to hit our shores this year and next.

***FX Fighter* is Nintendo's new polygon-based fightin game**

GAMES — GET 'EM WHILE THEY'RE HOT

NEWSLINE: On-line services like CompuServe and America On-Line now provide an increasing array of shareware and first-level versions of top computer games from leading commercial software publishers. There's CompuServe's Hot Games Download Area, where samples of GT Interactive's *Doom II*, Id's *Heretic*, Interplay's *Descent*, and LucasArts' *Dark Forces* await you.

BOTTOMLINE: Just as with The Sega Channel, XBand, and the ImagiNation Network, games can be provided in many ways, not just through store-front retail operations. Will you buy/rent your games from the comfort of your keyboard or controller pad rather than the mall? You bet you will. Will game publishers try to bypass retail stores whenever possible? You bet they will.

DISNEY GETS DISSED

NEWSLINE: Disney Interactive sold more than 200,000 copies of *The Lion King* CD-ROM game during the holiday season. *Then* it found out a lot of *Lion King* fans with computers didn't yet have a 16bit sound card and didn't know an MPC Level 2 multimedia specification from the far-flung Isles of Langerham.

BOTTOMLINE: While Disney made a tidy sum by licensing titles to videogame publishers, multimedia is a very different animal. Disney got mauled by angry parents and the press. But, saying it has learned its lesson, Disney is pushing forward to build a much bigger multimedia game development operation.

16BIT: WHO'LL MAKE MONEY?

NEWSLINE: Greg Fischback, CEO of Acclaim Entertainment, says his company will. But, he adds, maybe three other 16bit publishers will be able to afford the marketing and distribution wars this year. Titles such as *NBA Jam Tournament Edition* have to be heavily marketed and released across multiple platforms to become Megahits.

BOTTOMLINE: The ground rules for winning videogame wars have changed. In the late '80s, a flood of new 8bit game licensees made money by just getting the carts onto shelves; fewer did the same with 16bit Nintendo and Sega games. Acclaim's $50 million marketing budget for 1995 is not a ballpark just anyone can play in. But that's what it takes to make 16bit bestsellers happen as we head toward the new 32bit and 64bit platforms.

A DREAM-TEAM WALKING

NEWSLINE: Four bodyguards surrounded the entertainment world's latest dream team as they walked the floor at Winter CES. The founders of the newest Hollywood studio, DreamWorks, include Steven Spielberg, Jeffrey Katzenberg, and David Geffen. They were walking about with friend Barry Diller. Enough combined motion picture, music industry, and television firepower to start a revolution.

BOTTOMLINE: The visitors were being guided around by Knowledge Adventure's founder, Bill Gross, and the tour included a behind-the-scenes meeting with Sega execs. This is a high-profile example of just how fascinated Hollywood is with the potential of interactive entertainment and multimedia products. Expect DreamWorks to announce strategic alliances in the interactive world before too long.

3DO ON THE OFFENSIVE

NEWSLINE: Following a better-than-expected holiday season and the introduction of Panasonic's new "clam-shell"-design FZ-10 model 3DO player (SRP $399.95), 3DO continues to push forward. Add to that Goldstar's MPEG decoder ($199.95) that lets 3DO owners play high-quality CD-movies.

BOTTOMLINE: The next phase is a big effort to increase 3DO's affiliated-label list to keep the software surge high. Domark Software, in the midst of its own North American expansion, recently signed up and brings titles like *Flying Nightmares* to 3DO. With other affiliates — L3 and Tetragon, for examples — 3DO is trying to convince software houses to stay the

***Flying Nightmares*, among others, marks 3DO's game surge**

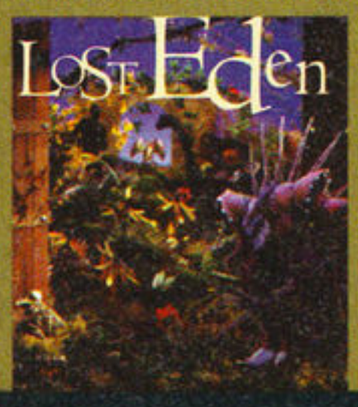
IT'S LIKE GOING BACK TO THE MESOZOIC ERA.

ONLY THIS TIME YOU GET TO WALK UPRIGHT.

It may be Eden, but a garden it's not. It's a primeval land filled with rain forests, marshy plains and flesh-eating neighbors named "Rex." Not to mention a slew of other dinosaurs, from the peaceful, grass-eating Brontosaurus to the brutal Velociraptor. In Lost Eden, you play Adam--not the first man on Earth, but possibly the last. That is, if you can't unite the creatures of four continents against a tyrannical Tyrannosaurus Rex. The task is simple: Save mankind. If you're successful, you're a hero. If you fail, you're a fossil.

- Interact with over 12 different dinosaurs.
- Lush, surrealistic graphics, cinematics and texture-mapped sequences.
- Explore four different continents and seven types of terrain.
- 60 minutes of original ambient CD-quality soundtrack and digitized speech.
- Made by the same people who created DUNE™ CD-ROM.

Lost Eden. The only adventure strategy game that brings you back to Eden.



Arcadia

An insider of the **coin-op** business gives you the **skinny** on link-ups, arcade parks, and more

Marcus Webb is the editor-in-chief of *RePlay* magazine, the US's leading trade amusement magazine

by Marcus Webb

Videogame tournaments with *NBA Jam* have become crowd favorites

NANI Testing

The National Amusement Network, Inc is still moving toward creating a nationwide, modem-linked network for videogame tournaments in arcades. NANI has ironed out final bugs in the technical program for its networked games. Next step is market testing, and NANI has placed 25 network-capable *NBA Jam* games with half a dozen or so Kansas arcade owners. Another 25 games are expected to go to Ohio. NANI will then try out its tournament formats, etc., before expanding the arcade network program to the national level.

Games like *Daytona USA* may rise to $1 per play by 1997 using a new $1 coin

Kung Lao, with the razor-rimmed hat, appears in *Mortal Kombat III*

Dollar Coins

These days, US arcade fans enjoy the lowest price-per-play of any videogame players in the world. Many games in the US are still set on 25¢ or 50¢, whereas in Asia and Europe they would cost the equivalent of $1 or more. Maybe you've noticed some of the fancier new simulators like Sega's *Daytona USA* and Namco's *Ace Driver*? That's because those games cost the arcade around $20,000 each.

But the videogame industry would like a chance to boost play pricing across the board, so for the last several years their top lobbying priority in Washington, DC, has been convincing Congress to get rid of dollar bills and replace them with dollar coins. They're looking for a new design, not a replacement of the failed Susan B. Anthony dollar coin. (The vending industry and others have supported all this, by the way.) Despite all the lobbying efforts, dollar coins have been a lost cause...until the Republicans literally took over Congress last November.

The new GOP majority seems much more favorable toward dollar coins, which would save Uncle Sam more than $300 million annually in paper currency replacement costs. And, they're not wasting any time getting started on the idea. Rep. Kolbe introduced HR. 534, the dollar coin act of 1995, on January 17. Insiders say dollar coin legislation could finally pass this year. if so, look for a one-year design period, followed by an introduction of the new coin by 1997. If the US follows the example of Canada, Australia, and several others, coins would gradually replace bills in a three-year phase-out. Once dollar coins are in circulation, you can expect videogame factories to lock in dollar-per-play pricing during the manufacturing process on many more games, and expect the arcades to support manufacturers in pushing US play-pricing up to world levels as quickly as possible.

New Arcade Video Titles Coming

Capcom's *X-Men* was released in the arcades this last February. The game is already getting lots of positive hype and buzz from video fans on CompuServe. Meanwhile a London trade show in January provided sneak previews of games "coming this summer to an arcade near you." *Sega Rally Championship* (see page 70) is a driving simulator with its upgraded Model 3 computer graphics board for even better than last year's stunning *Daytona USA*. A shock generation system mirrors the movement of the car delivering bumps and knocks through the players seat. Jaleco will have a sitdown driver called *Super Circuit Red Zone*, the gameplay of which is based on Tokyo highways. Kaneko is touting *Jackie Chan*, a fighting game featuring digitized graphics of the martial arts B-movie star. Kaneko is also working on a racing game called *Million Miglia 2*. Up to four cabinets can be linked together.

***Mortal** Kombat III*

Williams/Bally-Midway has been providing sneak previews of *Mortal Kombat III* — its sound and graphics, anyways — to players over the CompuServe network since late 1994. We checked with the factory's Roger Sharpe, who said that the coin-op *Mortal Kombat III* was still under development as of late January, but it could possibly arrive in arcades before May. No firm release date has been set for subsequent home version, Sharpe said, but he confirmed *Mortal Kombat III* would probably be part of the '95 winter holiday home-game push. Sharpe denied reports that *Mortal Kombat III* would be programmed differently for different regions of country. He also scotched rumors that *Mortal Kombat III* would contain "cross-over" characters from *Killer Instinct*, Midway's current hit.

Virgin, Sony to Enter Coin-op Arena

Its PR firm is keeping mum, but Virgin, a leading home videogame firm, is planning to set up a coin-op division according to industry insiders. Word is, they've got a headhunter in Northern California going over resumes of industry execs. Sony Computer Entertainment has opened an office in Foster City, CA to manage US business for its forthcoming home game system, the PlayStation. Reliable sources say Sony also has plans to open a coin-op division. Meanwhile, Sony is also joining forces with Microsoft to create a two-way interactive home TV service. Videogames will be part of the programming, naturally.

breaking

Pippin debuts as Bandai's Power Player

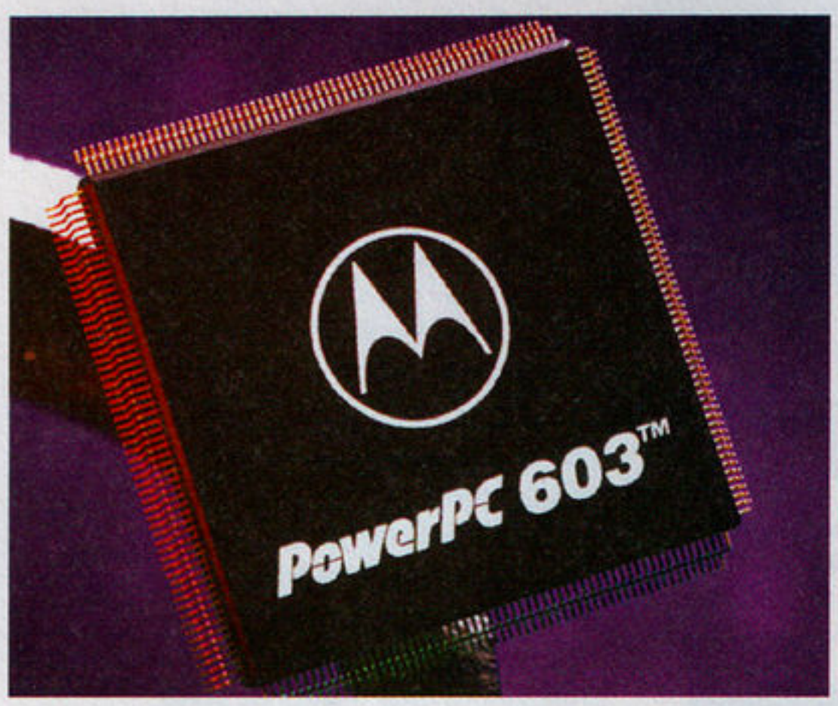
The first incarnation of Apple's PowerPC-based CD console set for winter holiday 1995 release

Apple's first Pippin licensee is Japanese toy giant Bandai, whose own 8bit CD-based console, the BA-X, released last fall in Japan. Bandai's Pippin, 'Power Player,' is expected to sell for $500.

Both Apple and Bandai are reluctant to reveal many details about the Pippin's technical specifications. What is certain is that it will be powered by the 64bit PowerPC 603 RISC processor manufactured by Motorola; that it will use a subset or runtime version of MacOS, complete with QuickTime and QuickDraw; and that it will have a quad-speed CD-ROM drive. It's almost certain Pippin will also feature MPEG encoding for full-motion video. One developer who saw Pippin running told **NEXT Generation** reporters that it blew away the competition, implying that it will have its own custom graphics hardware.

However, Apple ensures that Pippin is broadly compatible with full-size Macs. The Pippin and PowerPC titles should be interchangeable, and Mac software not coded for the PowerPC will use the services of a 64K emulator built into the console. So Pippin users should be able to take advantage of the full range of Macintosh titles.

Pippin is a major departure for Apple — it's the first time the company has licensed its widely respected Macintosh technology to a third party. The recent deal with Bandai is a clear attempt for Apple to gain new ground in the home market that has, thus far, eluded the Cupertino-based computer pioneer.



Pippin's CPU will be built around the base-model PowerPC chip, the 603, developed by Apple in conjunction with Motorola and IBM

"Bandai's strength in the entertainment industry paired with Apple's legacy in education and leadership in easy-to-use multimedia products will provide customers with an unparalleled home entertainment and education tool," trumpeted Satjiv S. Chahil, vice president of Apple's New Media Group.

Also, a $500 price tag would certainly undercut a decent multimedia PC by about $1,000. But while Apple openly admits that Pippin will be a player rather than a computer — with no applications and no keyboard upgrade — the machine is targeted at the same territory that the Philips' CD-i has so obviously failed to conquer. Bandai's influence may change all that, despite the fact that Bandai's own *Mighty Morphin' Power Rangers* is scheduled to star in the first game for the system.

Pippin's first hardware licensee, Bandai, recently released its own 8bit CD console, the BA-X, in Japan

GLINT gets Creative

3Dlabs' collaboration with the Singapore sound giant, Creative Labs, is producing tangible results. GLINT chips [see NG 1] are now available in numbers and boards are being distributed to developers. Creative, manufacturer of the dominant SoundBlaster soundcard for the PC, is scheduling the release of a PC games card for the end of 1995 incorporating both SoundBlaster and GLINT chips, which aims to set a powerful standard for a machine currently dogged by incompatibility problems. The expected shipping price is $250.

Generator

by Mark James Ramshaw

Delve into behind-the-scenes development, hot gossip, hard facts, and industry comment

This month Generator turns its attention to the shiny, happy world of compact discs.

Put simply, it's not a satisfactory format. Sure, it's a great leap forward from floppy discs, and despite the nonviability of writable CDs it's already becoming the standard format on which to buy game software. As a storage medium, however, it just doesn't hack it. Or at least that's what Hollywood has decided, in any case.

It seems that the big wigs in movieland are behind the latest efforts to increase the storage power of CDs, with the aim of bringing full-length movies in MPEG2 format onto a single, standard-size CD, with accompanying compressed, digital audio and subtitling. With a joint proposal from Sony and Philips, it looks like they're going to get their wish.

The new high-density compact disc format — that's HDCD — isn't due for finalized specifications until the year's end, but already available is a draft proposal for interested parties. The specs sound fantastic — a single disc is capable of storing a capacity of 3.7 gigabytes and uses a 635 nanometer (red) laser. The distance between tracks is reduced, and there is a reduction in size of the actual pits on the disc. But more sophisticated error correction methods are needed, as are improved modulation techniques to increase the resolution in this way. The optical part of the drive will also be more expensive than the current standard — there is no domestic red laser on the market at the moment — so mass production will be essential to decrease prices. Another sizable problem which needs to be addressed with using a laser of the proposed wavelength is that a greater operating temperature will be required.

However many the problems, the benefits from such an increased capacity are obvious. If it's used in conjunction with a dual-layered disc method, also by Sony and Philips in collaboration with 3M, the capacity can be even further increased to 7.4 GBs.

Thankfully, we may be spared incompatibility problems with this new system. A voluntary group of experts from Apple, IBM, Compaq, and Microsoft have already met to work out extensions of the volume and file standards for HDCD-ROM; among other things, this group of experts recommended a standard which would allow backward compatibility.

The benefits of HDCD stretch far beyond what Hollywood has in mind. For starters, the price of products — which would previously have occupied several CDs — should decrease. And with graphic detail taking up increasing amounts of CD space these days, it's only a matter of time before current CDs just won't hold enough data (with several titles that's already the case). True, it means we'll be subjected to even more heavily rendered gameplay-free titles — but there's a price to pay with every new development. The bottom line is this: more storage space will be a major benefit for the industry.

And on a final Hollywood-related note, Bill Gates is currently talking with former Disney chief Steven Katzenberg, music and movie production supremo David Geffen, and the one and only Steven Spielberg. If you're the billionaire CEO of Microsoft, you might as well get the best money can buy for your new multimedia entertainment division.

Mark Ramshaw is an exgame producer, a free-lance writer, a game designer, and music critic

Datebook

March

New Media '95 March 14-16, 1995 Los Angeles, CA, LA Convention Center. Chiefly for corporate managers, technology enablers, information transporters, content providers, and those interested in business and revenue opportunities based on new technologies. 15,000 total people attend. 140 companies will exhibit. Reflects the major aspects of the digital revolution. Booths will appear on a show floor, and the conference is educationally based. There will be 40 conference sessions on various topics. For more information call The Interface Group at (617) 449-6600 and ask for attendee registration.

Computer Games Developers' Conference in conjunction with the Santa Clara Convention Center Saturday night through Tuesday night April 22-26 Westin Hotel, Santa Clara. Organized by computer developers for computer developers. This annual conference is composed of seminars that range for in-house and independent developers on topics such as art, animation, sound, playability, interface, legal issues for independent developers, etc.; meals included; booths are very limited. This is not a marketing conference. Awards for various games, and an awards banquet. Open to the public. Between $275-$650. Call (415) 948-2432 (CGDC).

April

Spring Internet World '95 Monday through Wednesday, April 10-12. The Hotel Sainte Claire, the Hilton, and the Fairmont have special arrangements for lodging arrangements. Open to the Public. This year's focus is primarily on the World Wide Web, although every aspect of on-line products and multitudes of information can be found. An adjunct conference will be held featuring seminars, tutorials, etc. Cost for the main show is $10; the cost for the conference ranges. For more information please call Internet World or Meckler Media at 1 (800) MECKLER (632-5537).

May

Selling and Marketing Mega Show May 2-4, 1995 New York, NY. Showcases the latest ideas, leading edge tools, and educational seminars in the sales, marketing, and customer service businesses. More than 1,400 exhibits. Consists of three major shows: sales, marketing, and incentive education programs. Seminars include sales, marketing, people performance management, incentive planning and more. Programs presented by Assoc. of Sales Professionals, the Promotion Marketing Association of America, Trade Show Bureau, Meeting Planners International, etc. Call Miller Freeman, Inc. (800) 950-1314.

E3 (Electronic Entertainment Expo) May 11-13, 1995 LA, CA. Showcases entertainment software, retail products, video, book catalog, record and other mediums. Designed for entertainment software title publishers, developers, content providers, and property rights marketers. Call Knowledge Industry Pub. at (914) 328-9157.

SHOW ORGANIZERS: If your show isn't listed here, it's because you haven't told **NEXT Generation** about it. Do so by calling (415) 696-1688, or FAX information to (415) 696-1678, or send details to DATEBOOK, **NEXT Generation**, 1350 Old Bayshore Highway, Suite 210, Burlingame, CA 94010.

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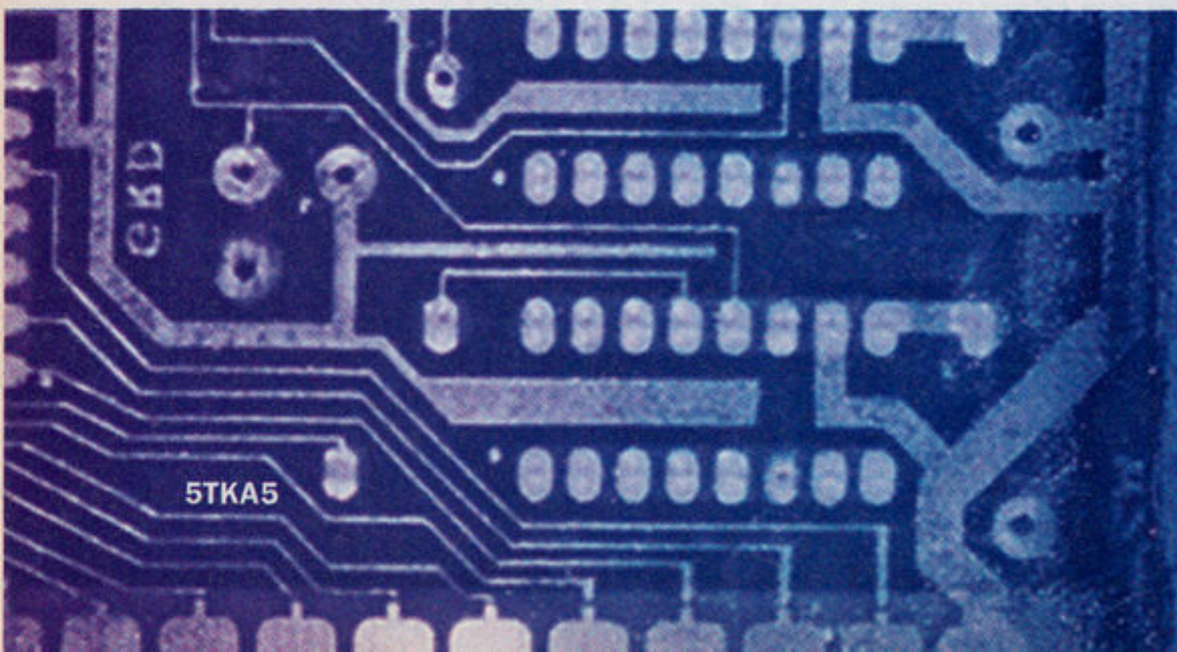

NEXT GENERATION

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ng hardware

NEXT GENERATION February 1994

Sega
Saturn

In January 1993, Sega announced the development of a 32bit console that would take videogames from the fading age of 16bit into a bright new era. For a while, the future belonged to Sega.

But it didn't stay that simple for long. Last month the Saturn arrived in Japan after a grueling journey from conception to hard plastic. So what has Sega achieved? NEXT Generation investigates...

Tech Specs

CPU
2 x SH-2 32bit CPU @ 28MHz
Memory
- VRAM: 12Mbits
- Main RAM: 16Mbits
- Sound RAM: 512K
- Buffer RAM: 512K
- Boot ROM: 512K
- Battery RAM: 32K

Graphics
- Resolution: 352 x 224 or 640 x 224
- Colors: 24bit palette 32,000 onscreen
- Sprites/polygons: VDP1 chip, dual frame buffer
- Backgrounds: VDP2 chip: 5 planes, 2 rotation planes

Sound
- 16bit 68EC000 processor @ 11.3MHz
- Yamaha FH1 processor
- PM, PCM, 44.1Khz sampling frequency, 32 voices
- DSP 128 steps/44Khz

Data storage
- Double-speed CD-ROM drive
- Cartridge slot

It wasn't supposed to happen. The possibility that its next-gen hardware would face serious competition simply hadn't figured in Sega's calculations. So when news broke in November 1993 that Sony was developing a videogame system capable of revolutionary performance, all hell broke loose. Those who had seen the machine working claimed that it was far more powerful than anything Sega had planned. Most threatening was the disclosure that it was to be released in late 1994 – the same time as the Saturn. To Sega's dismay, a powerful new rival had practically arisen overnight.

Sega's president, the feared Hayao Nakayama, was among the first to be informed. His reaction was typical. He immediately marched down to his consumer research and development

ng hardware

PlayStation

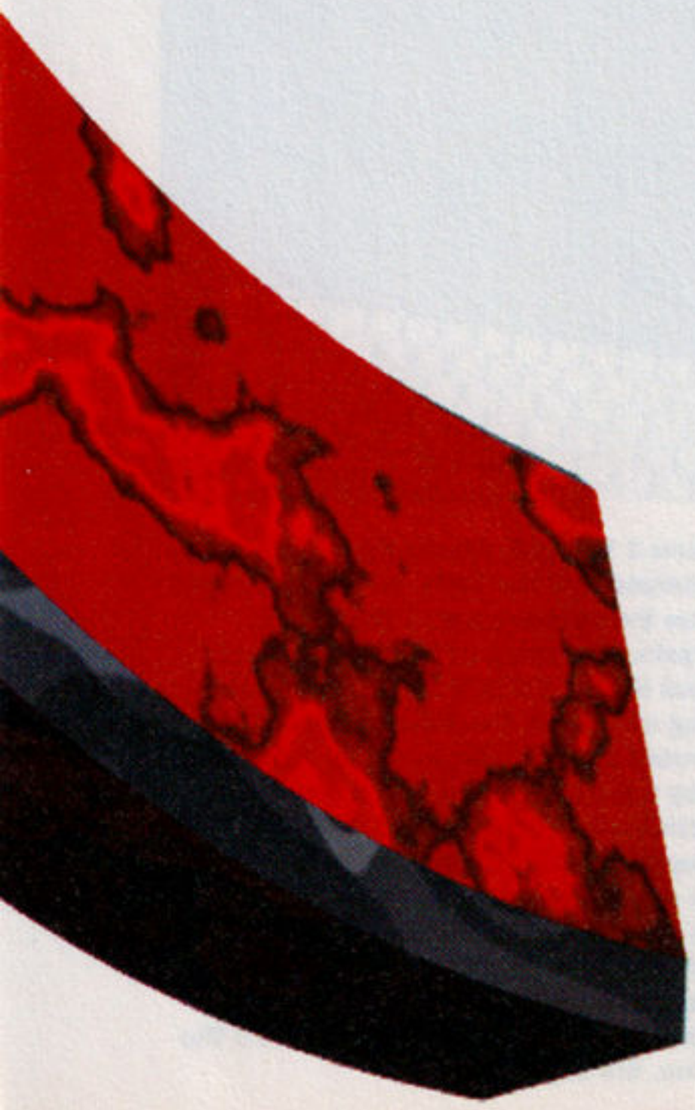
The wait is over. The PlayStation has been launched in Japan and Sony has joined the elite club of console manufacturers. But what does Sony know about videogames? How can it possibly compete with the likes of Nintendo? NEXT Generation weighs its chances of success

Sony's bid for power

It's early December in Tokyo. The holiday buying season has started in earnest and The Land Of The Rising Sun is in the grip of its annual frenzy of consumerism. Swarms of fashion-conscious, young Japanese pour in and out of expensive department stores, subway trains groan under the weight of weary shoppers, and the world's electronic goods Mecca, Akihabara, pulsates under a skyline of shimmering neon. In the midst of this buying mania, Sony rolls out its single

magazines already have

Atari: from boom to bust and back again



The oldest videogame company of them all once held an entire industry in its grasp. And then it threw it all away. So why is Atari now back in the running?

The dominant position of Japanese consoles in today's videogame market makes it easy to forget that the original market leader in home video consoles was an American company.

Atari arrived on the scene 23 years ago. Given that at the beginning it had a clear field, you would have thought that it would still be a major force. Not so. Many gamers fail to realize that in business terms, Atari is a minnow swimming with the sharks of Nintendo, Sega, and Sony. Atari is a company that has managed to exist almost despite itself.

During the 1970s it was the equivalent of Nintendo, conquering the world with its VCS 2600 console. Somewhere along the line, though, it lost the plot. Thanks to some disastrous marketing decisions, the company changed hands, moved from console to computer development, made plenty of money off the back of the ST

ng special

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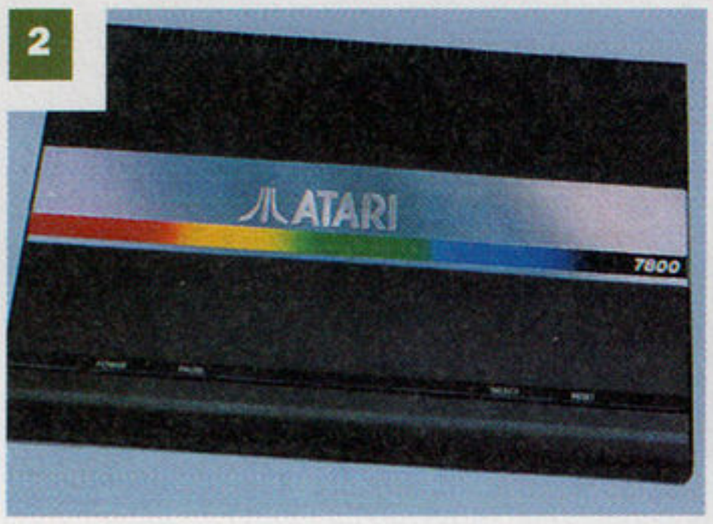

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Atari hardware: 1 The VCS, Atari's first venture into home entertainment. 2 The 7800, released at about the same time the bubble burst. 3 The 800XL, second in Atari's first range of home computers. 4 The first real ST, the STFM. 5 Its successor, the STE, featuring a blitter. 6 The STacey, a portable machine devoted to music applications. 7 The Mega STE, featuring 1 MB of memory (and a pretty box). 8 The TT, which made a break with the regular ST but was still compatible with it. 9 The Falcon, which, among other enhancements, brought 32bit TrueColor to our screens. 10 The Lynx, a handheld color cart-driven gaming diversion. 11 The STBook, marketed simply as a portable ST. 12 The STPad, Atari's ill-fated handwriting-recognition tool 13 The latest machine, the Jaguar

range and then lost millions fighting Commodore. Now it has reentered the console market with its 64bit Jaguar machine, has been involved in a very interesting court case with Sega, and has decided to settle some old scores.

The entire list of Atari alumni is like a who's who of the computer and console industry. Many current leading industry figures have been involved, at one period of time or another, in the firm that reads like a straight history of videogames themselves.

Atari was founded in 1972 by a University of California engineering graduate named Nolan Bushnell. He had become interested in computer games during his time at college, where he played one of the very first, a primitive creation called *Space War*. So taken was he by this game that he decided to produce a version for himself in 1971, and so the very first arcade game, *Computer War*, was born. He took the design to a pinball company, which manufactured it. It bombed, big time.

Unperturbed, Bushnell decided to produce a much simpler product. After some thought, he designed a very uncomplicated tennis game which he called *Pong*. He built a prototype and, in 1972, after a successful trial of the machine, set up his own production line. Having scraped some cash together from friends, relatives, and the bank, Bushnell employed a group of technohippies (Steve Jobs and Steve Wozniak of Apple fame among them), who fought to keep up with hoped-for and somewhat surprising demand.

In those early days, Atari was breaking new ground. It released the first car racing game, called *Gran Trak*, and the first tank game, named (somewhat obscurely) *Tank*, which was also the first arcade game to store its graphics data on ROM. Shortly after the success of these machines, Atari released *Breakout*, a game that still gets released on new formats today.

By 1973, the company had 80 employees and Bushnell was looking for ways to fund new growth. He'd seen the potential that videogames had, but the company lacked the finances to exploit it. As a result, he sold the rights to *Pong* to Bally, the pinball company, which went on to sell thousands more units all across the world. With this cash injection the Atari engineers created *Sprint*, the first arcade machine to use a CPU to control the game.

What Bushnell really wanted, though, was a machine that could be used at home. He realized that although arcade games would always be popular, there was a massive domestic market just waiting to be tapped. It was with this in mind that he created the Atari VCS 2600 console. Its compact design, custom chips and sophisticated sound and graphics made it an instant hit when it was released in 1976 — the same people who played Atari games in the arcades could, for the first time, play them at home as well.

Around 1976, however, things started going wrong at Atari. The company had overstretched itself, particularly with the development of the Atari 800 computer, and so Bushnell sold Atari to the media conglomerate Time Warner for more than $20 million. He couldn't let go completely and remained with the firm as chairman.

At that time Atari adopted an attitude which was to be copied in the late '80s by

Atari acolyte Jeff Minter (*Defender, Tempest 2000*) is possibly Jaguar's strongest ally. Its success rides on the back of his games

the Japanese console companies. The primary competitor of the Atari 800 was the Apple II that Jobs and Wozniak had created in their garage. While the Apple was an open system, Atari threatened to sue anyone who developed software for its machine, figuring, correctly, that revenue came from software and not hardware. So while groundbreaking products like *Visi-Calc* (the first spreadsheet) were being created for the Apple, the Atari 800 suffered from a complete dearth of software.

In 1978, after an acrimonious dispute with Time Warner, Bushnell left Atari with a healthy golden handshake. After the dust settled, the company forged ahead with sales of its VCS and (for a while) it was unbeatable. By 1981 more than 20 million consoles had been sold and the arcade market had grown in just eight years to a value of $6 billion. Anyone with a stake in such a lucrative market could be forgiven for becoming complacent.

In those early days, everyone believed that the console market was untouchable. The industry had emerged from absolutely

"They **failed** because they thought their competition was Commodore, when it was actually **Nintendo** and **Sega**"

Peter Molyneux, Bullfrog

"There are too many machines in the marketplace. **Period**"

Jon Hare, Sensible Software

"We're the **Rolling Stones** of the video game industry. We might be the oldest kids on the block, but we're still **rocking**"

Darryl Still, Atari UK

ng special

nowhere to become the single largest component of the toy sector. All the traditional toy companies had scrambled to jump onboard, providing plenty of rivals for Atari. But what happened next had more to do with poor planning than the amount of competition in the field.

In 1983, the console market had reached saturation point. Everyone who wanted a home videogame system had bought one, and yet companies like Atari carried on churning out units. At one point, it was even producing more game cartridges than there were machines. It assumed that all it had to do was release games and the public would snap them up. But as many companies have discovered, public taste can't be taken for granted.

Every market has to keep the customer interested. Car companies release a range of models at a variety of prices. The music industry constantly offers up new talent for public consumption to keep the market moving. In its naivete and arrogance, the American videogame industry ignored these hard-learned lessons and in late 1983 the videogame market suffered a disastrous slump.

It was at this time in 1983 that Atari made a judgment which probably still gives executives nightmares. It was approached by a Japanese designer from a then little-known company called Nintendo and offered the worldwide rights to the Famicom console. Hiroshi Yamauchi figured that because Atari already had a worldwide distribution network, it would be the perfect company to set up a global release for his machine. In its wisdom, Atari blew the Japanese company out, and so Nintendo set about the task of worldwide domination on its own.

In that year Atari suffered a loss of $536 million. Time Warner couldn't cope with such a massive drain on its funds and scrambled to sell as quickly as it could. The computer and videogame divisions were sold to Jack Tramiel, the man who had been ousted from Commodore, the company he founded. The coin-op division, Atari Games, was sold to Masaya Nakamara at Namco. Time Warner was reluctant to burn its bridges, though, and cleverly hung on to a 25% stake in Atari and a 40% stake in Atari Games. While Tramiel plotted to beat Apple and Commodore at their own game, Nintendo hatched plans to rekindle the console market with the help of a plumber.

The 2600 was still the only console that counted when the Tramiels bought Atari. All they had to do was come up with a replacement for the aging machine and some decent software to play on it. At this stage they must have known that the 800 stood no chance against the Apple and the IBM PC. This is undoubtedly the point at which Sam Tramiel (the newly appointed president) told his engineers to come up with a completely new machine.

Atari released follow-ups to the 2600, in the form of the 7000 series, but these bombed in the face of the new Nintendo machine. Atari was by no means happy with the bold success of Nintendo; it didn't like the way that Nintendo had a stranglehold on what company produced cartridges for its system and launched a lawsuit against the company alleging that the practice violated American antitrust laws.

Two generations of the Tramiel family have directed the fate of Atari. Sam (left) and his father Jack, all smiles at the Jaguar launch

By 1986 Atari had designed its first 16bit computer, the ST. Everyone immediately thought that 'ST' stood for Sam Tramiel, but he insists that it's an acronym for Sixteen Thirty-Two, the system's internal architecture. The first machine featured 256K of RAM, an external 3.5" drive and a brand-new 'desktop' navigated using a mouse. It was released about a year before the Commodore Amiga, the machine that proved to be the ST's bitter rival. The irony was that Atari invested startup capital in the Amiga when it was still a pipe dream, but when it was offered the machine it turned it down in favor of its own ST.

"I think that Atari's only real **aspiration** can only be to stay in the game, and though they wouldn't **admit it,** even the management knows that. If [it] could earn a half decent market share the Tramiel family would be dancing a **jig** come Christmas 1995"

Stuart Dinsey, *Computer Trade Weekly*

"That's **true** up to a point, in that our immediate **ambition** is to be seen to be part of the game. But we eventually aim to be number **two or three"**

Bob Gleadow Vice President Atari Europe

Lots of publishers released products for the ST initially. Atari authorized conversions of its popular arcade games, and with titles like *Sprint* and *Gauntlet* behind it, sales were buoyant. At this stage, Atari must have figured that the Amiga would never touch it. Although it was technically superior, it was much more expensive and was being marketed as a business machine. In 1989, Atari launched the 520 ST, with an internal 3.5" floppy disk drive, 520K of RAM and a MIDI port. STs walked off the shelves.

By 1989, thanks mainly to the release of the A500 for the home market, the public was becoming aware that the Amiga was an exceptionally powerful machine. Games like *Defender Of The Crown* were left running in shops, and consumers were amazed at the sampled sounds. But still the ST kept the lead. Its head start meant that it had the largest range of software, and it still cost less than the Amiga. But by 1990 the remodeled Amiga 500, rather than the ST, was becoming the 'must have' machine.

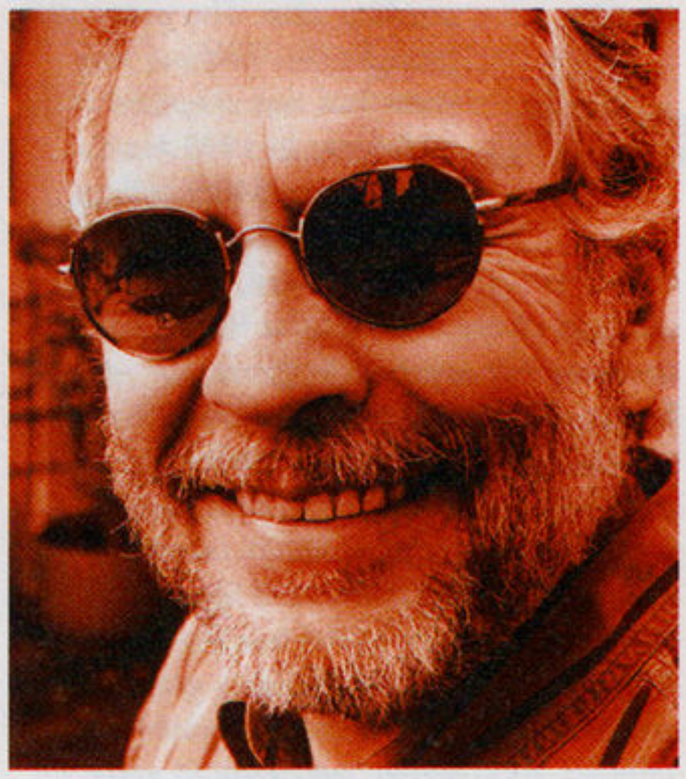
Atari's power base now shifted to Europe, where home computers had become the most popular games medium. Although consoles were strong in the US (the Famicom that Atari *could* have owned became the NES and launched worldwide, while Sega introduced its Master System), the Europeans bought more and more home computers, particularly Atari's ST. In 1990 the British market was split down the middle between the Amiga and the ST — not a single person wanted a console.

In 1991 the Amiga started outselling the ST. The software houses were quick to switch allegiance. Games started appearing on the Amiga first and the ST second. This was despite the release of the STe, an upgraded Atari machine featuring a 4096-color palette. The extra 'e' didn't fool anyone, though: The ST range still couldn't touch the Amiga's technical specifications.

It was in early 1992 that rumors of a new system, the Falcon, emerged. By this time the Amiga was way ahead of the ST range in terms of both software and value for money, so loyal Atari owners hoped that the new machine would give Commodore a bloody nose. It wasn't to be. The Falcon was launched in autumn '92 but wasn't released in any volume until '93. After taking a deep breath, the computer-buying public decided to stick with the Amiga. The Falcon sold, but in relatively paltry numbers and mainly to 'hobbyists.' Meanwhile, the well-oiled Atari rumor factory churned out a singularly unbelievable nugget: there was a 64bit console on the way. That year Atari Corporation posted losses of $76.3 million.

But where the US goes, Europe tends to follow. The 8bit Nintendo and Sega consoles had been doing exceptionally brisk business in the US during the late '80s, and by 1991 the Super Famicom and Master System were big news. The 16bit console market exploded in 1991, and the shock waves reverberated throughout the whole of Europe — Atari's stronghold.

At this point Atari started developing its own console. It had been beaten by Commodore in the home computer market and so it made sense for it to return to a marketplace it knew well. In 1992 the new 16bit consoles went global, turning Nintendo and Sega into fabulously profitable companies with the financial clout to crush anyone who threatened their dominance. Although the Falcon continued to sell in minimal amounts (through specialist computer shops), Atari's handheld Lynx bombed, despite being the most powerful machine on the market.



Nolan Bushnell founded Atari in 1972. The name is the Japanese word for 'check' in the game Go. Bushnell is interviewed on page 6

By 1993, the popularity of the ST and Falcon had crumbled almost completely. Atari was now on the ropes. Its machines had zero credibility and it was losing money hand over fist. Things could only get better.

Atari unveiled the Jaguar in August 1993 at the Chicago Consumer Entertainment Show, to general acclaim. More than 150 developers were sufficiently impressed to sign up for production rights by the end of 1993. Richard Miller, Atari's technical wizard, had invented a brilliant chipset that was capable of chucking polygons around a screen quicker than

"The current **Jaguar** is not powerful enough to **compete** with the new machines. It's **too little too late**"

Tom Kalinske, Sega of America

"I personally think it's **facetious** for them to think that they can even **compete**"

Trip Hawkins, The 3DO Company

"Atari is the best **value** of any **gaming** system"

Sam Tramiel, Atari

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anything else. The press also thought the machine was great, but was skeptical about its future. In 1993 Atari's losses were $48.9 million.

Jeff Minter has always been a fan of Atari hardware. Ever since the days of the Atari 800 he has been churning out psychedelic games full of llamas, sheep, and toilets. In June 1994 he unveiled his *Tempest 2000* Jaguar cartridge, to universal acclaim. This single game probably did more for Atari's reputation than anything the company's marketing team had managed in the last five years. Admittedly, Atari gave Minter a great deal of creative freedom, but the fact remains that *Tempest 2000* forced everyone to start considering Jaguar as a contender.

Whether by accident or design, the Jaguar was released at the perfect moment. During 1994, sales of SNES and Genesis cartridges were falling. The console kids wanted something new, something better, something quicker. Sega released its Genesis add-on, the 32X, and announced the Saturn. Nintendo revealed plans for the Ultra 64 and Sony unveiled the PlayStation project. But the Jaguar was there, in the shops and there were even a few good games available for it. Although the machine sold steadily in the States, it failed to cause a revolution. Atari's position was still precarious.

Then Sega entered the picture. In 1990, in one of the most momentous events in its history, Atari took Sega to court in America for infringement of some of its patents. This was all down to Nolan Bushnell. Bushnell was a very canny businessman who, during the five years he was at the helm of Atari, had paid very good lawyers very good money to patent everything that the hardware and software teams invented, in order to prevent anyone from ripping off any of Atari's innovations (a practice that was continued by Time Warner). When the Tramiels bought Atari, they were obviously more concerned with getting the company running smoothly than pursuing numerous patent infringements, but, sometime in 1988, they decided to unleash the lawyers.

In late 1994, Sega settled out of court for $50 million cash and $40 million stock in Atari. Why did it cave in? Sega ostensibly stepped over the boundary of Atari's nine-pin joystick patent, but this alone wouldn't account for the amount of money involved. Many people in the game industry believe that Atari's patents are so all-encompassing that they effectively give it copyright on a whole range of videogames. It's possible, for example, that Atari owns the concept of sprites that move off the left of the screen and appear on the right — in other words, scrolling backdrops. And this is just one of more than 70 Atari patents, all of which are thought to be quite airtight. So it's no wonder that Sega opted to avoid a potentially disastrous judgment against it and throw in its lot with Atari.

A press release issued by Sega after the negotiations revealed the ramifications of the case: "The two companies have entered into a software license agreement for a specified number of games that would be made available on each company's present and future platforms." So Atari has the option to release Sega games, and vice versa — Jaguar owners should soon see titles like the *Virtua* series and *Daytona* on their machine (but, as Bob Gleadow, vice president of Atari Europe, told **NEXT Generation**, "The line stops at *Sonic*").

And it doesn't end with Sega. Atari is now gunning for other big hardware and software manufacturers — or, as an Atari source put it, "Everyone who can afford to pay us" — and will be looking to companies like Sony and 3DO for compensation. It has already gone the distance with one Japanese giant, so it's not unfeasible that it will do it again. If other companies do settle in the same way as Sega has and invest money in Atari, then by the year 2000 there will be a large number of hardware and software outfits with a vested interest in seeing the Jaguar succeed. Atari had better get its skates on, though, because some of the patents only have another seven years to run.

Atari is fighting hard to regain credibility. It has cast off its lackluster computers and is focusing on the Jaguar, its future looks rosier than it has for some years. It recently announced that its console would be distributed in the heart of the game industry, Japan. It's tied up a VR headset deal; it has a Jaguar CD all-in-one for release in 1995; and work has already started on Jaguar 3 for release in 1996/7.

And, of course, there are those handy patents knocking around. More impressively, there's finally some decent software coming out for the machine. Whether it will be enough to fend off PlayStation and Saturn is doubtful, but Atari always put up a good fight. And people have written them off before — Atari might just surprise us all yet. ng

"We are extremely **pleased** with this relationship which has potential long-term **benefits** for both companies"

David Rosen, Sega Of America

"We at Atari are very **pleased** with this new affiliation. The increased **cash** position will be used to **enhance** our marketing position this fall"

Sam Tramiel, Atari

"We've got **$125 million** cash to spend"

Darryl Still, Atari UK

As Atari plans for a brighter future, **NEXT Generation** talks to its president,

Sam Tramiel

Sam Tramiel, president of Atari: "Focusing much of our energy on the multimedia software that will make Jaguar a success"

NG: Is it fair to say that Atari produces excellent products which suffer a poor public image?

Sam: We do make excellent products. We have made mistakes in the market, and some of the circumstances in the computer market just made it impossible to compete. The Jaguar will get proper marketing support and we and others are working hard to deliver great software. Whatever poor image exists will change.

NG: Atari's shifted its emphasis from computers to consoles. Is this a permanent shift or not?

Sam: Around the end of 1989, Atari decided that the computer hardware business was too cut-throat and a proprietary system could not succeed in the long run against the IBM/Intel juggernaut. We decided to focus on the interactive entertainment market. If the business opportunities exist for us to get back into the computer business, we will. We feel that the Jaguar has a great future and is a very exciting platform at a great price.

NG: But why launch a console now, when everyone else seems to be moving into multimedia hardware?

Sam: The console approach enables us to have a low-price starting platform and gives the user the chance to add peripherals as he or she can afford them. The future peripherals will be a CD player, a voice modem, a VR headset and something else I can't reveal. The other new platforms are just too expensive for the consumer and this has been proven by the failure of Commodore's CDTV and the CD-i players. We are focusing much energy now on the multimedia software that will make Jaguar a success.

NG: Is it true that the Jaguar is a make-or-break product for Atari?

Sam: The Jaguar is not a make-or-break product but it is what we are focusing on. We are also going into the publishing business for PC CD-ROM and perhaps others as well, with another brand name.

NG: Do you think Atari can compete with the giants of the console market, like Sega, Nintendo, 3DO, and Sony?

Sam: Atari invented the videogame business and during the late '70s and early '80s was the dominant company. The industry has been through a number of cycles and we are now entering the fourth cycle. Cycle two was dominated by the NES, cycle three has been shared by Sega and Nintendo and we, at Atari, have put a lot of effort into assuring the success of the Jaguar in cycle four. The Saturn is too expensive and Nintendo doesn't even have a product yet. All Nintendo is doing is trying to confuse the market with disinformation. The 3DO group has doubled the royalty to the software community and the hardware manufacturers aren't happy. The Sony product is just too expensive to be taken seriously and I can't see Sony focusing on a product that won't have the quantities due to the high price. It will not be a big player.

"The Saturn is too expensive and Nintendo doesn't even have a product yet. All Nintendo is doing is trying to confuse the market with disinformation"

NG: But the Jaguar is going to be in direct competition with a lot of heavily backed machines. Does Atari really stand a chance?

Sam: We have some very compelling advantages in terms of power, low price, and lots of good software, with more on the way. We have a very experienced team. We also have the financing. Also important is our strategic investor, Time Warner, and our new partner, Sega, which gives us another source of good software.

NG: How much input does Time Warner have with Atari? Does it provide monetary help beyond its obligations as a large shareholder?

Sam: Time Warner has no official input into Atari, but we do talk to many of the Time Warner divisions and we value our relationship with them. For example, we were chosen to be included in the Time Warner Cable Full Service Network test in Orlando, FL. We got a license from Warner Brothers for the big *Batman Forever* movie. We also work closely with Time Warner Interactive and you'll see it publishing many titles on Jaguar in the near future. We have no need for more money at this time, but if we did have a good reason to raise more, Time Warner could be an option.

NG: Why has it taken Atari so long to pursue patent infringements? Why didn't you go after Sega and Nintendo when you bought Atari from Time Warner?

Sam: The issue of patents is very complex and we pursued the issues as soon as it was prudent to do so.

NG: Are you going to pursue Nintendo, 3DO, Sony, and the other console manufacturers in a similar manner?

Sam: I can only say that we will maximize our patents' value and will pursue whatever means necessary to ensure that they aren't infringed upon. We have some precedents and we look forward to more favorable outcomes.

NG: The Sega deal means that you can release any of its titles (excluding *Sonic*) on the Jaguar. What Sega titles are going to appear on the machine?

Sam: We haven't decided yet.

NG: What steps are you taking to sell Jaguar in the US and Japan?

Sam: We have chosen to make the US the first important market for the Jaguar. It is starting to work. We just introduced the Jaguar into Japan and met more than 60 third party developers in Tokyo. It will not be easy selling a US-made machine in Japan, but we are going to try.

NG: Many industry insiders believed Jack Tramiel imagined revenge on Commodore for the way in which he was ousted from the company. If this is true, is he happy?

Sam: We did not buy Atari as a road to exact revenge on Commodore. It was a good opportunity to acquire the best-known name in videogames.

NG: Is it true that Atari is considering buying its old-time rival, the shattered Commodore company?

Sam: We aren't happy about the demise of Commodore and have no plans to acquire the leftovers.

NG: Finally, what do you think the future holds for Atari?

Sam: Success.

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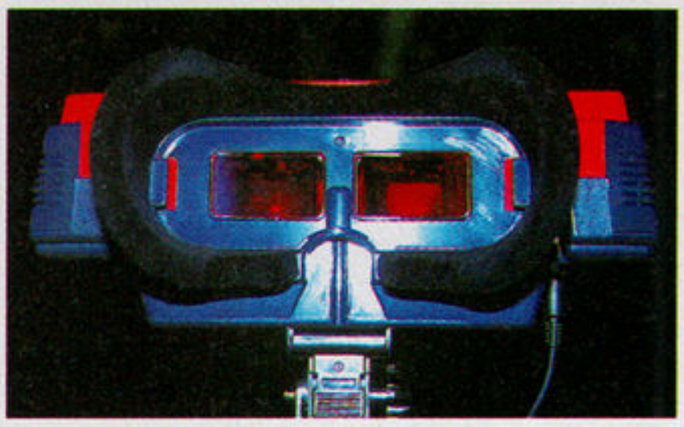

The Virtual Boy's standing mount (top), sans the standard head visor was designed, in part, to keep women's make-up from smearing. An NCL official demonstrated the proper usage of the Virtual Boy to curious in-lookers (above)

"Many people have already said that they can't understand the

An **audience** with...

Gumpei Yokoi

So what's the thinking behind Nintendo's Virtual Boy? **NEXT Generation** talks to Nintendo's hardware guru and the designer of the Game Boy about the latest — and much maligned — addition to his portfolio

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difference between the next-generation machines and the 16bit machines"

In 1969, Gumpei Yokoi was a young electronics graduate looking for a job in his home town of Kyoto. He was taken on by Nintendo as a factory maintenance engineer at the time when the company still specialized in manufacturing Japanese hanafuda playing cards. Soon the Nintendo chairman, Hiroshi Yamauchi, recognized his creative flair — Yokoi was an electronics tinkerer who was forever knocking up gadgets out of spare parts — and moved him into a new division set up to create games and toys.

Yokoi's first project was the Ultra Hand, an extending-arm toy that sold 1.2 million units on its launch in 1970. After several other successful toys, including a baseball pitching machine, a periscope, and even a 'love tester' for teenage couples, Yokoi started to concentrate on electronics. What followed was the phenomenally successful Game And Watch and, several years later, the Game Boy.

NEXT Generation spoke to Gumpei Yokoi at the recent Shoshinkai show in Chiba, Japan, where his most recent creation, the already infamous Virtual Boy, was quietly unveiled to a less than impressed game industry.

For fear of poor quality games being developed, Gumpei Yokoi and Nintendo have been careful of who develops games for the Virtual Boy

NG: Just how important is the Virtual Boy product to Nintendo?

Mr. Yokoi: It really is a very big project, partly because it will be the first product of its type to reach the market and uses very sophisticated technology. We are even telling the Japanese press that we will achieve three million hardware sales in its first year on sale in Japan. At the moment we only have plans for its release in Japan.

NG: Is it Nintendo's next Game Boy?

Mr. Yokoi: Yes, in some ways. But we expect both the Game Boy and Virtual Boy to coexist alongside each other rather than the Virtual Boy being a replacement.

NG: When did the development of the Virtual Boy begin and how many engineers are working on the project?

Mr. Yokoi: There are four R&D groups within Nintendo, and my department (R&D1) has about 60 people working specifically on the Virtual Boy. Before this, we worked on numerous projects including the Game Boy, and also software for the Famicom (NES) and Super Famicom (SNES) such as the *Metroid* series. Other departments — R&D3, for example — are working on the Ultra 64 (under project leader Genyo Takeda, and in cooperation with Silicon Graphics in the US).

Before his creative talents were fully discovered by upper management, young Gumpei Yokoi was originally taken in by Nintendo in the late 60s as a factory maintenance engineer

NG: When was the deal with Reflection Technologies finally tied?

Mr. Yokoi: They approached us about three years ago, but they didn't have any specific end-product in mind. So we hit upon the idea of utilizing two separated screens to make a 3D display.

NG: Did you look at many other forms of technology before deciding on LED?

Mr. Yokoi: Our first decision was to make use of virtual reality-type technology. From there, we thought about many concepts as display apparatus, including LCD devices.

NG: Most people who've seen the Virtual Boy in action are disappointed by its performance. Just how happy is Nintendo with the initial Virtual Boy software lineup?

Mr. Yokoi: I think that the most important point is to show the general public and third-party developers what kind of functions the Virtual Boy has. The initial lineup does that, although it's worth pointing out that it's not yet final.

NG: Some of the early Virtual Boy software looks distinctly 2D. Is it fully realizing the power of the 32bit processor?

Mr. Yokoi: The machine is running two displays simultaneously, obviously with two different images, and they have to be synchronized. That's why we need such a powerful Central Processing Unit — it's effectively doing twice as much work as a conventional videogame system.

NG: How many third-party licensees have you got signed up at this point?

Mr. Yokoi: We haven't been eager to show the technology to many third parties. We've limited it to only a couple up until now, although every developer was shown the product at Shoshinkai, and any interested will be given full product specs and the tools they'll need to develop for it. I believe that there will be a significant number of licensees interested in working on the Virtual Boy.

NG: Why have so few licensees been shown the technology before now?

Mr. Yokoi: This particular strategy was

dictated by Nintendo's president, Hiroshi Yamauchi. The main reason is that if we are going to allow any software publisher to develop games for our platform, there's a danger that poor-quality software will appear. So we wanted to limit that danger and maintain as much control as possible.

NG: Do you have any plans for polygon-based titles or games with other types of 3D environment?

Mr.Yokoi: Yes, polygon-based games are included in our plans, although I can't announce anything just yet. At Nintendo we have been extensively testing polygon software on the system, and third parties will no doubt be using their own techniques to develop polygon games. (It's generally known that Hudson Soft already has a polygon shoot 'em up in development for the Virtual Boy.)

NG: What do you believe, in your opinion, will be the most common type of game to appear on the Virtual Boy?

Mr.Yokoi: Personally, I think that it will be most suited to action and puzzle games, but in the future RPGs and simulations will become popular. (Nintendo loyalist and RPG specialist Square Soft is the only other third party to have been announced.)

NG: What are your plans regarding further software releases?

Mr.Yokoi: Approximately one title per month will be released immediately after the machine's launch, but that will obviously increase as time goes on.

NG: Has Mr. Miyamoto been involved in any software development?

Mr.Yokoi: Not at this stage, no.

NG: Is Nintendo worried about the potential physical dangers of true virtual reality, using head-mounted displays? Wasn't the Virtual Boy originally going to use a head-mounted display...

Mr.Yokoi: No, we didn't think that a head-mounted display would be necessary for a virtual reality system that doesn't use any kind of motion tracking facility. We are worried about the possible dangers of HMD technology, but we also considered the fact that if a woman wearing make-up was to use the head-mounted design, the next person might be hesitant in wearing it! So we changed the design so that you can just look into the viewing apparatus and still appreciate the 3D experience. The standard format was shown at the Shoshinkai show, but we have plans for a shoulder-mount adapter so you won't need a table or desktop to use the system.

NG: And this attachment will appear bundled with the machine...

Mr.Yokoi: No, it will be bought separately.

NG: So what will buyers receive with the system when it goes on sale?

Mr.Yokoi: The stand, the main unit, the controller and the battery box that will be slotted into the controller.

NG: The demonstration machines at the Shoshinkai show were running from AC adapters. Will that be the machine's primary power source?

Mr.Yokoi: No, it's a battery-operated machine. It uses six AA batteries which last for around seven hours. An AC adapter will go on sale separately at the same time as the system.

NG: Since the Virtual Boy uses cartridges, what size will most of the games be?

Mr.Yokoi: Eight Mbits will be the initial standard for most games, although 16 Mbit and 24 Mbit titles are feasible and will most likely appear at a later date.

NG: Is there anything else you can reveal to us about the hardware?

Mr.Yokoi: Sorry, I'm not in a position to give you details at the moment — only third party publishers that are currently signed up have that information.

NG: Are you currently doing any kind of work on other hardware projects at Nintendo — such as development for the Ultra 64, for example?

Mr.Yokoi: At this stage I'm only working on Virtual Boy. We (R&D1) aren't involved with the development of the Ultra 64 hardware — that's being handled in the US by Silicon Graphics and also R&D3.

NG: Isn't Nintendo worried about the arrival of Sega and Sony in the market with what could be very successful machines? How do you feel about the Ultra 64 arriving almost a year later?

Mr.Yokoi: When we initially started work on the Virtual Boy, it was at a time when the Super Famicom was really booming. But we still had doubts as to how long it would take before the general public would eventually get bored with a traditional display. So we came up with the idea of a 3D image project.

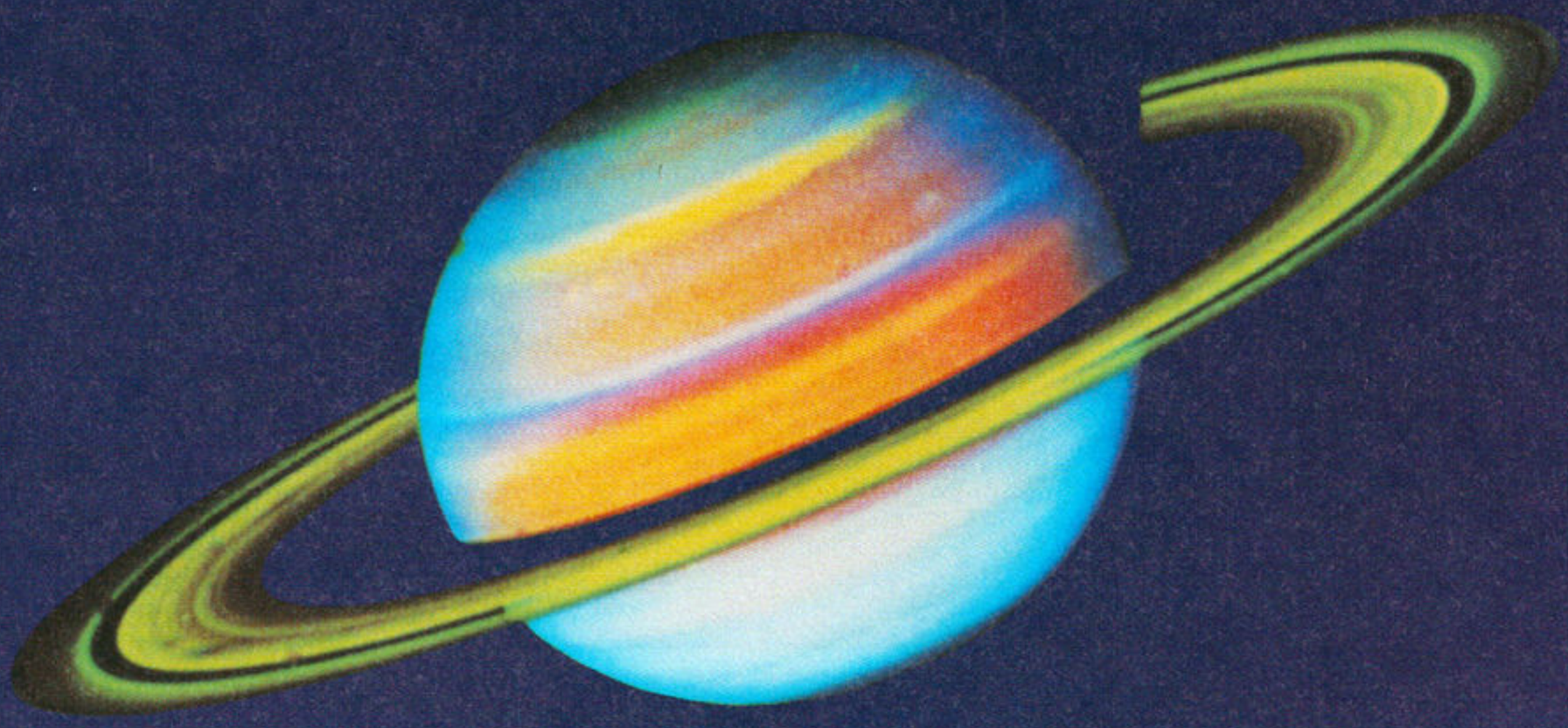
Now we are showing a product that coincides with the release of the PlayStation and Saturn. And I think that what we originally thought was right, because many people who have seen the demonstrations of these so-called next-generation machines have already said that they just can't understand what the difference is between them and the 16bit machines. Therefore, I think that the Virtual Boy will prove very important in this respect. ng

The Virtual Boy will be released in the US 'this summer' for $200. Three games are planned for availability at launch.

Develop games on Saturn.

(Spaceship not included)

To launch games developers into the new age of entertainment, Cross Products is proud to announce that SNASM2 Saturn development systems are now available. Check out the features below and then give us a call so you can join us in running rings around the competition. With prices starting at £3,000 + VAT SNASM2 Saturn development systems offer the following:



- A complete system: you get the Saturn, the interface hardware and the software tools, so you just need a PC and a programmer and you're in business.
- The interface hardware we supply forms part of an open inter-face standard, so it supports other tools such as sound editors and artwork designers which are already available from Sega and third parties, with many more products planned for the future.

- The interface hardware has its own RISC processors to avoid burdening the processors you're trying to program with debugging tasks, and it uses a high-speed SCSI-2 interface so you get ultra-fast downloads and slick debugging.
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- The interface firmware is in flash memory so that any updates that may be required can be quickly and easily perfomed on-site without needing to return systems for upgrade.
- Programmers don't want to worry about adding code to allow the debugger to work (or to worry about remembering to remove it for production!) so our hardware uses NMIs to the processors in the Saturn so you remain in control without extensive code changes.
- The system includes assemblers for SH2 and 68000 processors, a powerful multi-processor linker, GNU C compiler so you can work in any mixture of C or assembly language with full source-level debugging facilities being provided by our advanced SNASM2 remote debugger.
- Can be used with a Programmer's Small Box, or we can supply a production Saturn which is modified to allow it to be used with a CD emulator such as the Sega recommended V-CD (which we can also supply!).
- Our debugging systems have been designed to work alongside the Saturn CD BIOS so you get full access to the CD features without having to jump through hoops.
- With SNASM2 you get backup of a company which has been supplying and supporting games developers for over five years. Dedicated support personnel and a large team of hardware engineers and programmers are continuously enhancing our products to make developers more productive.

SNASM Systems also available for Genesis, Mega CD, 32X, SNES, Jaguar and CD-i

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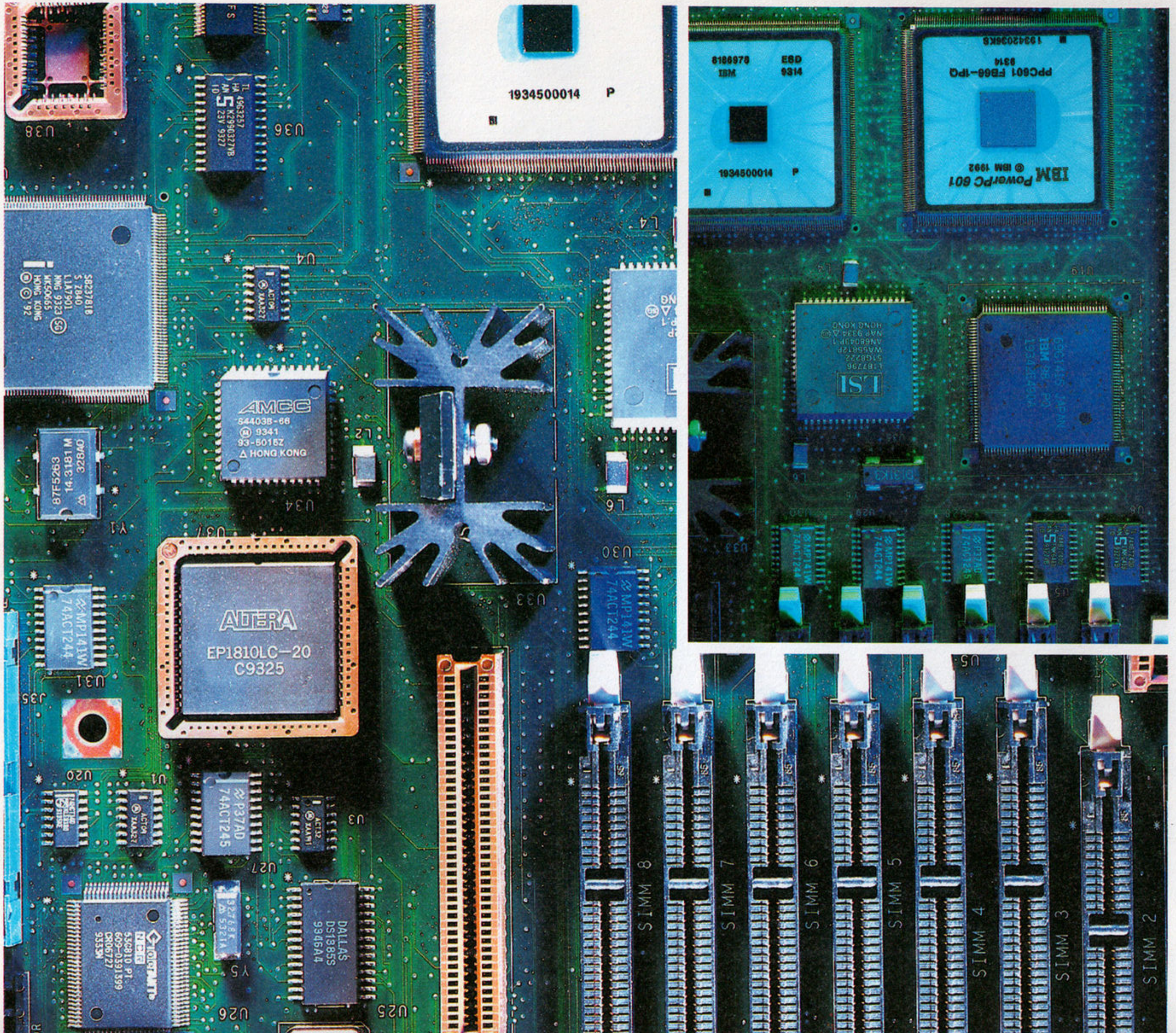
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What's wrong with the PC

part two

The PC game scene is booming almost despite itself. But there's light at the end of the tunnel; a vox pop of expert developers still believe in the PC as a game machine, and the PC's future has rarely looked more hopeful

Despite its traditional image as the machine of business, the PC has now become a truly universal tool. During the past few years it has broken out of the office to become the computer of choice for millions of home users. There are now pure leisure PCs which can run movies, show TV programs, play hi-fi quality audio, support virtual reality and link to every major network in the world.

roland kippenham

Company: Electronic Arts
Job Title: Producer
Projects: *Noctropolis, Sherlock Holmes, Starflight II*

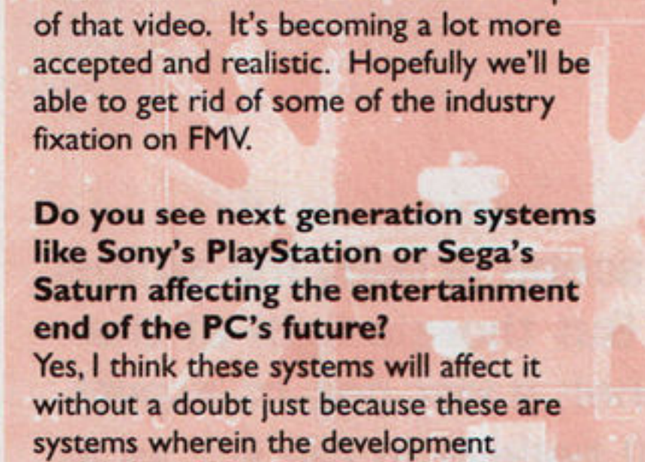
ELECTRONIC ARTS®

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
It's frustrating working on the PC because of the number of different configurations, and trying to get it to work for as many people as possible.

Are those problems becoming better or getting worse?
I don't know, at this point it seems that it's remaining about consistent. I don't think there's any progress being made there.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
I think that it will be larger and the reason for that is because the production values now are becoming much higher, and the use of film and video is becoming prevalent. This requires a much larger staff; as an industry I think we'll be larger, and they'll be more money spent, etc. But in the long run, I think 3D art will be able to take the place of that video. It's becoming a lot more accepted and realistic. Hopefully we'll be able to get rid of some of the industry fixation on FMV.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
Yes, I think these systems will affect it without a doubt just because these are systems wherein the development environment is quite good. Projects can be developed much easier on the Sony, for instance, than they can on the PC. So, I see some game crossover, but I think the PC will survive as a system of its own.



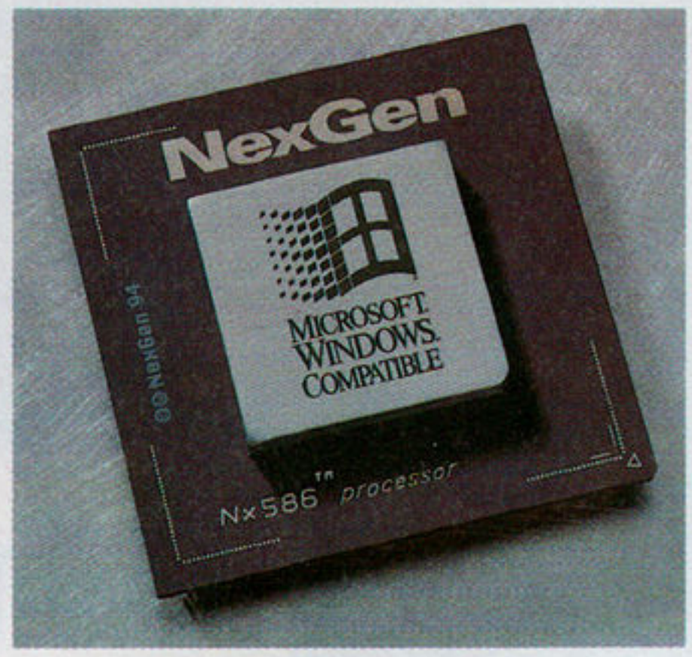
EA's *Noctropolis* brought an entirely new feel to graphic adventures by filling the game with decidedly adult situations

But this is only the beginning of a process that is set to transform the PC by the millennium. The machine continues to evolve and by the end of the century it could well have changed beyond recognition.

The principal catalyst in the evolution of the PC is its CPU. The original IBM PC XT, introduced in 1981, was based on an Intel 8088 chip which ran at a clock rate of 4.77MHz, a tiny fraction of the typical speeds seen today. Now 100MHz PCs are becoming available, with 120MHz and 150MHz machines due in the next few months. Performance increases aren't tied directly to clock rate, however, as the 8bit data bus of the 8088 has also increased, to 16 bits and then 32 bits, and the internal processing has changed from 16 bits to the 64 bits of the Pentium chip.

A commonly used index of processor performance is the Landmark benchmark, which displays the throughput of a chip as the notional clock rate of an equivalent 80286 processor. The 80286 was the second in Intel's family of processors and was introduced in IBM's PC Advanced Technology (AT) machine in 1983, running at 6MHz. Current 90MHz Pentium machines produce landmark indexes of around 520. In other words, they're running like 520MHz IBM PC ATs! So a current Pentium machine is around 85 times faster than a 6MHz PC AT, after about 14 years of development.

Although the Pentium is regarded as the apogee of PC CPU technology, Intel isn't the only chipmaker contributing to the PC's development. There are two main providers of rival processors to Intel: Cyrix and AMD. Both of these companies have grown up providing clones of Intel chips,



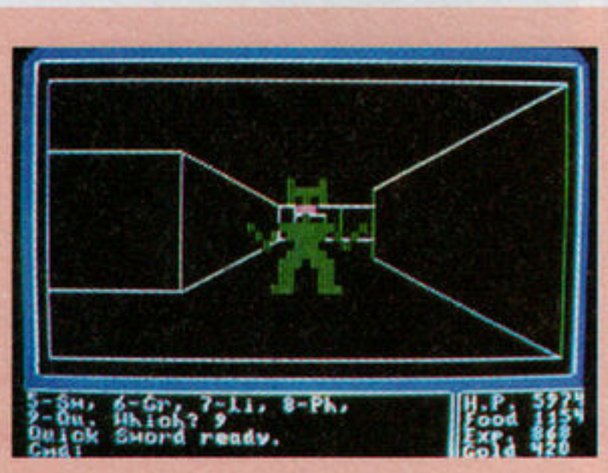
The NextGen Nx586 is one of the first of a new breed of RISC-based processors which can run Intel 80x86 code

either slightly faster or slightly cheaper. But both have broken away from adherence to the Intel standard with fresh designs for their latest processors. The K5 from AMD and the M1 from Cyrix are designed from the ground up to be code-compatible yet not copies of Intel designs. Cyrix claims that its M1 architecture is quite different from Intel's Pentium and should provide increased performance at a lower price. AMD's K5 chip has a different design again, but in turn claims similar performance improvements to the M1. So far, though, all this is on paper, as neither chip is currently available and the predicted performances are derived mainly from paper calculations or simulations.

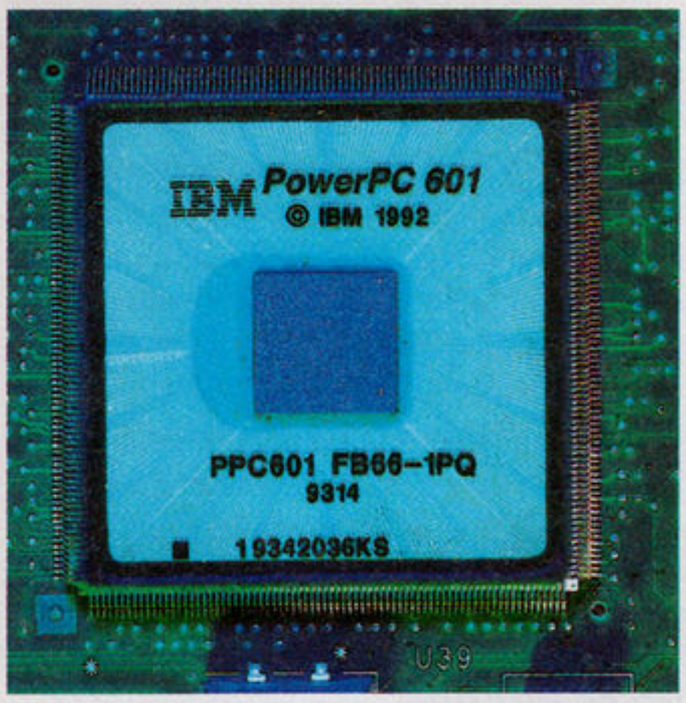
This break with Intel is not only a good way of avoiding its aggressive litigation, but it also leaves both companies free to incorporate RISC structures into their own chips. Despite the redesigns and extra efficiencies built into new Intel 486

The games

Game: **Ultima**
Release Date: **June 1980**
Developer: **Origin**
Minimum processor: **386SX-16**
Minimum video card RAM: **256K**



Ultima was one of the first seriously playable games for the PC, even though the four-color vector graphics leave a lot to be desired by today's standards. The game was supplied on a single 5 1/4" disk and its minimum system requirements were undemanding: CGA graphics, DOS 2.1 or higher, and a total of 256K RAM. Once upon a time, memory was so easy to allocate.



Despite being faster than the Pentium, the PowerPC RISC chip has failed to have any major impact on the PC market so far

and Pentium chips and the advantages they may have, they are essentially more complicated than previous chips. They use complex instruction sets — the really base-level operations that every chip has to obey to run programs from games to spreadsheets. Complex Instruction Set Computers (CISCs) use more transistors than the more recent Reduced Instruction Set (RISC) designs, and for the same equivalent performance. The Pentium is Intel's most complex CISC design yet, with 3.1 million transistors compared to the 2.8 million of a RISC chip like the PowerPC 601. There is still room for further development of CISC chips and the potential for further clock rate increases — 120MHz and 150MHz Pentiums are already planned — but RISC technology is rapidly gaining in popularity.

CISCs take more power and tend to be harder to produce than RISCs, but the complex commands in application programs must be broken down further in RISC machines, so there's a performance trade-off. And RISC designs need more cache to run efficiently, which keeps the transistor count up. However, most people agree that the way to continue increasing processor power without building overly complex chips that are too hot to use is to build RISC designs. Even Intel is said to be incorporating RISC elements into its forthcoming P6 follow-up to its Pentium. Both architectures will be seen in PC design in the next couple of years and will open up the range of devices capable of running PC software.

NextGen, another company building Intel-compatible processors, has already incorporated RISC elements into its new Nx586 Pentium-class processor. The Nx586 runs at 84MHz but provides performance equivalent to a 90MHz Pentium. Peripherals, like videocards, soundcards, drives and memory, are the same as in a conventional PC; only the system board is different. There aren't huge advantages in either performance or price yet — a typical machine is around $165 cheaper — but that's partly because NextGen is still tiny compared to Intel. With increasing economies of scale, RISC-based PCs should become cheaper. If effective 80x86 emulation can be shown to work, a variety of new processors may challenge the top-heavy Pentium architecture. Although RISC is not the savior of computing that it once seemed, more companies are becoming interested in the technology.

Arguably the main threat to Intel's present hegemony is the PowerPC RISC chip from the Motorola, IBM, and Apple conglomerate. The original concept was that the RISC architecture would give machines built around it such a heavy-duty performance boost that they would be able to run both the Apple operating system (used in Macs) and MS-DOS under software and, eventually, hardware emulation.

A current 90MHz Pentium machine is around 85 times faster than a 16MHz IBM PC AT, after about 14 years of development

The Power Macintosh has sold strongly since its launch in spring 1994, and although there are some compatibility problems with nonnative Mac applications, PowerPC-specific versions provide a solution. But MS-DOS emulation, which relies on a program called *SoftPC*, still only runs *Windows* in Real Mode, which has been abandoned on the most current PCs.

However, there are new PowerPC processors well into development that will have the power to run these systems, as well as IBM's own Operating System 2. The PowerPC 604 is a high-

peter mollynieux

Company: Bullfrog
Job Title: Managing Director
Projects: *Populous, Powermonger, Populous II, Syndicate, Theme Park, Magic Carpet*

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
It's got to be the configuration problems without as doubt. There's a lot of video cards out there that have got some really great features on them. When I used to work on the Amiga or [Atari] ST there were tons of video tricks that you could use, but you can't do that on the PC. The audio cards are the same. On the Amiga you could really run the sound because you could get to know the chipset, and really do some great things, but when you're dealing with several different boards, and those boards are changing all of the time, it becomes impossible to ever really have the time to get familiar with the technology.

Are those problems becoming better or getting worse?
An interesting question. In some ways they're getting better, because the video cards are getting faster and the sound cards are getting better, but in another way it's getting worse, because there's even more variations now; and you still have to fight for the 8bit machines. If the PC were released today, with no standards, and its free-form setup, everyone would laugh, but it's the same freedom that makes it so desirable to develop for. Whatever you want to do on the PC you can do. If you want to support something you can, if you don't, you don't have to. In a sense, it's a standard that has created itself.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
It'll be bigger. I don't think there's any doubt. Especially in Europe where the other machines are dying off — the PC is the only one really left.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
Obviously these systems are going to have some impact. But there are some impressive things, like the Glint chip, coming out for the PC that are easily as powerful as the new systems. The new systems also don't have the keyboard which holds them back significantly.

Innovation is the key to Bullfrog's incredible success

ng hardware

r. scott russo

Company: Virgin Interactive entertainment
Job Title: Executive Producer
Projects: *Eleventh Hour, Creature Shock, Ectosphere*

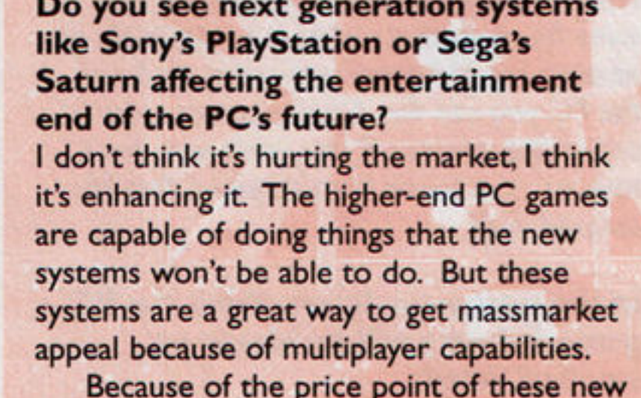
As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
It's a moving target, the platform is constantly changing. There are no standards and it's a very volatile platform. Basically when you're making a PC product, especially a CD-ROM product, you're looking at a 12- to 24-month development cycle. So when you do a leading edge title, you've got to assume that the platform is going to change while you're developing.

Are those problems becoming better or getting worse?
They've been somewhat stable with the 486, but obviously with the Pentium things are going to change. When you're dealing with a traditional platform like Nintendo or Sega, it's basically plug and play for testing.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
It's going to be a lot bigger because of the end of the 16bit platform. Everyone — at least the successful developer — is looking at the PC as a supplemental platform until there's an obvious leader for the newest systems.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
I don't think it's hurting the market, I think it's enhancing it. The higher-end PC games are capable of doing things that the new systems won't be able to do. But these systems are a great way to get massmarket appeal because of multiplayer capabilities.

Because of the price point of these new machines, a lot more people will be able to purchase them, and by buying a dedicated game machine they'll be introduced to the multimedia game experience. As they become more dedicated gamers, I think they'll eventually want to move to the PC, which is capable of much more, and as the new 3D video cards come out it will become even more powerful.



Although release has been delayed, *11th Hour* promises to be a huge hit

performance processor running at 100MHz, as fast as any current chip from Intel. The 64bit PowerPC 620 will go further than that, with a core speed of 133MHz. It's the software development that's holding the hardware back at the moment, but we could still see RISC-based PCs capable of running a number of leading operating systems — and OS/2.

Increasingly, software drives the PC industry. Software demands more and more of the hardware and drives processors to higher speeds and machines to higher memory configurations. Although the huge range of software keeping the PC so popular is still geared to Intel's 80x86 processors, it looks increasingly likely that software or firmware emulation of this code will enable the same software to run on a variety of processor types. This will release the PC industry from Intel's hold and enable new designs, like RISC architectures, to be used in PCs for the first time.

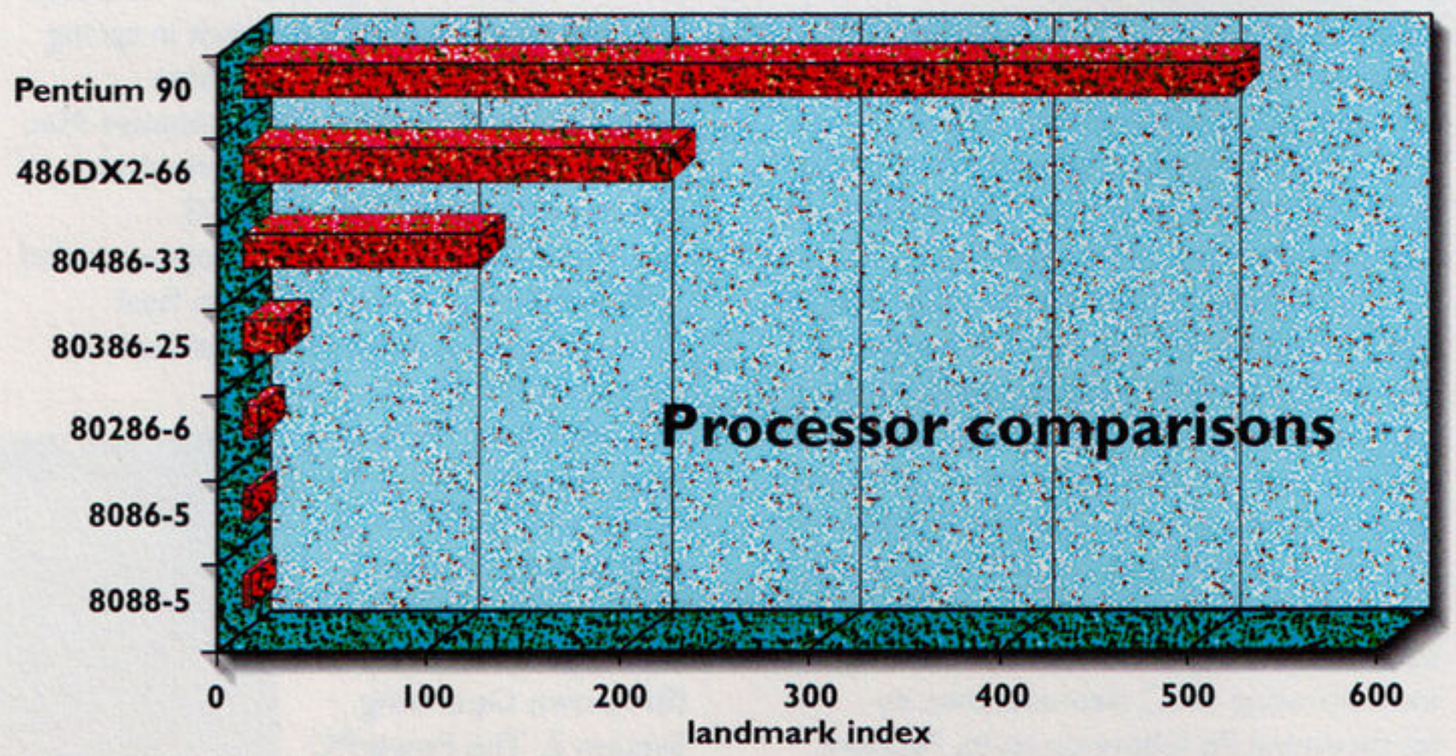
One of the biggest advances likely to happen to the PC is *Windows 95*, the new version of Microsoft's leading operating system. The PC's main criticism has always been its user-hostile interface, with a hieroglyphic prompt against which you have to type semimeaningless abbreviations to get the machine to do anything helpful. The release of *Windows* was the beginning of the end of this trifle and the new version, *Windows 95*, promises to take the machine even further into the uncharted territory of friendly computing.

Although the changes to the *Windows* interface are a great improvement, the most revolutionary aspect of the program is the way it changes the machine's memory map. *Windows 95* will be a fully protected-mode operating system which means that programs written specifically for it will no longer be restricted to a standard main memory block of 640K. If you have an 8 MB machine, then that 8 MB — or what remains of it once the operating system has taken its chunk — is available in one block. There should be no more struggling to fit powerful programs into 640K and no more fiddling around with EMS memory managers.

Although this is also true of current *Windows* programs, most of these are serious applications. *Windows 95* will make available a much wider set of services to leisure and game programs, too. The use of *Win-G*, the game extension which is to be built into the new product, will allow many more games to run directly under *Windows* without the need to slip back to MS-DOS and run their own protected-mode operating system.

Being able to write games that work with a common *Windows* interface will ease the compatibility problems which have plagued the PC. The PC has always been strong on standards. Unfortunately, it likes as many of them as possible. Although some things are improving, there are new proposals virtually every month. *Windows* itself is imposing design standards simply by its weight in numbers. There are few people who not design software obeying *Windows* conventions these days, and these few will grow fewer.

Creative Labs has established a sound standard — SoundBlaster — which even



If you were a mathematician, you might say that this chart was a good example of an exponential growth rate. If you were Intel, you definitely would

The games

Game: **Doom**
Release Date: **November 1993**
Developer: **Id Software**
Minimum processor: **386SX**
Minimum videocard RAM: **1MB**

The most talked about PC game ever — and with good reason. Running on a 486 machine (essential for maximum effect), *Doom* took PC graphics to a totally new level of speed, detail, and realism, and provided a genuinely scary degree of immersion in the gameworld. *Wolfenstein* became obsolete overnight, strategy addicts (for a while, at least) deserted their favorites, and only the most pedantic nitpicked about the fact that it was still not true 3D.

Microsoft will be taking onboard with the release of *Windows 95*. The SVGA specification for video modes is also now well accepted. There are still several competing compression techniques for digital video, although the MPEG standard is gaining a lot of ground. The massive storage space afforded by CD-ROM is still restricted by the 640K segment DOS provides for running programs.

One development that will certainly make future PCs much easier to use is Plug 'n' Play. This is a standard designed to make setting up PC peripherals much easier. If everything works as planned you should be able to insert a Plug 'n' Play card into a Plug 'n' Play PC and expect it to work. Gone will be the tediously endless trials with interrupts, DMA channels, base addresses, etc, with which PC users have previously had to contend.

A Plug 'n' Play PC will maintain a database of the cards and drives connected to it and their various requirements. It will be able to communicate with any new card and negotiate for interrupts, channels, and addresses so that they don't clash with the requirements of any other device. Even existing cards will be able to take part, as long as their details are on the Plug 'n' Play database. Installation won't be automatic but it will still be a lot easier than it is now. Removing a card, perhaps for upgrading, will be automatically noticed by the Plug 'n' Play system and the interrupts made available to other devices.

The PC has always been strong on standards — it likes as many of them as possible

To keep pace with continuing developments in processors, we need chips with more and more memory. Already, 4 MB memory modules (SIMMs) are becoming more common than 1 MB modules, with 8 MB and 16 MB units also starting to come into the scene. While currently extremely expensive, 64 MB SIMMs have been announced. In fact, memory has not decreased in price by nearly as much as processors in the last three years. One MB of memory is still about $50 and the discount for buying 4 MB or 8 MB SIMMs is small.

This may change if Intel's research into flash technology proves fruitful. The company believes it has a way of storing several bits of information in the same flash memory cell. It does this by persuading the cell not just to be switched on (showing a voltage) or off (showing no voltage), but to hold a number of different voltages to represent one, two, three or four bits. If each memory cell can be made to hold several bits, the number of cells you need for a given memory capacity can be reduced. Intel has talked about amazing prices of 45¢ a megabyte and machines with up to 1 Gigabyte of main memory.

This kind of cheap extra memory will remove one of the problems facing another emerging PC technology: voice recognition.

rusty buchert

Company: Interplay
Job Title: Producer
Projects: *Star Trek: Judgment Rites*, *Descent*, *Buzz Aldrin's Race Into Space*

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
The biggest concern is making it work on a reasonable machine. We've all become so tied up making the games look good that a lot of times the average Joe, who's trying to run the software on a 386, is forgotten. Everyone's writing games that need this huge Pentium 90 to run like they should.

Are those problems becoming better or getting worse?
As an industry trend, I think it's getting worse, but enough new machines are coming out at a reasonable price now that it's getting easier for people to buy a high-end processor. But as soon as a new chip comes out, everyone will run out and start writing games for that, meanwhile everyone at home gets left in the dust.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
I see a growth. In the next 18 months I see a lot of titles coming out. But I also see a return of the Atari 2600 days, where just about everyone in Hollywood is throwing $5 or $6 million dollars into developing titles that could never hope to sell enough to be profitable.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
To a degree, yes, these systems will affect the future. The reason I say that is they're giving people a look at the next things that will be available for the PC. All of the polygons and texture mapping elements are things that are just now becoming available for the PC, and when they hit big, they'll outperform any of the new machines by far. Evolve or die is the saying in the industry, and the PC is not only capable of evolving, it will.

***Judgment Rites* gave *Star Trek* fans another chance to take on the role of their favorite spacefaring heroes**

ng hardware

dan schmidt

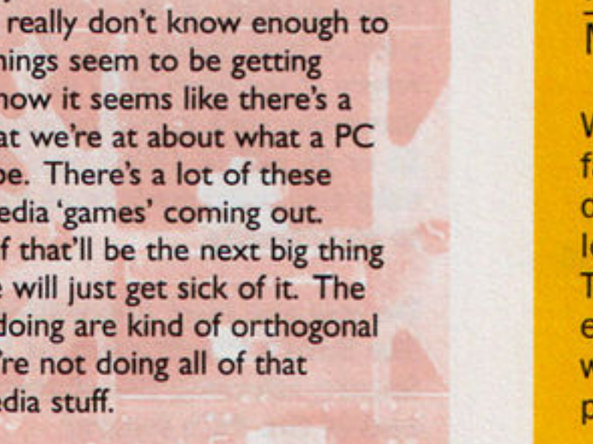
Company: Looking Glass
Job Title: Project Leader/Programmer
Projects: *Ultima Underworld, Ultima Underworld 2, Terra Nova*

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
There are a couple of things. First, if you program for the Sega Genesis, you know exactly what hardware to expect. If you program for the PC, you don't know what kind of hardware to expect. You're trying to write for several platforms at once, and make a game that all of these people can enjoy. It takes a lot of energy to deal with all of the issues... it would be really nice if they all went away.

Are those problems becoming better or getting worse?
In some ways it's getting better, I mean, I think it will always be there for the PC. It seems like a lot of people are trying to get a major machine right now, a Pentium with a CD-ROM, and that's great, but it would be nice if everyone just agreed on one machine. But certainly that's not going to happen anytime soon.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
Hmm... Well, I really don't know enough to tell you, but things seem to be getting bigger. Right now it seems like there's a crossroads that we're at about what a PC game should be. There's a lot of these movie/multimedia 'games' coming out. I don't know if that'll be the next big thing or if everyone will just get sick of it. The game's we're doing are kind of orthogonal to that — we're not doing all of that video/multimedia stuff.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
Yeah, I think they're sort of getting to the point where you can have more sophisticated games on them. It seems that they'll be eating into some of the market that the PC has enjoyed up until now, just because the PC was the only system that could do it. But as long as people have PCs in their homes, there's no doubt, they'll be playing games on them.



***Terra Nova: Strike Force Centauri*'s smooth terrains are representative of Looking Glass' work**

The one aspect of *Star Trek* technology that is certain to appear before the 23rd century is the ability of computers to recognize and and process human verbal commands. Novell (*WordPerfect*), IBM, and a number of other big names are known to be working on voice input for application programs and the first examples are promised this year.

There two levels of voice recognition presently being worked on are: command level and natural language. Command level can recognize, for instance, individual words or phrases spoken discreetly, such as "File, Print, Copies, Two, OK" to print two copies of a document under *Windows*. This is comparatively easy, as the software is only required to match the envelope of the sound to an entry in its database. This kind of control is already available in programs like Creative's program *VoiceAssist*, but the interesting developments will come with natural language recognition.

Early natural language programs should be able to understand the command "Print two copies of the current document," spoken without unnatural gaps between words. As the technology improves, it should be possible to build context recognition into the process, so that a command like "Show the performance results for the Pentium-90 and the NextGen Nx586 in the worksheet 'Tests' and create a new column of their differences" is understood. We're still a long way away from this level of understanding, however it will, no doubt, make a radical difference in the way PCs are used and perceived altogether.

CD-ROM drives are becoming standard on modern PCs, and not just for multimedia machines. The CD-ROM is so cheap to produce, so hard to pirate, and has such a large capacity — relative to floppies — that it is the ideal medium for distributing software. But to abandon boxes full of floppy disks, though, the majority of PCs have to be fitted with CD-ROM drives. This will happen in the next year or two and several other changes to the drives themselves will further establish the technology.

The data transfer rate of a double-speed CD-ROM drive is around a quarter of that of a hard disk, and even lower compared to some of the new enhanced IDE and SCSI disk drives. Quad-speed CD-ROM drives are dropping in price but are still more than $495 a unit. However, new technology is on the way from Pioneer that could transform CD-ROM. Pioneer has found a way of creating a blue-light laser that works at room temperature. The advantage of blue light is that its wavelength is much shorter than today's red beams. With a shorter wavelength, the laser beam has a smaller 'point.' This means that you can read smaller pits in a CD's surface and put more of them on any area of the disc. In fact, Pioneer estimates that it will be able to store three or four times as much digital video — complete feature films on one disc — or up to 10 hours of ultra high-quality sound. It will be a couple of years before this technology is ready, but in the meantime there's high-density CD.

HDCD is set to double the video storage of a single

The games

Game: **Wolfenstein 3D**
Release Date: **June 1992**
Developer: **Id Software**
Minimum processor: **286SX**
Minimum videocard RAM: **512K**

When *Wolfenstein 3D* appeared it was the fastest 3D game ever. Id Software had developed a new engine that enabled even low specced PCs to shift a Nazi castle around at high speed. The game 'cheated' in that it did not manipulate a true 3D environment (looking up and down was not possible) but a full window display was possible and *Wolfenstein* thus took its place in the PC hall of fame.

disc, using a new kind of routine — MPEG 2 — that compresses different frames by different amounts. Depending on the changes that have occurred between the previous and the current frames, a frame may take between 1 Mbit and 8 Mbits, and that's compressing every single line of the picture. This contrasts with the current MPEG 1 convention, which compresses every frame to the same size and uses only every other line.

CD-ROM won't really have arrived until you can record data on them. Until recently, drives that could write a CD-ROM, using a higher-powered laser than is needed to read them, cost well into four figures. This will change because suitable drives are already dropping in price and will cost less than $800 in the US this year. Within a few years they may well be an affordable part of the family multimedia center.

The huge growth in e-mail and network systems is starting to tie various computers into global communities

This kind of CD-ROM storage is only suitable for one-time recordings, when editing isn't necessary. Currently, CD-ROM is a write-once medium and although there are multiwrite optical technologies available, the discs are too expensive for general purpose use.

Another technology which looks promising is the high-density floppy disk proposed by Fuji. Fuji has formulated a microthin magnetic coating for videotapes which allows extremely high data densities. This same coating could be used for floppy disks. With the disks spinning at around 10 times their current speed, both the transfer rate and capacity could be increased. Fuji believes it can make 3.5" floppy disks with a capacity of up to 200 MB.

The only problem is that the company doesn't make floppy disk drives. Although it's quite capable of churning out the disks, it has to persuade some other company that it's a good idea to make drives for them. Assuming it can cross this hurdle, cheap, high-capacity floppies could well be available in bulk within a year.

Increased storage capacity is essential to cope with the huge amount of data generated by virtual reality applications. Virtual reality is not a technology exclusive to the PC, but the strength of the PC's userbase makes it one of the most lucrative markets for affordable VR headsets and body suits. We already have headsets such as the Cybermaxx, which costs less than $825 and uses miniature active matrix LCD screens and wide fields of view. Though there's little software to support the systems so far, the pricing and likely market size should encourage enough companies to keep the titles rolling out. VR gloves and body suits are also in the pipeline, making fully immersive experiences a possibility in the home for the first time.

The miniature VR screens in these headsets could also be used to display TV pictures. With the correct encoding, limited 3D effects could be obtained from standard transmitted signals. The limiting factor at the moment is the resolution of the LCD panels themselves.

Embedded TV pictures are already available on *Windows* screens, using a chipset developed by Philips. The chips take a standard RF signal from any TV aerial and convert it to display on a PC screen, where it can be sized and moved around within a window like any other *Windows* application. It isn't a true digitized picture, though. The signal is still analog — you can grab individual frames and digitize them, but you can't record extracts for realtime playback. With the improvements in MPEG compression techniques, this won't be long in coming, though. High-priced digital TV cards are beginning to dribble out of the US and these will enable digitizing of pictures off-air and digital recording of the results on suitable media.

The huge growth in electronic mail and networking systems, epitomized by the internet, is already starting to tie computers of all persuasions together into global communities. Although these systems are still not intuitive enough for mass use, new interfaces are under development and PCs will be at the forefront of machines making the connections. Internet access is already built into *OS/2 Warp* and *Windows 95*, and Microsoft recently launched its own rival to on-line services such as CompuServe. Microsoft's offering is aimed very much at home users and will definitely appear on an easy-to-use *Windows* interface.

In business, PCs are being used for video conferencing, the kind of

sid meier

Company: Microprose
Job Title: Game Designer
Projects: *Covert Action, Railroad Tycoon, Civilization, Colonization*

MICROPROSE

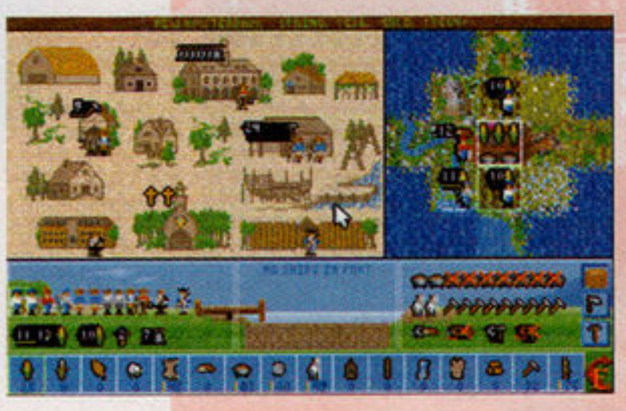
As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
Probably the sound aspect is the most frustrating. There's such a variety of sound cards out in the marketplace now that you can't be guaranteed that the sound you create will come out like you intended. Ten to 12 years ago I was programming for the Atari and Commodore computers, and those machines actually had better sound systems with which to work.

Are those problems becoming better or getting worse?
Well, it's getting a little better. I mean, there are fewer problems. At least it's gotten to the point now where we can assume a user has some form of sound card. The days of the PC speaker are thankfully over.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
I think it's going to be about the same size. I think a PC gameplayer goes to the PC because he or she likes the kind of games that are there, so regardless of what other places are doing, these players are still going to the PC for their games.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
That's a good question. My point of view is that it really depends on the software released for the systems. It will have to play the same kind of games that those PC gamers want to play in order to tempt them away from their machines. One big difference is the keyboard issue; a lot of the PC games either require a keyboard or play better with a keyboard, and that's going to hold back new systems to some degree.

As far as development for new systems goes, we're not looking for a particular piece of technology, we're looking for a particular customer, and if those customers start playing their games on a PlayStation or a Saturn system, then we'll start making games for that system.



***Colonization* was a fantastic follow up to one of the most popular strategy games of all time**

bryan walker

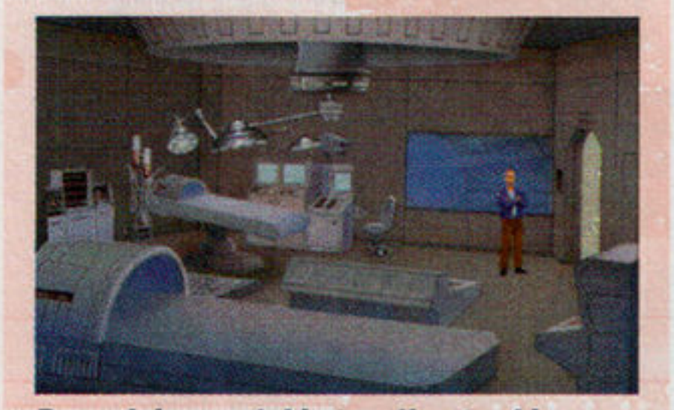
Company: Domark
Job Title: Simulations Producer
Projects: *Flight Sim Toolkit: WWII, Out of the Sun, Flying Nightmares II, Confirmed Kill* (working title)

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
The mind-numbing combinations of sound cards. Video drivers are trouble, too, but definitely worth it. One of the things we do at Domark is to actually write specific drivers for each video card. Our engines are designed to be as modular as possible to make that easier.

Are those problems becoming better or getting worse?
Worse. Too many cards are coming out now claiming Sound Blaster compatibility but are not compatible. Writing specific sound drivers, and ironing out the problems associated with those drivers, makes up about 20% of our development time. But it's this weakness that ends up being one of the PC's greatest strengths; also, it's the competition between various card and chip manufacturers that drives new development and keeps costs so low.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
It will be much bigger. Plummeting prices on the PC and accessories will drive sales up even further. The PC offers so much bang for the buck compared to any other platform that I think it will be the dominant system for years to come.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
No. They just don't offer enough versatility. Basic input devices are inadequate. Features like the storage medium, the game-saving devices, and ease of updates just aren't up to the same par as the PC. The people who spend the most on games aren't the 14 and 15 year olds, it's the 30 year old [consumer] with enough free cash to spend who will be driving sales.



Domark is now taking on the graphic adventure craze with its new saga, *The Orion Conspiracy*

person-to-person, full-motion video calls previously the realm of Captain Scarlet and expensive stand-alone devices. The growing availability of digital ISDN telephone lines will permit cheaper PC-based connections of this type, once the wiring is there to take them. The latest version of *Corel Ventura Publisher*, the high-end DTP program, was codeveloped by programming teams in Canada, England, India, and the US, all working on the same code on a single network.

Soundcards

continue to improve in quality and facilities, with devices such as Creative's AWE 32 now boasting 32bit processors. The more interesting aspect of this card, though, is the wave-table synthesis it uses to reproduce natural sound, including acoustic instruments. Rather than synthesizing the sounds as earlier cards did, the AWE and other modern cards use tables of their waveforms. This produces much more accurate copies of the originals and these can then be used as MIDI voices in conjunction with the new generation of PC-based music software.

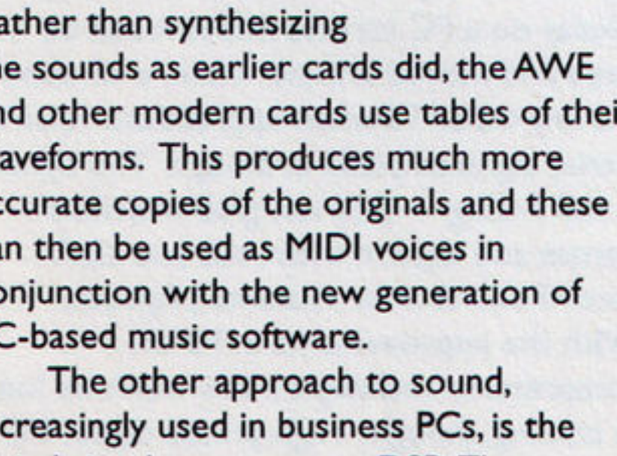
The other approach to sound, increasingly used in business PCs, is the digital signal processor, or DSP. These versatile chips can be reconfigured through software to perform several functions, often at the same time. Typical DSPs can be used as fax/modems, voicemail systems, CD-ROM controllers, and soundcards. This is a very efficient way of working, as the chips take up little room on the system boards or expansions cards within PCs.

The size and shape of a PC is governed by the components it has to contain, and unless they change, this shape is fairly fixed. There have been a number of attempts to make the machine smaller, but this then limits the number of drives and expansion cards one can add. As we know very well now, the PC's flexibility has always been one of the key factors in its vast and growing popularity.

The PC's weight of numbers ensures its success as the mainstream desktop computer for at least the next 10 years

As more and more PCs are sold into homes, there are moves to integrate the monitor and system unit and to build in multimedia speakers and microphones. This makes the setting up easier, too, as there are fewer cables to connect. A more radical solution, yet to be seen but still possible, is to use PC cards already in notebooks, instead of the standard expansion bus. Normal expansion boards are much bigger than the credit-card-sized PCMCIA cards. Imagine a PC with half a dozen PC card slots in its front panel. No need to remove the case to upgrade or to add a new hard drive and there you've got the ability to change the machine's configuration, even when it's powered up. A PC based on PC cards wouldn't need to be much taller than the card itself and, with a separate keyboard, could have a footprint smaller than many notebooks.

The games



Game: **Magic Carpet**
Release Date: **November 1994**
Developer: **Bullfrog**
Minimum processor: **486**
Minimum videocard RAM: **1MB**

The finest graphics on the PC to date belong to *Magic Carpet*. Rather than set off on a futile attempt to copy Id's *Doom* engine, Bullfrog instead persevered with its revolutionary fractal engine technology. The first game to feature a dedicated Pentium mode (SVGA throughout), *Magic Carpet* grants the player complete freedom to explore. Cliffs melt seamlessly into the sea while fireballs explode all around you. This really is something special.

The games

Game: **Ultima Underworld**
Release Date: **June 1992**
Developer: **Origin**
Minimum processor: **386SX-16**
Minimum video card RAM: **256K**

Origin's *Ultima Underworld* pushed the PC's graphics into a new era. Prior to the game, 3D movement was restricted to advancing in monotonous blocks (such as in *Eye Of The Beholder*). *Ultima Underworld* featured a true 3D world which enabled you total freedom to move around. The window was still very small but the game gave PC users unprecedented realistic gameplay. A winner.

The PC is being turned to so many different tasks that it is really becoming a vehicle for advances in many areas of communications and IT. Its sheer weight of numbers ensures its success as the mainstream desktop computer for at least the next 10 years.

Although virtually all elements of the machine will change during that time, the commitment of hardware and software companies to backward compatibility means that the PC is one of the few viable massmarket microcomputers.

So what kind of PCs can we expect to see by the end of the century? Speech recognition will undoubtedly feature heavily in the PC of five years from now. Conversations like, "Computer, record this week's *Melrose Place* over last week's *Star Trek Voyager*, edit out the ad break and close up any subsequent recordings on that disc" are not that far from reality. By the end of the century, or more probably before, it may be second nature. Speech recognition will be built into new versions of major applications like the word processor *WordPerfect* before the end of this year. Although it will be more faltering than the example above, there's a lot of money being poured into natural speech understanding. Part of the problem is processing power. However, the rate of increase in processing power shows no signs of slowing, and a hybrid of existing and new technologies which will ensure that the PC of 2000 is much faster than the machines of today.

The PC is being turned to so many different tasks that it is really becoming a vehicle for advances in many areas of communications and IT

Soon, recording TV or other forms of video on CDs or CD-sized discs will be an easy matter; advanced compression techniques, combined with higher packing densities offered by high frequency lasers, will ease video editing and home recording on disc. Writable CDs will also be cheaply available.

PC 2000 will still have a screen, probably a TrueColor LCD, since there is no other technology on the horizon that is as light and compact. Touch sensitivity may well be included, to augment voice control and the occasional use of a keyboard, where this is more efficient. Transparent connection to an growing variety of internet-like services will simply be automatic, as and when the information searches that we request need to make use of them. The main link will either be a highspeed fiber-optic telephone line or satellite dish.

If you want the result of your work on paper, you'll just print in full color on a desktop printer with a commercial print resolution of 2,000 dpi or higher. Games may well include full VR bodysuits and environments will be photorealistic, with none of the simplistic, blocky effects seen on today's headsets. And finally, the desktop machine is likely to be a lot smaller than the current size of PCs, possibly based on the PCMCIA standard.

And people used to think the PC was boring. ng

eydie laramore

Company: Westwood
Job Title: Lead Designer
Projects: *Eye of the Beholder, Circuit's Edge, Land of Lore, Dune II, Command and Conquer*

Westwood™ STUDIOS

As a developer, what do you find to be the most difficult or frustrating aspect of working on the PC?
The lack of standards is definitely the most aggravating part. EMS, XMS, not to mention audio problems, these have been the crux of it. In the end, the lack of standards either costs us a lot in development time or it costs us a lot of users.

Are those problems becoming better or getting worse?
There are fewer and fewer problems; they're definitely getting better. I think the hardware manufacturers are beginning to realize that they have to do something about the absence of a standard. The problem had to solve itself. We've weathered this storm before.

In the next year, do you think the PC game industry will be bigger or smaller? Why?
The industry will be bigger, definitely bigger. Why, we're looking at the latest wave of *7th Guest*-type products where you're looking at extremely high graphic products, and it's something that puts PC games on a level with movies and entertainment, and we're just scratching the surface. With the new products we're doing, like *Lands Of Lore 2* or *Command and Conquer*, we're offering entertainment that's on a par with any other entertainment out there.

Do you see next generation systems like Sony's PlayStation or Sega's Saturn affecting the entertainment end of the PC's future?
The short of it is no. Traditionally, there's always been a small percentage of overlap between the players of these systems, but we've found that there is a small overlap: PC players are PC players, period.

Adding graphic punch to the often plain strategy genre, *Command and Conquer* is a game that has it all

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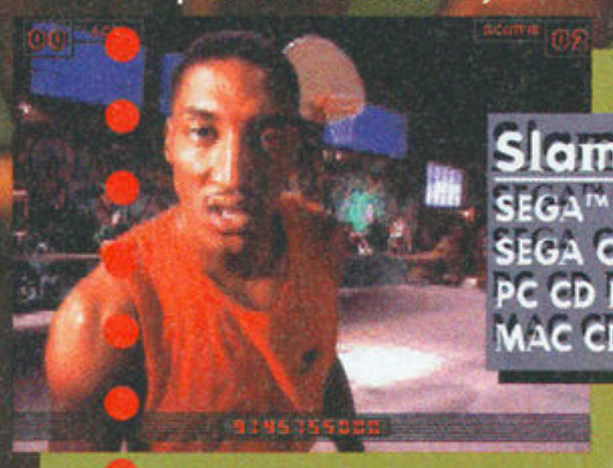

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Flight Unlimited **PC** Terra Nova **PC** Slipstream 5000 **PC** Sega Rally **Arcade** Command & Conquer **PC**
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alphas

Games currently in development around the world

This month's alphas gives you a first glance at the latest games in progress from around the world. In answer to the current buzz on PC development, we've taken a long look at some of the biggest names in production and some of the titles that are on the rise. You'll also want to check out our behind-the-scenes report on Sega's technical wizards and its latest projects for both arcade and home machines. Be sure to take a good look at our finals on page 86 for a copious number of reviews of finished games.

Flight Unlimited (above) and *Terra Nova* (bottom) — the two games that Looking Glass hopes will propel it to fame and fortune this year

Looking Glass

One of the rising stars of the software industry is about to go supernova with a band of games promising seductive graphics and innovative gameplay

Startlingly realistic landscapes fill every view

Looking Glass Technology is about to come into its own. From its offices in Cambridge, Massachussets, it has turned out some of the most impressive and entertaining software ever produced for the PC — for other organizations. But now it is starting to expand with a couple of brand-new projects in which it has dominated all stages of production from initial concept right through to finished game. **NEXT Generation** paid a visit to this thoroughly modern firm and saw how its vision of game design is going to shape the future.

Chances are you've already played a Looking Glass game. The firm was founded in 1992 by Paul Neurath and Edward Lerner following a merger between Blue Sky Productions and Lerner Research, and now employs over 40 developers, programmers, artists and musicians. It has come to be regarded as a center of excellence in 3D graphics, with production credits including *Chuck*

ng alphas

You'd be forgiven for thinking that these shots are prerendered. Instead, Looking Glass has digitized actual aerial photographs, added contours and accurately modeled the air thermals according to the topography

Yeager's Advanced Flight Trainer, F-22 Interceptor, John Madden Football '93, Links Pro and *Car And Driver*. Looking Glass also produced several highly regarded projects in association with Origin. The revolutionary 3D engine employed in *Ultima Underworld*, enhanced for *Ultima Underworld 2* and refined still further for *System Shock*, was largely the achievement of Looking Glass. The company may not be a household name just yet, but with a back catalog like that it's well on the way.

The corporate ethos of Looking Glass is both ambitious and forward thinking. The firm feels that it is on the cutting edge of game design and strives to push back further frontiers, through the appliance of technology. Both of its new projects, *Flight Unlimited* and *Terra Nova: Strike Force Centauri*, share incredible attention to physical detail, on which self-proclaimed 'mad scientist' Seamus Blackley, project leader on *Flight Unlimited*, places great importance. "We're working on getting the maths right," he says with a smile. "Everything follows on from that."

Looking Glass' first project, *Flight Unlimited*, is no ordinary flight simulator. The company has thrown traditional flight sim design out of the cabin window and replaced it with an entirely new system for air modeling. On top of that it has added visual effects and a level of playability that most designers could only dream of.

Since the birth of the flight simulator, one aspect has linked almost every stab at the genre: the method used to calculate airplane movement. Commercial flight simulators are designed to train pilots to fly under strictly controlled operating conditions and therefore the pilot's actions are likely to be predictable. If that's the case, then all you need to do is play back airplane movement

Seamus Blackley is the perfect project leader for *Flight Unlimited*. How many computer buffs do you know who are also maths geniuses and qualified pilots?

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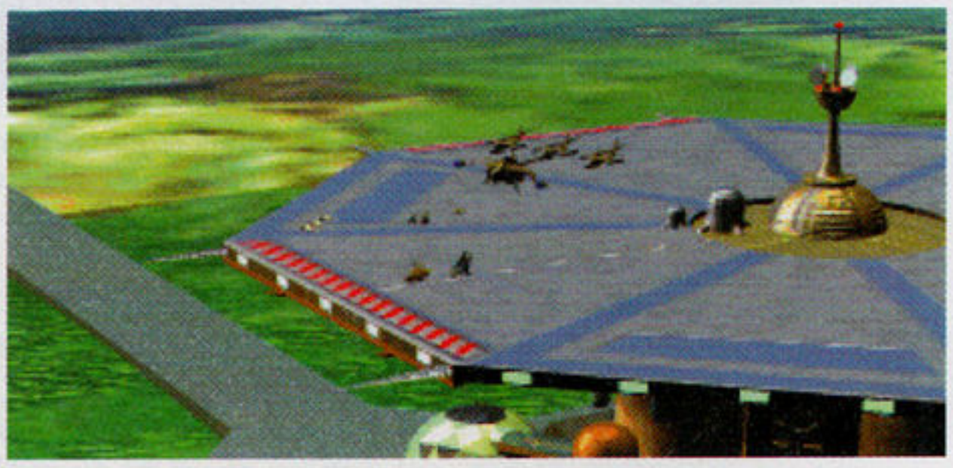
directly related to specific control movements. For example, the program knows how much movement would be caused by a standard left rudder movement, so it checks a data table and shifts the airplane's position according to what happened when a real pilot did the same thing in a real plane and engineers monitored it. These tables of prerecorded flight data are called 'derivatives.'

Rather than using these data sets, *Flight Unlimited* recognizes that what you actually want to do when you play a flight sim is fool around and pull outrageous maneuvers which would lose you your commercial license in the real world. No data set could possibly predict this kind of random, irresponsible behavior. What theoretical physicist Blackley has done instead is model the movement of air across the terrain and then see how that air would effect the changing shape of your airplane (it changes every time you move a control surface). In addition to creating a fully aerobatic simulator, this also gives *Flight Unlimited* a tremendously fluid feel, something rarely captured in other sims.

When this is combined with photorealistic ground detailing — actually based on aerial photographs — plus active terrain added from contour maps, and wonderfully drawn planes, then you're in for a seriously rich and tasty visual feast.

The sound is coming along well too. Eager sound engineers took to



The little-used but fluid Voxel Space system (as seen in *Comanche*) has been enhanced in *Terra Nova: Strike Force Centauri*, with texture mapping used to limit its inherent blockiness at close range. The game's split-screen approach (top left) lets you shoot while giving orders to your squad

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The motion platform (top) uses pneumatic air from a compressor (above) to chuck would-be pilots around. It's still at the prototype stage

Looking Glass claims that *Flight Unlimited* is particularly suited to VR helmets. Seeing the horizon flip repeatedly as your plane goes into a barrel roll will induce a similar movement in your stomach

the skies with aerobatic pilots and recorded the engine noises as they were treated to the kind of stunts the game encourages you to pull.

When you tire of oggling at the scenery and whooshing around the skies, *Flight Unlimited* also offers a full in-flight instructor which trains you in classic maneuvers and then judges you on real-life aerobatic performance criteria.

When you're ready, you can also have a bash at the hoop game, a challenge which has you flying through static loops in the sky and brings more than a whiff of the SNES classic *Pilotwings* to the proceedings. At last, gameplayers could have access to a realistic flight sim with that all too rare element of fun.

The second product in the pipeline for 1995 has only recently been given a name: *Terra Nova: Strike Force Centauri*. **NEXT Generation** visited the offices the day after that moniker had been decided and most employees were still running around calling it by its previous working title, *Free Fall*.

The game is a first-person-perspective combat/strategy affair with a science fiction plot. If you had to compare it to something currently available, it would have to be a cross between *Magic Carpet* and *UFO: Enemy Unknown*. Players lead teams of soldiers across various planet surfaces, dropping down in powered battle armor suits to fulfill around 30 missions, including attack, defense, reconnaissance and recovery.

Producer Dan Schmidt was keen to show off the artificial intelligence in the game. Before missions you get to hobnob with various people around the base, interacting with squad mates, learning about their specialties and seeing how they're likely to perform on missions. You can only take three copilots on each assignment and your choice of traveling companions has as much bearing on your chances of survival as the calluses on your joypad hand. Team members are autonomous enough to get on with the missions with a minimum of direction, and the quality of the AI means that they

Dan Schmidt, project leader on *Terra Nova*

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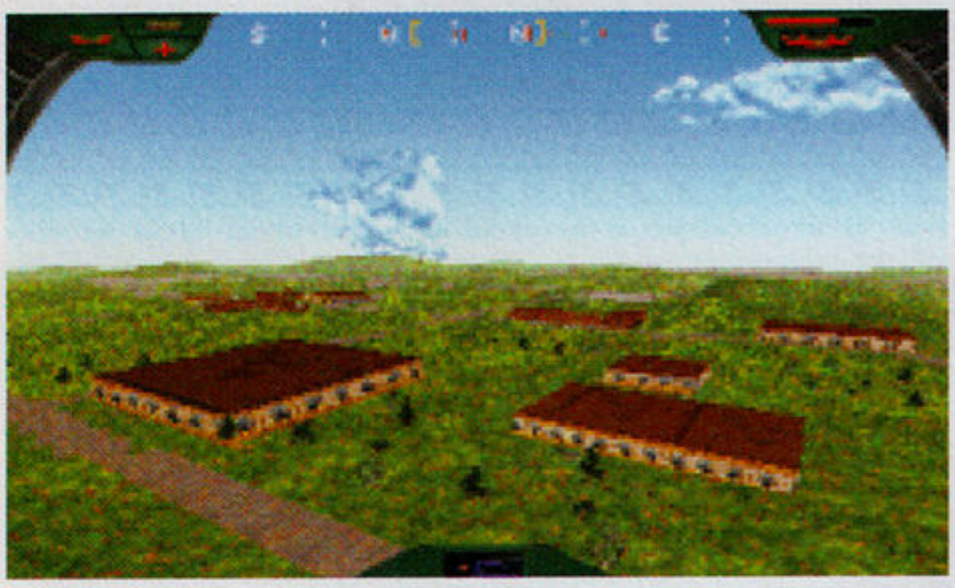
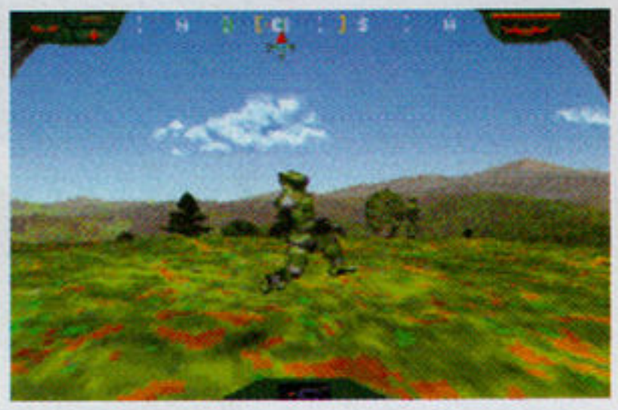


Mountains, fields and chasms are all part of *Terra Nova*'s landscapes



***Terra Nova* is a consummate blend of fluid graphics and strategic gameplay**

behave in a highly realistic manner.

Says Schmidt: "We're really trying to get across the idea that, there are other humans in these suits that are also acting by themselves and you're not this one amazing guy controlling them all."

On the early version of the game **NEXT Generation** fooled around with, it became obvious that the best way to communicate with your teammates was by using the drone aircraft, zipping over to enemies, flying in for a closer look and then directing your men in to attack and fire when ready. You can split the screen when sending out drones, so you can be issuing orders as well as dealing out carnage yourself — all in realtime.

As for the graphics, *Terra Nova* will use Voxel created landscaping in the distance but since the player is so near to the ground, it will employ texture maps close-up in order to avoid the dreaded blockiness which afflicted the likes of NovaLogic's *Comanche*.

This is Looking Glass's first attempt at an environment of this type but many lessons have been learned from the development of *System Shock*. The control mechanism will be similar to that game, with an on-screen cursor to target weapons and move around. While external camera views and the ability to look up and down are being implemented in *Terra Nova*, only limited tilting will be possible and no banking.

The figures themselves are not sprites but are instead based on forms designed, once again, by Seamus Blackley, who has come up with a biped simulation which reproduces the forces on various joints and parts of the body in realtime rather than using prescripted motion. This means that they react accurately to external forces: They trudge laboriously up hills and slide quickly down them, and are flung back realistically when hit. The action is linked by shiny prerendered cinematic segues, which will be familiar to every modern PC gamer.

Most of the ordinance and kit on offer comes as part of your chunky suit and includes jetpacks, radar displays, laser weapons, infrared vision and meaty rocket launchers. The game also includes a scenario builder, as well as existing missions spread across four planets — one Earth-like, one icy, another a desert, and a moon. The hope is that, as well as looking different, these locations will feature different physical properties. For example, the moon will have a lower gravity (as in real life), which will have to be taken into account when firing projectiles. Geographical detailing on all the planets includes roads, underwater areas, buildings and trees.

Terra Nova isn't expected until the second quarter of 1995 but is already shaping up well.

On the technology side, Looking Glass is embracing the move to virtual reality with open arms and is likely to grow into a leading virtual reality producer, since all its new products will support the most popular domestic helmets. *System Shock* is already the best PC virtual reality game and *Flight Unlimited* with a helmet is without doubt an unforgettably stomach-crunching experience.

The company is also working on a highly desirable motion platform. Expected to sell for around $3,500, this bizarre pneumatic contraption will provide true *Flight Unlimited* buffs with the ultimately realistic simulation. **NEXT Generation** tried it out and the effect is truly moving.

There are a couple of other things we can expect from Looking Glass. First, once the nonaggressive *Flight Unlimited* is out of the door, the team will be applying its talents to the production of an air combat sim. Researchers are already gathering data to decide what era the action will be set in.

Now that it's out of the shadows and producing its own games, Looking Glass is finally about to become one of the hottest properties in the ever-changing videogame industry. And it's about time, too. ng

Paul Schaffer is assistant producer on *Flight Unlimited*. His previous job — commissioning aerial photography for a US in-car navigation system — proved very useful

Grand Chaser

Sega's adaptation of CyberDreams' Syd Mead-designed PC racer, *CyberRace*, is nearing completion for the Saturn

Format:	**Saturn**
Publisher:	**Sega**
Developer:	**Sega**
Release date:	**April**
Size:	**1 CD-ROM**
Origin:	**US**

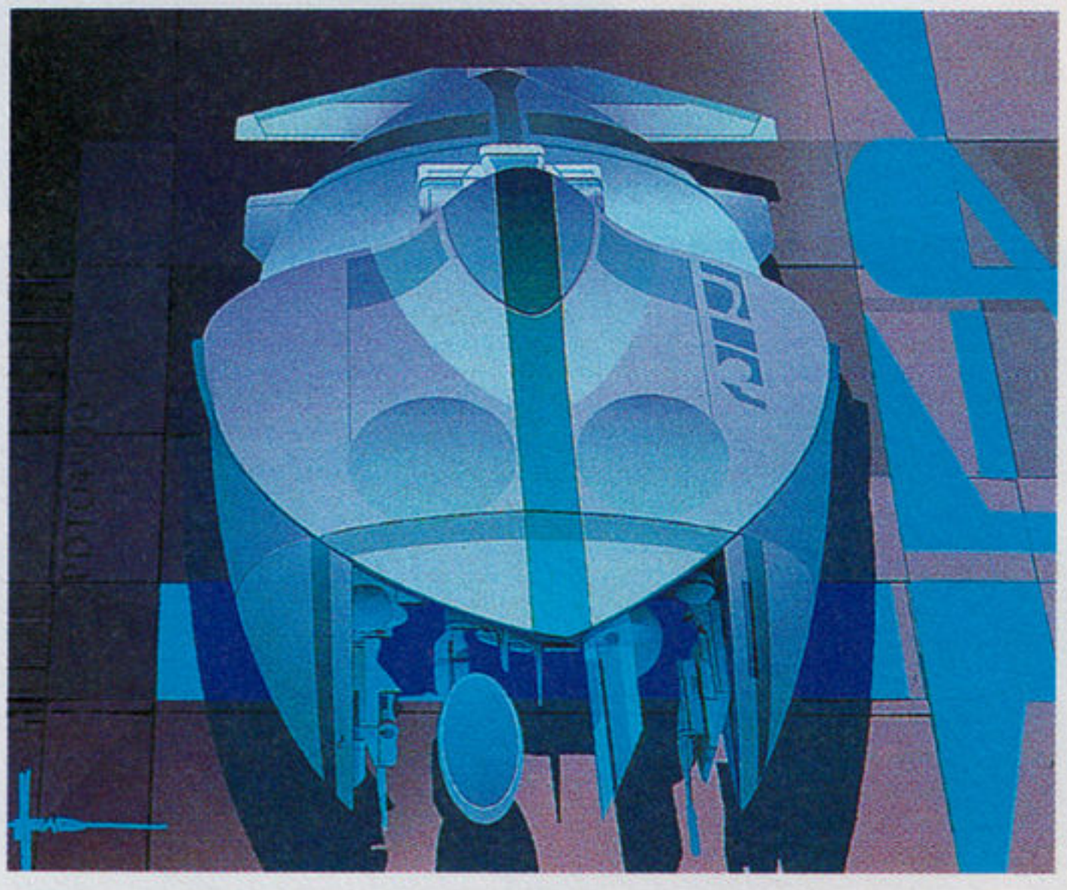
The most graphically impressive of *Grand Chaser*'s circuits is a lava-filled track that weaves between dark mountains

Sega's *Grand Chaser* was originally called *Grand Racer* but was renamed to avoid confusion with another Saturn title, *Gale Racer*. The game is actually a loose adaptation of CyberDreams' year-old PC title, *CyberRace* — a thoroughly average space race game bloated with elaborate story sequences. The out-of-cockpit view and bland Voxel-like terrain are gone; instead there's an impressive texture-mapped polygon roadway and multiple, behind-the-action views.

Grand Chaser is a combat race game featuring heavily armored sleds that float a few inches above the ground and can reach speeds of 500 kph — more with turbo boost engaged. On-screen indicators include a radar, a map of the circuit and a proximity sensor.

Syd Mead, whose Hollywood credits include *Blade Runner* and *2010*, designed much of the original PC *CyberRace*. A flaming river of lava weaving through dark mountain passes is the most spectacular looking course in the Saturn title, but the game's graphics are let down by the bare polygons of the sleds — it's not clear as to whether they will be texture mapped in the finished version. ng

The gauges on this rather empty screen betray *Grand Chaser*'s combat element



The game camera moves around the sleds as they race along the track

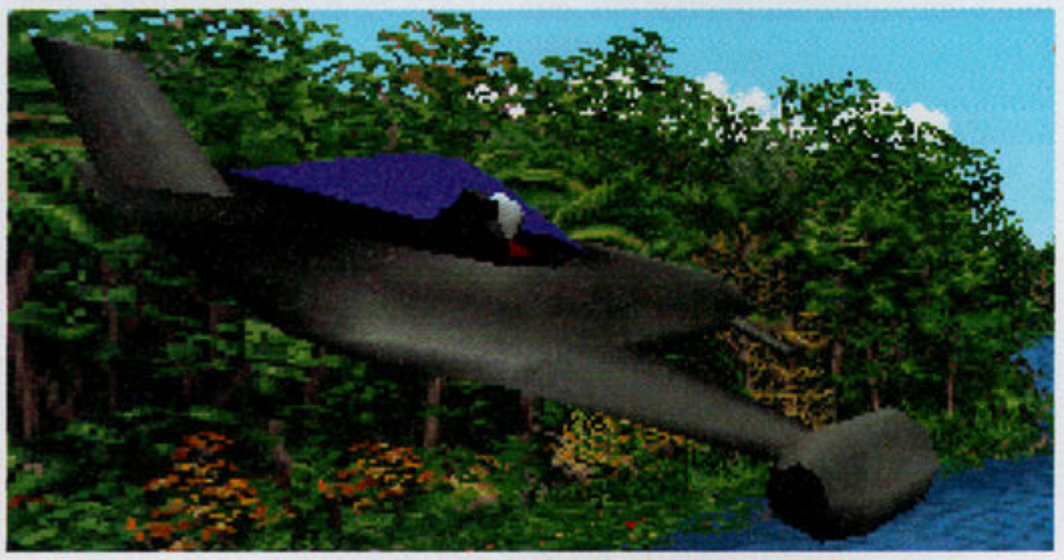
On the face of it, *Grand Chaser* bears very little resemblance to the original CyberDreams PC title, *CyberRace*

ng alphas

Slipstream 5000

Will Gremlin's new futuristic racer give PC players the arcade feel they crave, or is it just another graphic show with a story?

Players find themselves behind the controls of a high-tech flying craft in a no-holds-barred competition



With its smooth animation and high-speed feel, *Slipstream 5000 (above)* is reminiscent of games like *Megarace*. Up to 10 different Slipstreamers can compete at speeds of more than 300 mph

Slipstreamers are young rebel street racers not only bent on defying the law, but gravity as well. Notice the friendly transparent panels

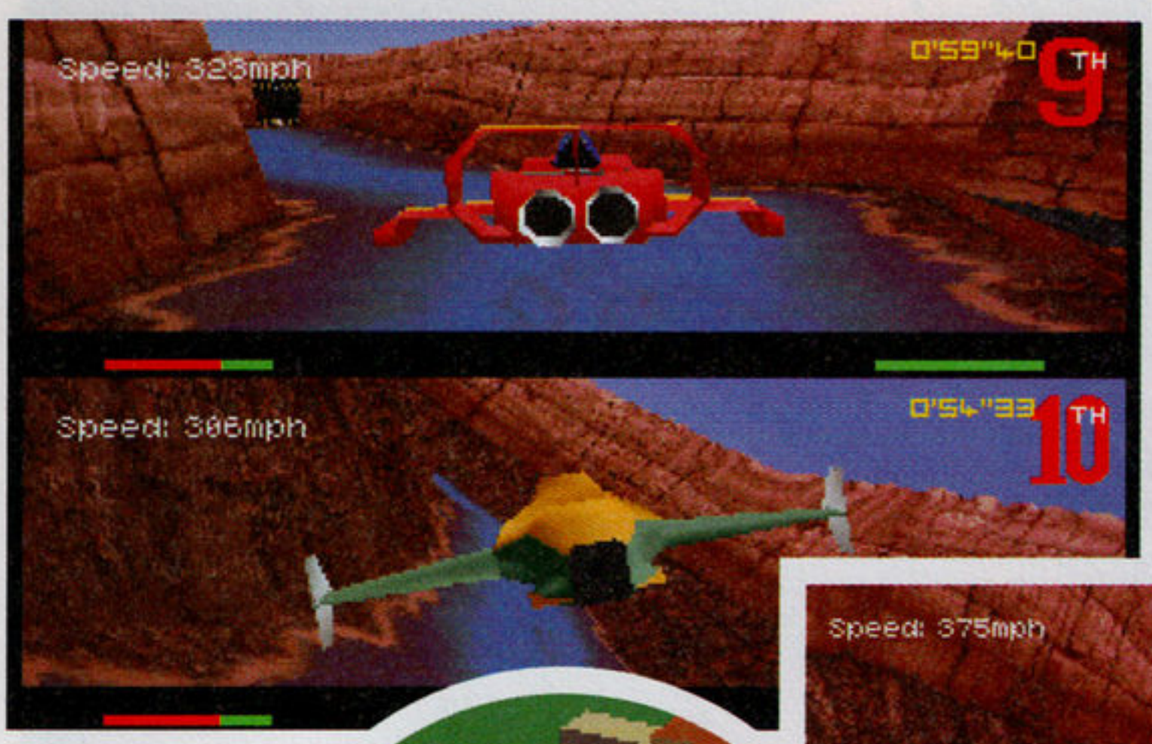
Format:	**PC CD-ROM**
Publisher:	**Gremlin Interactive**
Developer:	**Gremlin Interactive**
Release Date:	**Late March**
Size:	**1 CD-ROM**
Origin:	**UK**

As a new contender in the US PC market, Gremlin Interactive has, in recent months, picked up steam with the release of several new titles and distribution partnerships. Building from the February release of *Retribution*, the company looks to take its software into the mainstream arena with its latest project *Slipstream 5000*.

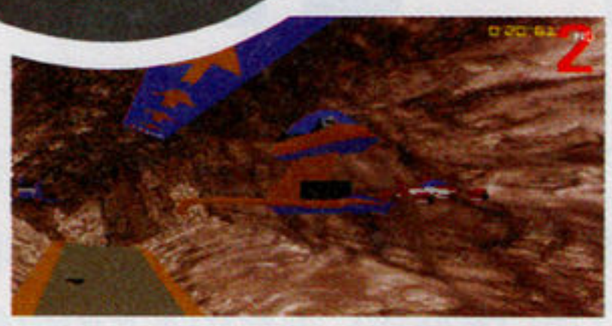
Similar in feel to futuristic racers like *Megarace* and *Crash and Burn*, players find themselves behind the controls of a superfast, high-tech flying craft in a no-holds-barred competition

Could *Slipstream 5000* change the face of racing games on the PC?

ng alphas



Add in a human racer for a competitive challenge (top left). While the Grand Canyon might seem easier than Chicago's bustling streets, don't be fooled (top right), the narrow paths and quick turns will have you mesmerized (above)



Each of the different slipstreamers has its own unique feel. Some are designed for speed (inset), some for strength (middle), and some for quick maneuverability (above)

Adding to the overall flavor of the game, *Slipstream*'s impressive landscapes can be more than just simple, dangerous distractions

of varying tracks all over the globe. Unlike other games however, *Slipstream 5000* has taken a unique approach in using shots of various worldwide cities and landscapes as its tracks. Each of the 10 different tracks has its own pitfalls and dangers ranging from the treacherous turns of the Grand Canyon to the more obvious perils of Germany's Black Forest. The game's graphics are truly impressive and offer not only great backgrounds, but an excellent representation of the vast speeds of which your craft is truly capable.

Head-to-head split-screen competition is also planned, as competitors can choose from 10 different Slipstreaming crafts, customizing their vehicle from a multitude of armor, weapons, designs, and engine upgrades. Each craft has its own advantages and disadvantages and, when controlled by a computer player, will exhibit its own personality as well. After the race is finished, gamers can go back and watch the action from a slick action replay option featuring a multiple camera angle function.

The PC has been notoriously short on good action titles for some time now, and if *Slipstream 5000* can deliver on the promise of its quick graphics and high-speed gameplay, it could emerge as one of the surprise hits of 1995.

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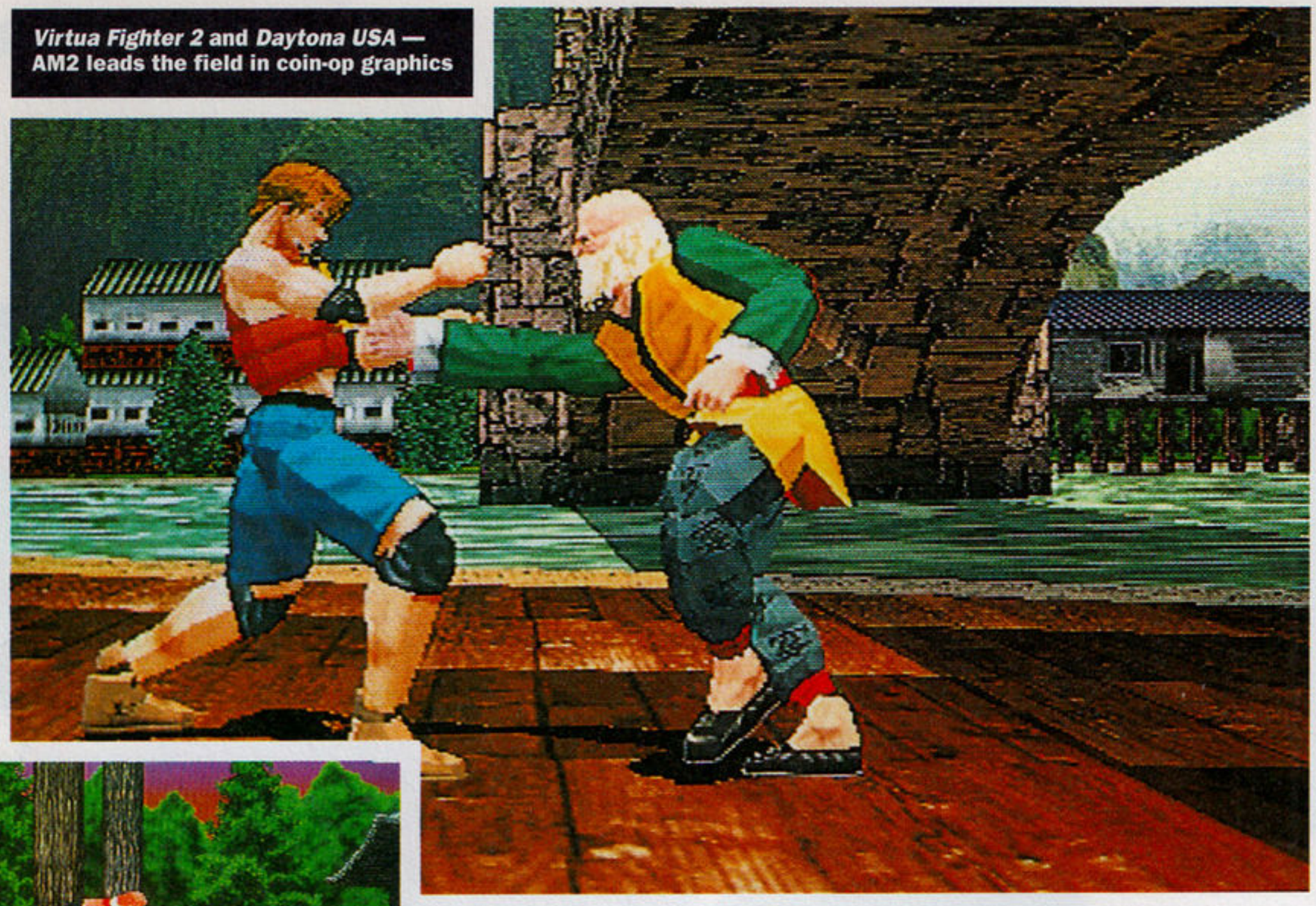
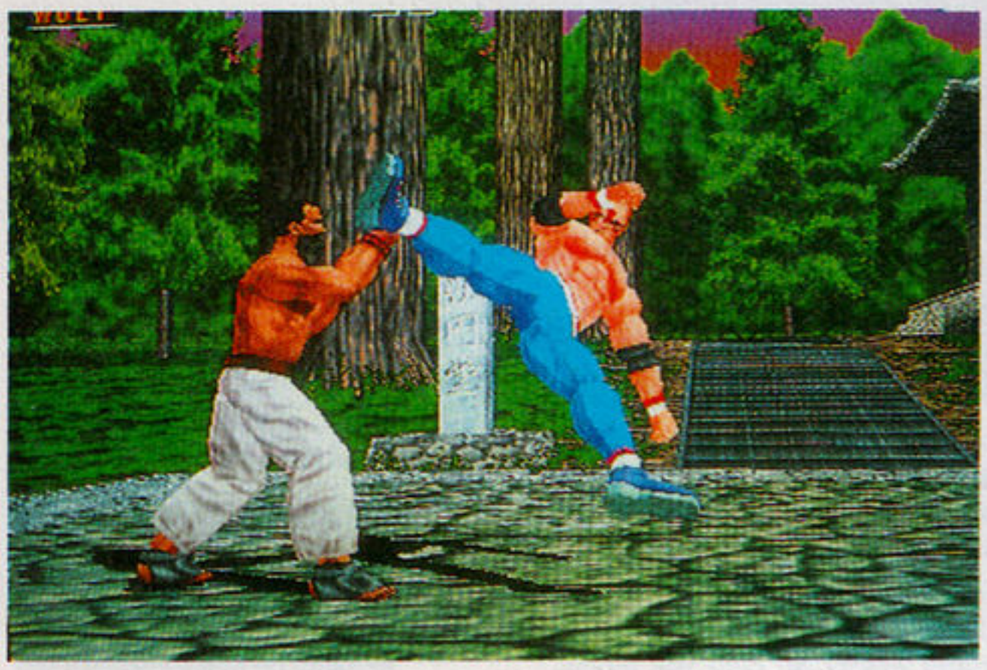
Here are a few of the colorful competitors you'll be up against. Be careful, some of these guys take these races very seriously

Virtua Fighter 2 and Daytona USA — AM2 leads the field in coin-op graphics





AM2

The Saturn has fared well in the traditionally non-Sega Japanese market. The reason: *Virtua Fighter*. **NEXT Generation** visited its creators, AM2

Following a major gaming achievement with something of equal quality is a notoriously difficult task. Sega's AM2 arcade division hasn't just enjoyed the odd repeated success but built an entire reputation upon its ability to deliver groundbreaking products on a regular basis.

After singlehandedly changing the perceptions of polygons in a gaming environment with *Virtua Racing*, AM2 went on to incorporate the same graphics engine in *Virtua Fighter*. The game became one of the most popular coin-ops in Japan's colorful videogame history. And *Virtua Fighter 2*, which was released in late 1994 to the Japanese public, has proved to be an even bigger success.

"The success of *Virtua Fighter 2* hit maximum levels," revealed Mr. Kurokawa, Sega Of Japan's chief publicity manager. "When one person leaves the machine in an arcade another person immediately takes his place — the machines are permanently in use."

People who haven't played either game in the series may find it difficult to fathom their appeal. There are no *Street Fighter II*-style special moves; instead, the fighters use more traditional techniques, and their kicks, punches and throws can seem a somewhat diluted experience at first sight.

But the success of both machines is easily explained, according to Kurokawa: "Fighting games in general are very popular in Japan right now. The fact that *Virtua Fighter* maintained its popularity over an extended period is due to our handling of the games' secret moves. We

The *Virtua Fighter 2* arcade cabinet. Machines will be appearing here in large numbers soon

Mr. Kurokawa and a small selection of the 100 or so items of merchandize which accompany *Virtua Fighter* (left). Sega's coin-op testing area (right)

The dynamics that made *Virtua Fighter* such a memorable title have been carried over to its glorious sequel

Although PlayStation's *Toh Shin Den* turns heads, it doesn't match *Virtua Fighter 2*'s Model 2-generated visuals

deliberately didn't publicize all the moves at the same time but instead revealed them to gamers one at a time by means of the Japanese videogame press. The same policy applies to *Virtua Fighter 2* — all of the moves will be released by February in Japan."

Although the series has pulled crowds in Japan, the reception in Europe and the US has been less enthusiastic. "European gamers seem less interested than Japanese when it comes to the secret moves," believes Kurokawa. "But we still intend to release the special moves for *Virtua Fighter 2* gradually in Europe."

Using exactly the same Model 2 board as *Daytona USA*, it took AM2's team around 12 months to produce *VF2*. Sega is reluctant to reveal the game's polygon count, but it is known that the characters themselves use fewer polygons because of the extra texture mapping that's employed.

The series is far from finished. "We have already begun work on *Virtua Fighter 3*," announced Kurokawa. "*Virtua Fighter 2* has a Chinese theme, but the next game will have a different influence. We may also increase the number of characters available. Actually, during the development of *Virtua Fighter 2* we designed four new characters but only two made it into the game: Shun and Lion."

Beyond the furthering of the *Virtua Fighter* cause, AM2 is continuing to demonstrate an interest in the Saturn. After its explosive porting of the original, work is under way on the sequel's conversion. "Saturn's *Virtua Fighter 2* production has started," Kurokawa disclosed. "The characters have already been animated on the development workstation so body movements are possible, but we haven't done the attacks yet."

***Virtua Fighter 2*'s backdrops differ greatly from the first game. Instead of flat horizon views it incorporates proper 3D features**

As well as a *Daytona USA* conversion — now 40-50% complete — AM2 is soon to begin work on a Saturn version of *Virtua Cop*. It will also be producing games for the ST-V board. "We are concentrating particularly on developing original software for the ST-V," stated Kurokawa.

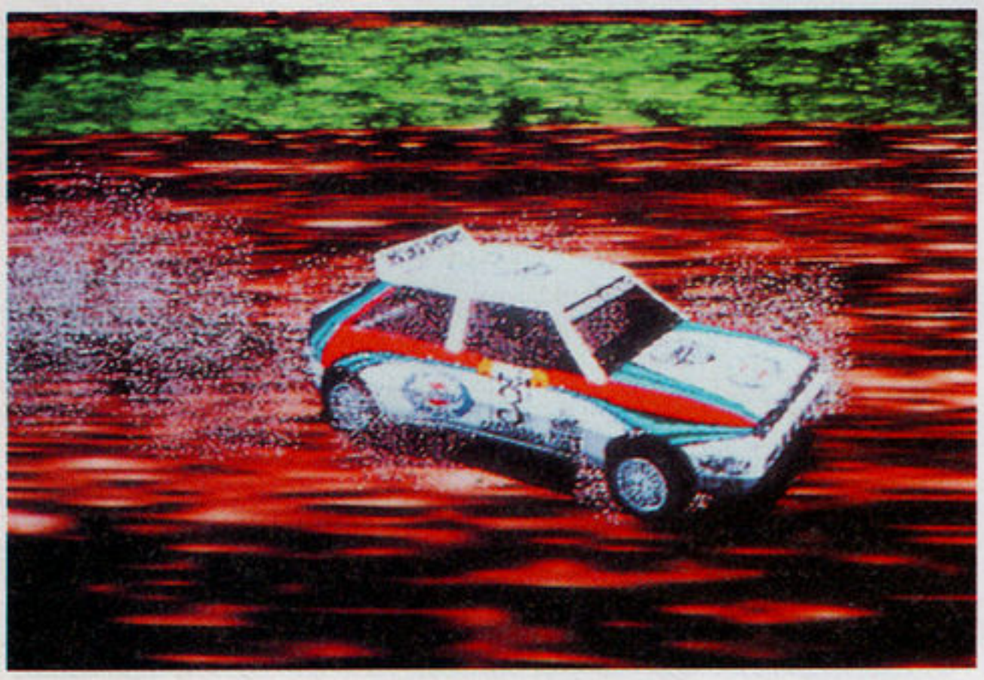
Kurokawa also talked about Sega's US launch policy for the Saturn during **NEXT Generation**'s visit: "The marketing positioning is different. When the Saturn is released in America the MPEG, CD-V and Photo CD systems will be available. The machine will be sold more as a home multimedia machine than a game machine."

Whichever way Sega approaches the US launch, if the machine can cause such waves in a territory relatively foreign to Sega in terms of sales, its success on more familiar ground is fairly well assured. With AM2 behind it, it's certainly difficult to see how it can fail. ng

Given that AM2's conversion of *Daytona USA* is still only 40-50% complete, a Saturn version of *Virtua Fighter 2* is unlikely to appear before autumn 1995

Sega's first ST-V title, *Golden Axe: The Duel*, is likely to head Saturnwards

***Sega Rally*'s attract mode features dozens of jawdropping sequences**



AM3

Sega's newest arcade division is aiming to put itself on the map with an ultrarealistic rally simulation. **NEXT Generation** dropped in for a look-see

Sega is shifting up a corporate gear in an attempt to dominate the competitive arcade driving game market. After AM2's worldbeating *Daytona USA* comes *Sega Rally*, an even more ambitious game, developed in-house by fledgling team AM3. "We wanted to make a racing game that was very different to all the others out there," declared Kenji Sasaki, the project's director and designer. "We were really impressed by rally as a sport in America and Europe and felt it could work well as a videogame."

By entering into a partnership with renowned rally car manufacturers, AM3 has been able to incorporate a more realistic feel into *Sega Rally*. The 1992 World Rally Championship-winning Lancia Delta appears in the game alongside a 1994 Toyota Celica, thanks to an unusually relaxed agreement between the three companies. Not even license fees were discussed as the car engineers who were involved were pleased to assist with the project.

NEXT Generation played an unfinished version of the game during its visit. Although there are still numerous cosmetic changes to

The *Sega Rally* coin-op will feature AM3's 'active shock generator'

The project's designer, Kenji Sasaki, also created the game's press ads

Producer Tetsuya Mizuguchi is a big fan of real-life rally racing

Sohei Yamamoto, who previously programmed the *Star Wars* coin-op

Like Namco's *Ridge Racer 2*, *Sega Rally*'s cockpit features a rear-view mirror for extra realism

The texture-mapping capability of the Model 2 board has allowed the AM3 team to go overboard with car decals

As well as a practice mode, *Sega Rally* will offer three levels of competition. A bonus stage is set in northern Europe

be implemented — such as spectators and animals appearing trackside — the driving feel itself is mightily impressive. The speed of the cars is most obviously lower than *Daytona USA*'s (at around 125 mph maximum) but play is still brisk and the rally environment is completely engaging. And certainly, the stage-by-stage rally format does provide more variety than *Daytona USA*'s plain oval tracks, and the cars themselves are more interesting when you get behind the wheel.

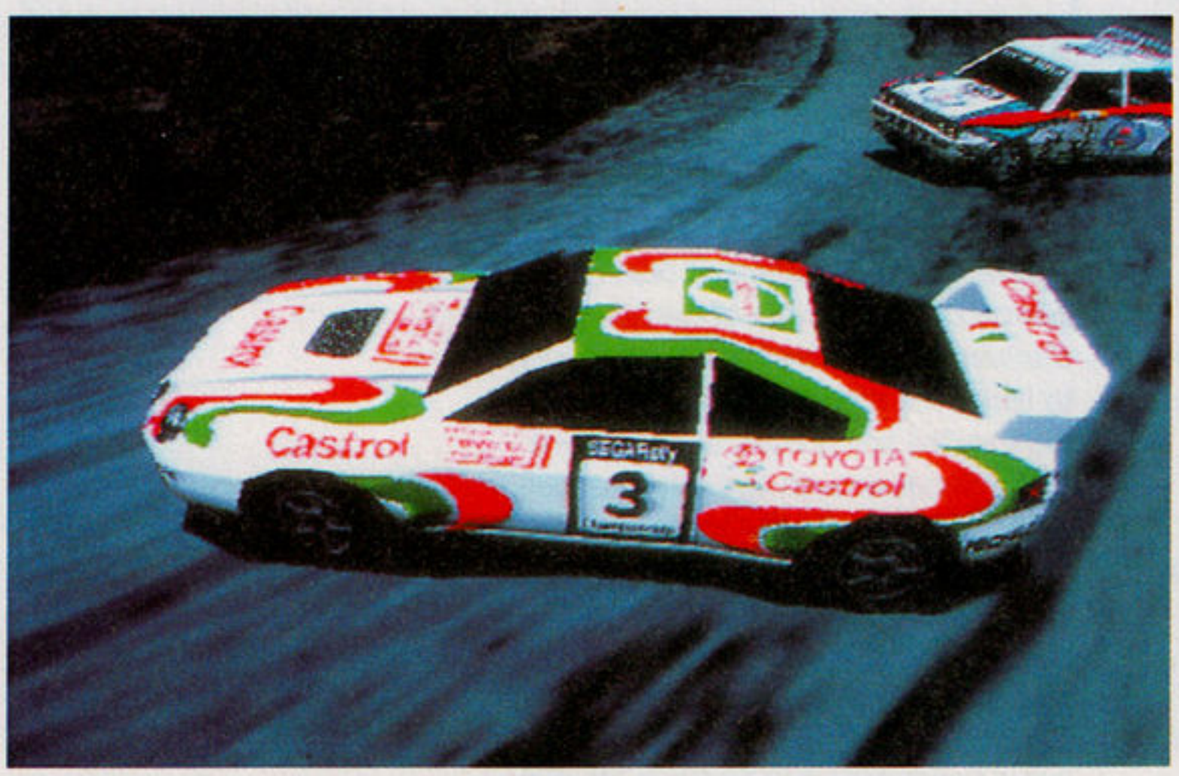
"The game also uses something we call an active shock generator," explained producer Tetsuya Mizuguchi. "This makes it feel more realistic. The seating moves to relay the relationship with the road and it also reacts to knocks with opponents' cars. The cabinet features steering feedback and we also concentrated on trying to make the soundtrack convey reality." The cabinet actually contains two independent motors in order to achieve these effects, compared to the single device in the *Daytona USA* cabinet.

Daytona USA is enhanced by the opportunity to play with a group of friends. Mizuguchi has similar plans for *Sega Rally*: "Four players can compete against each other with a linked setup. It will be possible to choose among different cars, and not only will the car colors differ but also the characteristics of the cars."

AM3 has labored long and hard over the look of the game. Its efforts are eased by a Model 2 board now in its second generation and more powerful than the version incorporated in *VF2*. Although the latest board still lacks true transparency effects, the team has emulated them by means of careful programming. In contrast to *Daytona USA*'s grayed-out windows, the cars in *Sega Rally* have translucent panes — it's possible to see the driver through the rear window, and occasionally even cars in the distance beyond that. Generally, the level of detail is significantly higher than *Daytona USA*'s and AM3 is confident the finished product will look superior to the efforts of its close neighbors.

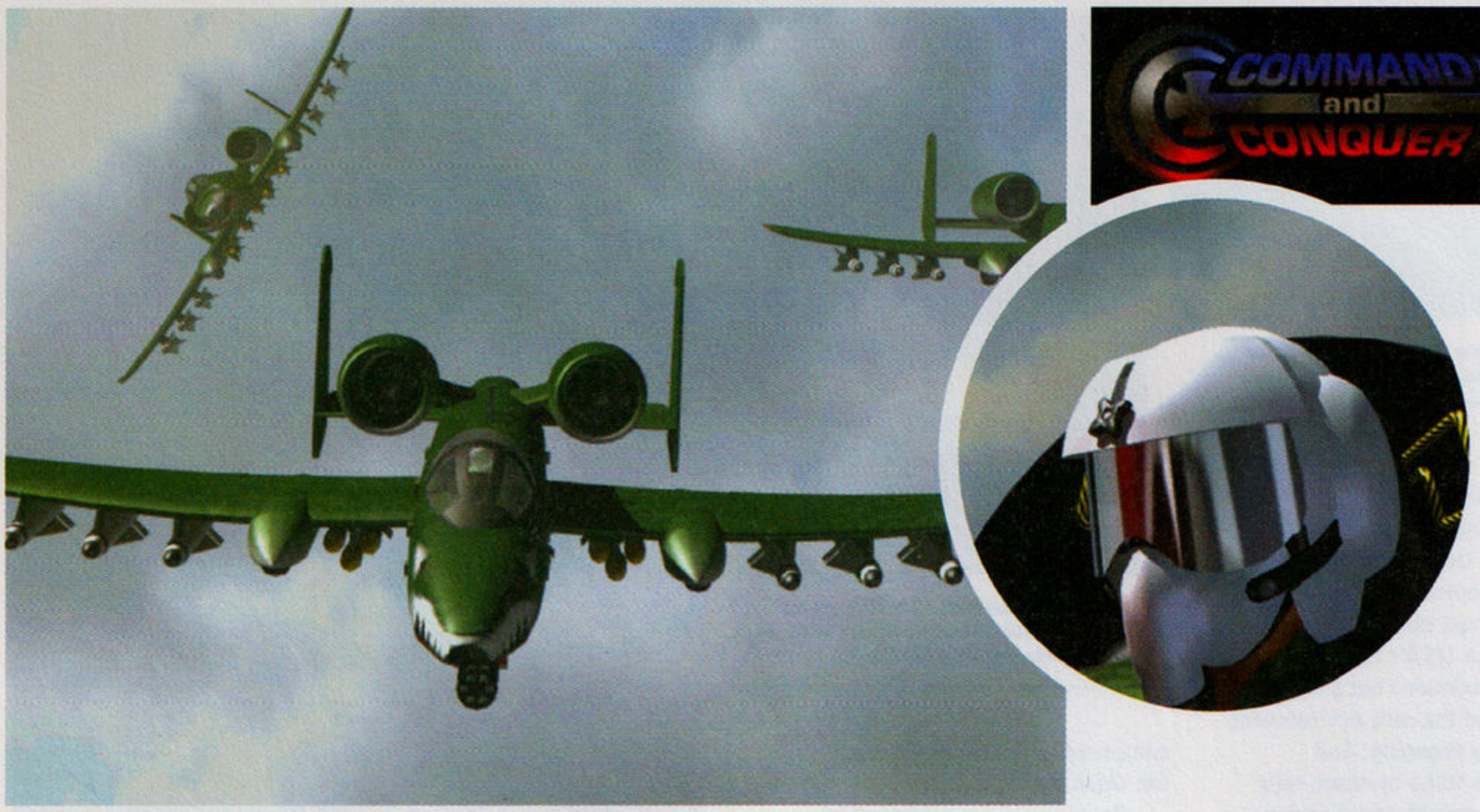
At the programming helm is Sohei Yamamoto, whose past work includes *Moonwalker*, *Rail Chase* and *Star Wars*, among others. He revealed that there have been hiccups. "The skidding of the cars through bends was the most difficult point to realize," he admitted. "The jumps the cars take over bumps were also hard work."

However, *Sega Rally* is continuing to shape up and promises to be an experience to beat even *Daytona USA*. US gamers should be able to test the machine when it appears here in early April. ng



Toyota and Lancia engineers assisted AM3 with the cars' dynamics and performance. The game looks set to be the most thrilling driving coin-op yet

An AM3 sound technician gets to grips with *Sega Rally*'s aural content



The rendered cut scenes add to the already absorbing atmosphere by fleshing out the details of the virtual future (above). Westwood's slick new logo lets players know they're not in Arrakis anymore (top right). An incredible level of detail is available in the frequent close-ups (inset)

Command & Conquer

Westwood upgrades its addictive *Dune II* engine bringing it together with a host of new SGI minimovies and an amazing new gameworld that's not that far from our own

Format:	**PC CD-ROM**
Publisher:	**Virgin**
Developer:	**Westwood**
Release Date:	**Late March**
Size:	**1 CD-ROM**
Origin:	**US**

Two years ago, Westwood released one of the most impressive strategy games ever developed for the PC. Unlike most license games, *Dune II* gave players a chance to experience the battles as well as the rather weighty economic difficulties on their own terms, rather than following along a predefined storyline. More than just a simple war game, the title included elements of *SimCity*-style world building, the economic and research factors of *Civilization*, and of course, good old-fashioned death and destruction in the vein of Sensible's *Cannon Fodder*. The interface was easy to learn, the story lines and rewards were varied and unique, and the game was difficult enough to challenge even experienced players for months — a hard act to follow all in all. Westwood has surprisingly taken the time and money to ensure that its second foray into the strategy arena, *Command and Conquer*, will not only employ today's latest technology, but features all of the

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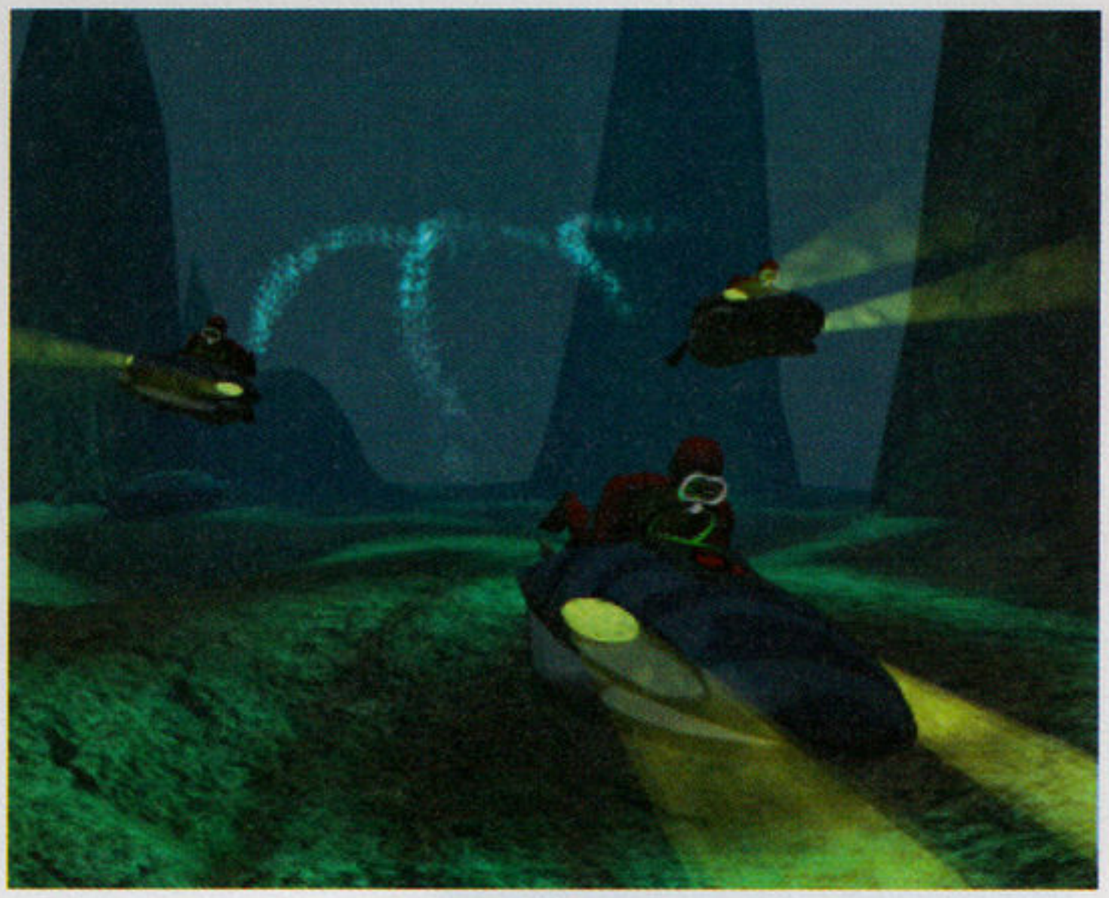

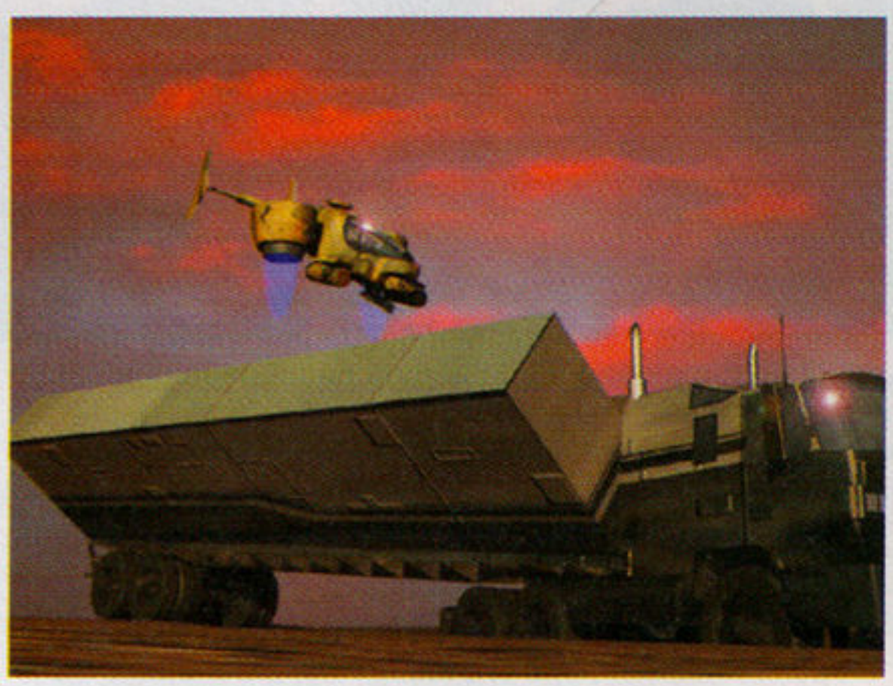

The war for the world is fought on all fronts, from the depths of the ocean to the all-important acquisition of land (and the resources that go with it). The successful player will need to keep his or her eyes everywhere (above)

Raids under the cloak of night can help an outmatched army achieve victory (top). Strange new armaments include powerful weapons and sly carriers (above)

The symbols of the two battling giants represent the philosophy behind the armies. Like a scorpion, the Brotherhood's rapid strikes leave wasted land in their wake. Conversely, the G.D.I. is in the position of defending the freedom of the entire planet

elements that made *Dune II* a classic.

In order to free themselves from the plot restrictions (and cost) of maintaining the *Dune* license, Westwood's designers decided to strike out on their own to create an entirely new game world from scratch. The end result is a slightly futuristic plot line that is just far enough away from reality to evoke a sense of discovery and just close enough to it to create a frighteningly realistic atmosphere.

the story develops in this manner: In 1989, the United Nations was threatened by the heightened activity of increasingly well-armed terrorists and passed what would become known as the Global Defense Act in response. The globally sanctioned legislation hallmarked the creation of a specially funded strike force that would supposedly answer to the Security Council allowing the UN to handle situations requiring the use of force, quietly and covertly. The new army (called the Global Defense Initiative or G.D.I.) was equipped with the latest weaponry and technology and soon began the mission of eliminating the threat of terrorism and war in its various forms around the world.

Enter the Brotherhood of Nod, an ancient sect bent on world domination, evil rituals, and the return of disco (no,no, just kidding, they're not that bad). Using Mafialike tactics, the Brotherhood waged war from cells all over the world, eventually forcing the actions of the super-secret G.D.I. out into the open. Now the war is waged between the two superpowers, each using the most powerful weaponry ever created, and the final outcome will determine the fate of the planet.

Fans of *Dune II* will discover that *Command and Conquer's* interface is close enough to the original system that they will most likely be able to pick up and play the game with little relearning required. The development team spent a good amount of time sorting through player's suggestions, coming up with its own innovations, and incorporated everything into the game. Everything has been improved, from the brand new modem options to the streamlined interface, all with the final goal of making the game not only more entertaining, but easier to play. Perhaps the most impressive change is in the intense new approach to game graphics.

Traditionally, the biggest drawback to strategy games is their lack of fully conceived graphics. Since graphics generally don't play a big part in actual gameplay, most companies don't spend much time creating them. But after creating an entirely new world, Westwood stood by its decision which is

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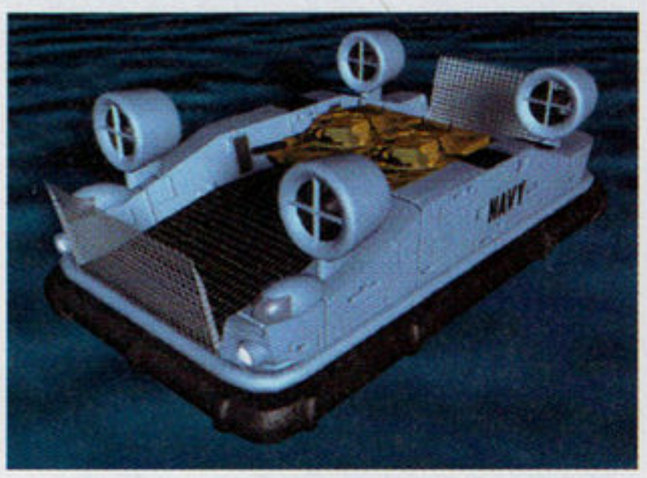
With the constant exchange of the most powerful weapons the world's ever seen, it's often the local scenery that's hit the hardest. Be sure to keep an eye out for civilians, they make or break your campaign (above)

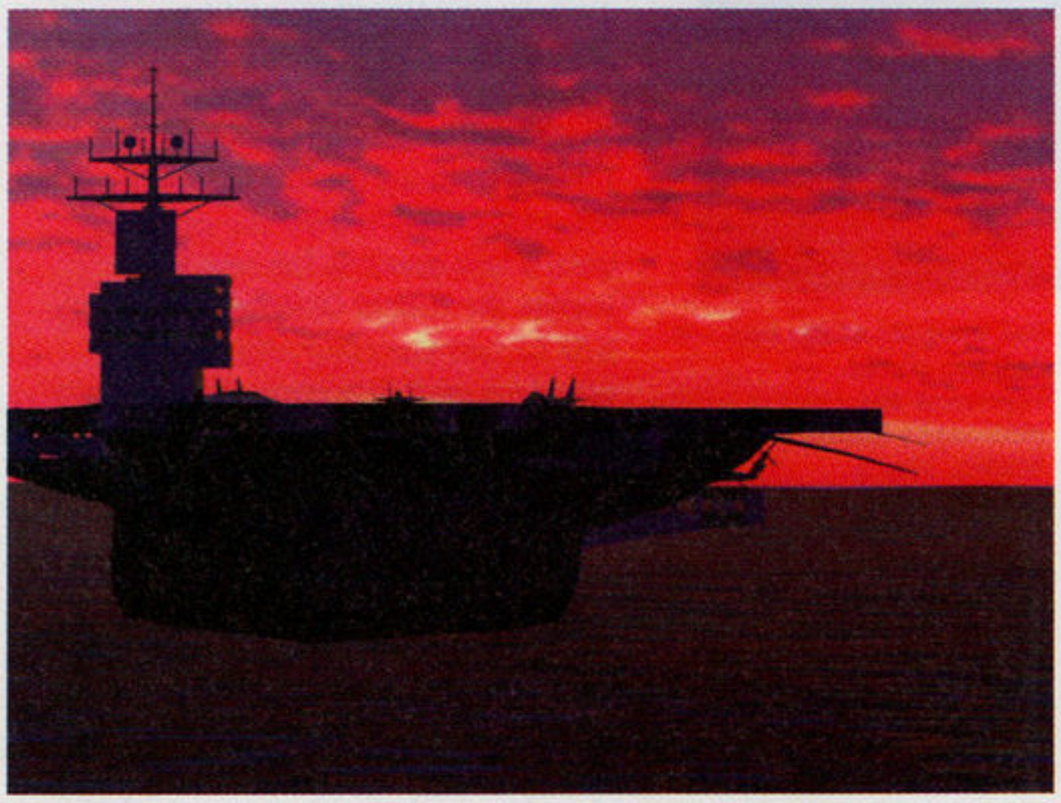


A selection of the game's more conventional craft. Desert warfare demands an appropriate vehicle. Heavy radar capability can help you avoid nasty surprises (top). Even in the future, you just can't beat a tank for straight-forward destruction (center). Large bodies of water require innovative solutions to troop movement (bottom)

Perhaps the most impressive change from the *Dune* titles is in Westwood's intense new approach to *Command and Conquer*'s graphics

to give its players as lifelike a representation of the Earth's dark future as possible. The game places the player into the action with incredible FMV television broadcasts, intelligence reports, and details of onsite battles. Also included in these minimovies are brilliant scenes of destruction fully rendered with the increasingly ubiquitous *3-D Studio* package. Actual gameplay takes advantage of these lifelike renderings touched up by the team's art staff. Coming up with terrain realistic enough to stand beside the crisp, rendered objects while still allowing players full visibility proved especially challenging for the designers, taking them through many different trials of rendered, digitized, and drawn layouts before finally developing a working technique. Using digitized photographs of various terrains, the artists manipulated the photos to create not only a realistically blended result, but they're visually friendly as well.

Improving the actual gameplay was a much greater challenge for the designers. Building off the excellent playability of the original *Dune II* engine, the team wanted to add new features and strategies without upsetting the balance that made the game so great. Again, looking at ideas and suggestions sent in by players, the team found that many gamers wanted to see more scenarios requiring specialized strategies. In order to accomplish this, the design team stepped away from the traditional "kill-all-enemies" approach to level design; they dreamed up original scenarios that enabled players to use their minds to win — instead of relying on brute force. Mission objectives vary: from simple escort sorties to the more difficult and lengthy base-establishing or capturing-of-the-enemy-unit missions. Depending on your level of success, each



The varying terrains of *Command & Conquer* require a whole new strategy from *Dune II*. Here, a carrier defends the waves from an enemy incursion

mission can lead to three others, a full game consisting of 30 to 40 scenarios.

Although *Dune II* had three sides, most of the unit types were essentially the same, with each side specializing in a few weapons that were specific to its side. In *Command & Conquer*, each of the two warring armies have armaments that vary widely even on an infantry level. Following the story line, each side uses weaponry representing that army's mentality and typical approaches to combat. The GDI specializes in humane combat — typical Geneva Convention arms geared toward a strong defense. New unit types include *Orca* helicopters, *Mammoth* tanks (big tanks with heavy defensive capability), Biolabs (For super-soldier type research), and Firestorm Defenses (a bigger version of *Dune II*'s gun turrets). The Brotherhood uses tactics that are almost the opposite, preferring terrorist style kill-and-escape runs that leave not a thing standing in its wake. Due to its scientists' lack of regard for human life, the Brotherhood also takes advantage in producing soldiers genetically and cybernetically enhanced for fighting. Its unit types include The Temple of Nod (details are being kept quiet by Westwood, but rest assured it's not going to be a nice place), the Obelisk (a large structure that kills everything in range indiscriminately), Flame tanks, and Stealth tanks. Adding to the mass confusion of the battlefield, the new engine includes rules for civilian personnel and structures that can be recruited, killed, captured, etc.

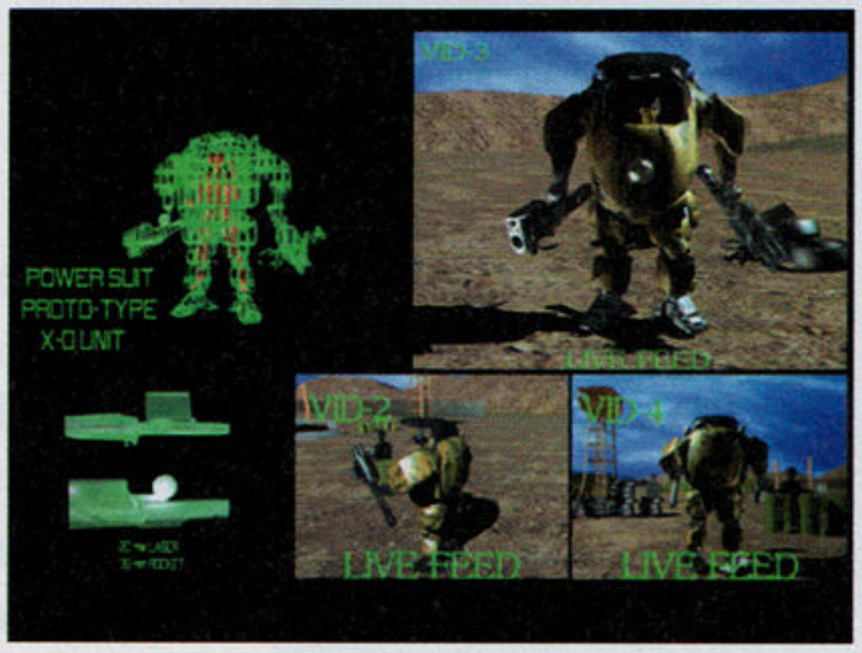
Where *Dune* essentially took place on sand alone, *Command and Conquer* will take place on battlefields from several terrain types across the world.

More than just different art, terrain plays a very important role in the game's strategy. Some units will have advantages on the terrain types for which they're designed, while others will offer camouflage and other advantages in the right locations.

The game will contain desert, winter desert, temperate, and winter temperate locales, and the possibility still exists for the addition of jungle, night, savanna, and underground urban areas at the time of this article. Various terrains will play a major part in the way scenarios are laid out and will offer a great tactical advantage to the player who figures how to use them.

Other features to be included are stereo and 16bit sound options with digitized voice feedback, original soundtrack (complete with rock, military, and classical pieces), a mixer option enabling players to program the various tracks included, and best of all, options for both internet and modem play. Nothing has been left out in the attempt to make *Command and Conquer* an all-out strategy masterpiece. Expected to ship in April, this is one every true PC gamer should be keeping an eye out for. ng

The mix of digitized and rendered graphics (top left) creates an appealing landscape that's a far cry from *Dune 2*'s (above)



From the command center, you receive video updates in an impressive combination of FMV and rendering techniques

SimIsle

Destroy an island paradise or preserve its natural beauty — the choice is yours in Maxis' new PC ecologically-minded simulation

Topographic grids can be used to assist planning (inset). A friendlier map (above)

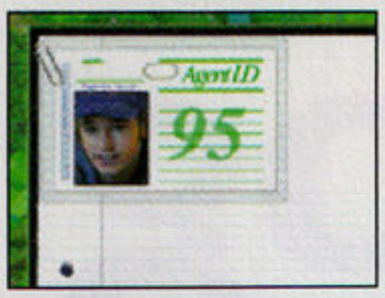
As you fly the tourists in over the oil rig and show them the deforestation their presence is causing. Is this merely a lush *SimCity* rehash?

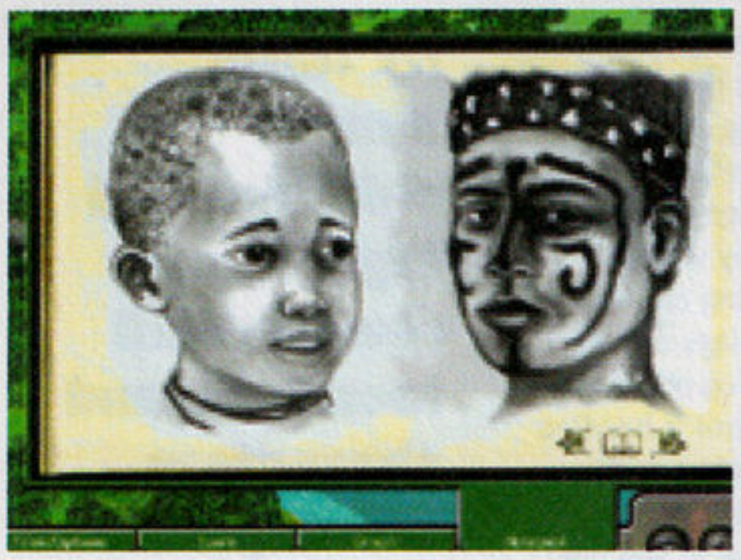
Format:	**PC CD-ROM**
Publisher:	**Maxis**
Developer:	**Intelligent**
Release date:	**April**
Size:	**1 CD-ROM**
Origin:	**UK**

The game is set on an island once covered by lush rainforests and populated only by native tribes which now faces the onslaught of 20th century capitalism

Maxis' ability to produce engrossing simulation games has never really been in question, but the danger is that it will eventually run out of things to 'sim.' Luckily for addicts, that point hasn't been reached yet.

SimIsle is Intelligent Games' first contribution to the field. The game is set on an island which was initially covered





Recruit special agents (top). Zoom out for an overview of your island (middle). Meet the indigenous people (bottom)

by lush rainforests and populated only by native tribes but now faces the onslaught of 20th century capitalism. This idyllic spot is not only in danger of being swamped by tourists but also offers billions of barrels of oil, logging, and a handy base for drug barons.

The environmentally friendly will try and protect this Eden, but many will no doubt be lured by the lucrative development opportunities on offer. Competition with rival companies, industrial disasters, general sabotage and global warming will affect everything involved.

Behind the moral questions lurks what looks like a highly playable and technically competent game. All the views are presented in fully light-sourced SVGA and the range of scenery ensures that it doesn't become repetitive. The entire view can be zoomed in and out and rotated.

SimIsle hopefully marks Maxis' return to accessible and enjoyable simulations, rather than its recent tediously statistical exercises. ng

Tir na Nog

An adventure game steeped in European Celtic legend provides the fantasy setting for some of the most unusual visuals ever committed to the PC

Format:	**PC CD-ROM**
Publisher:	**Psygnosis**
Developer:	**A Jovial Crew**
Release Date:	**June**
Size:	**2 CD-ROMs**
Origin:	**UK**

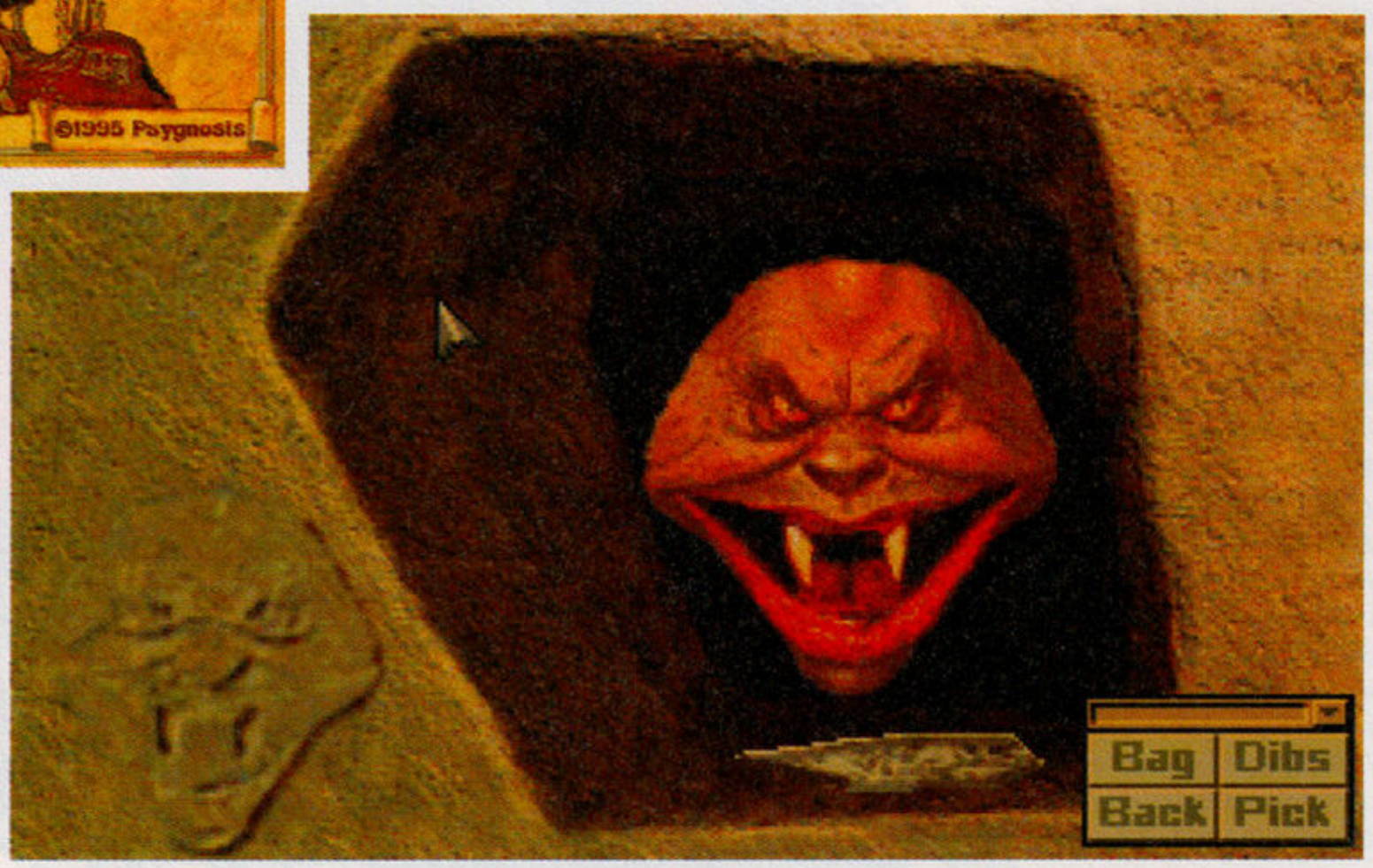
Tir na Nog is a game whose origins actually lie in an animated graphic adventure title of the same name, released in the UK on 8bit computers back in 1984. Now, 10 years later, the original story has been revived by the original team, and the game concept brought up-to-date.

On paper the ideas behind *Tir na Nog* appear very classical. It adheres to a fantasy adventure format, though this time it's based on real legend — the game's hero Cuchulainn is a prominent figure in European Celtic mythology. And a cursory glance of the game's storyboards reveals a design very much rooted in solving puzzles by visiting locations and find then using objects.

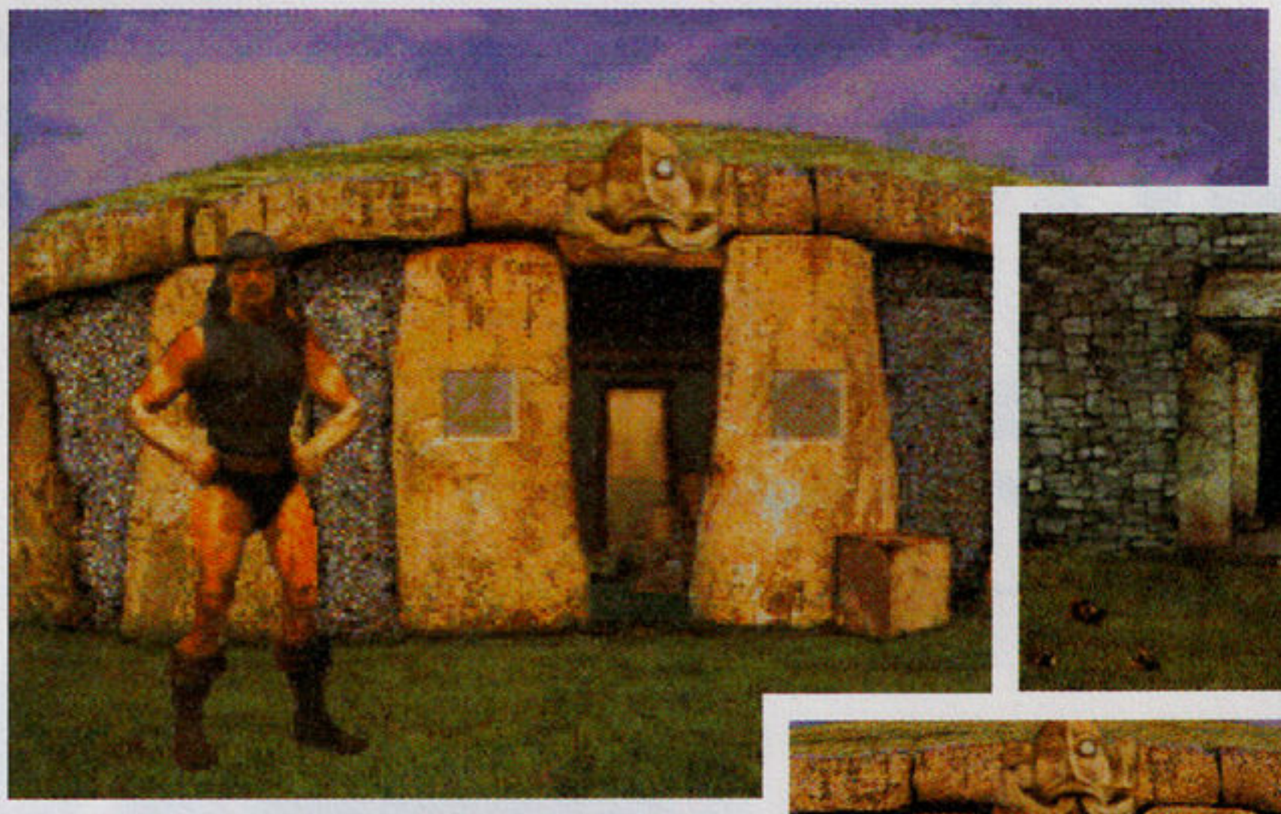
But it's in the way it plays and the way it looks that *Tir na Nog* promises to make its mark. All control is handled with the mouse, as you might expect. But the central characters' range of moves, their ability to move in and out of the scenery and actually fully react to, and interact with it, make the game more flexible than many of its fantasy/adventure contemporaries.

Perhaps the graphics are the elements which really set the game apart, though. By turns almost childlike

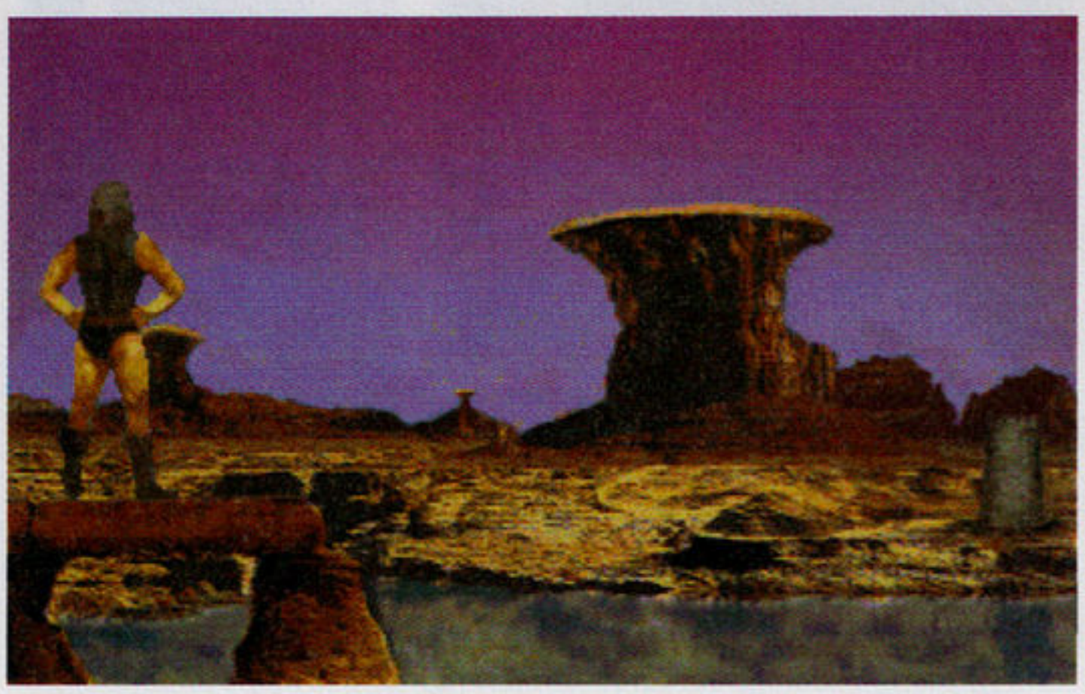
By turns almost childlike and ingeniously realized, all locations and characters are depicted in a highly animated and overtly stylized way



Based on a real Celtic legend, *Tir na Nog* meshes old European mythology (left) with stylishly new interaction. Just imagine *The Hobbit*'s Bilbo on steroids (and in Ireland!). Beware unfriendly neighbors (above)



While some may will sneer at *Tir na Nog* as a retrogame, it's actually a rewrite of the original



Although a bit of flexing and posing is overly apparent (top), game structure entails countless subplots (above)

Yes, Cuchulainn, while quite butch, looks a little unprepared for war (inset)

Most of the scenes were produced using collage techniques. Photographs were drawn or paint on, scanned in, the process is repeated over and over

and then ingeniously realized, all locations and characters are depicted in a highly animated and overtly stylized way. Greg Follis, one half of the game's development team from A Jovial Crew, explains: "I produced most of the scenes using collage techniques. I take photographs, then draw or paint on them, scan them in, and then do it all over again. A lot of the animation is done by [videotaping] then taking drawings of the snap frames, as opposed to putting it through a video digitizer. It gives you a different sort of animation. The results can be very, very individual."

If you encounter and disturb this monk, he'll yell at you that he's taken a vow of silence

But the thing which promises to really "wow" PC gamers though, is the central character. Occupying up to a third of the height of the screen, Cuchulainn is far more than just an animated sprite. With a whole repertoire of actions and reactions, the game's central hero really does at times appear to be moving, living, and breathing within the confines of the game world.

Cynics might sneer at the idea of recycling a 10-year-old game idea. But it's been done to great effect in excellent titles like *Tempest 2000*, and as Follis points out, "Well, reusing an idea works in the film and music world. The game is a rewrite of the original story. This is much more than a retread of our old game."

With over 200 richly detailed locations, a game structure which weaves countless subplots, characters and lands together, and some of the most unusual use of game sound yet — the game promises to have a couple of ingame songs in the final version — *Tir na Nog* is shaping up as a serious cinematic-style adventure. And with its reliance on interactivity rather than prerendered scenes, it also promises to put supposedly interactive movies such as *Hell* in their place. But if it should fail, *Tir na Nog* is still to be applauded for its attempt to approach the adventure game in a new way. ng

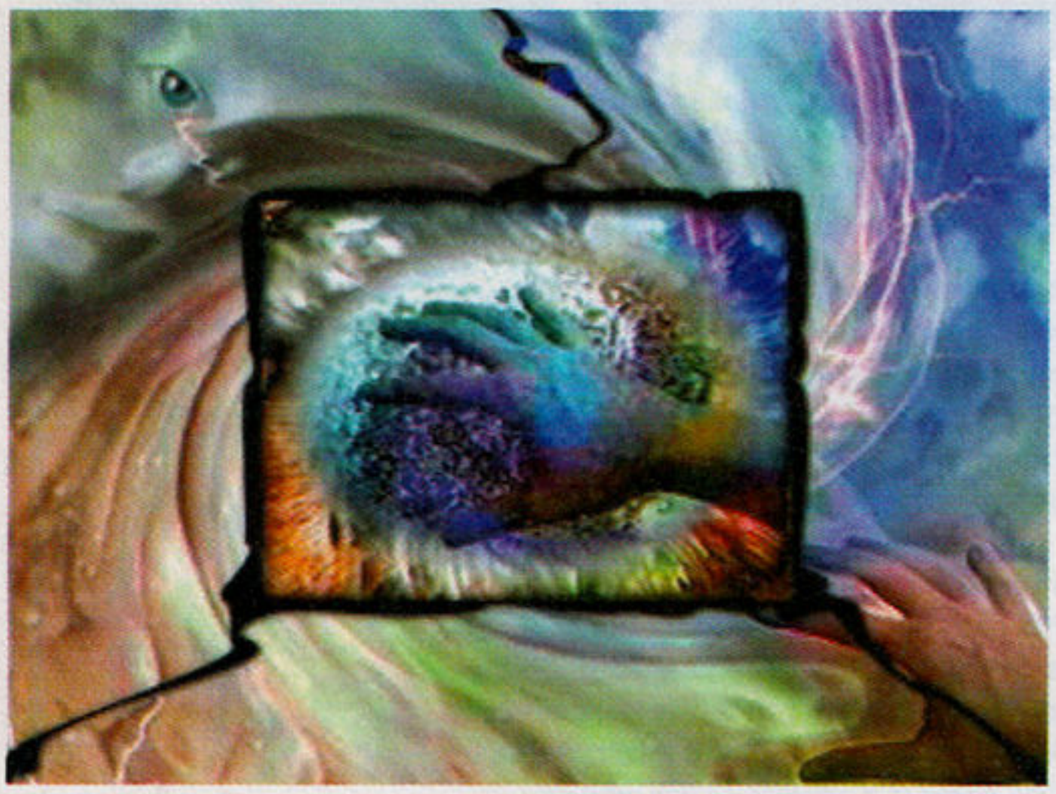
Psychic Detective

If the phrase interactive movie induces a world-weary yawn, wait. If anyone can get it right, maybe it's Electronic Arts

Format:	**PC, Mac, 3DO**
Publisher:	**Electronic Arts**
Developer:	**Electronic Arts**
Release Date:	**June**
Size:	**2 CD-ROMs**
Origin:	**US**

This is the girl your mother warned you all about, and her friends are fun, too

The faces around the screen represent other people within your psychic vicinity. You can choose to see through their eyes



At this stage you are playing the game from your own point of view

But this silence is soon to change, and one of its first next generation titles to be showcased is *Psychic Detective* — an interactive detective thriller produced in collaboration with Colossal Pictures. Set for release this summer, *Psychic Detective* hopes to break new ground in the interactive movie genre. A new ingredient included in the mix is that there are no stops in the action for the user to decide where to go next; interact when desired or don't interact at all — either way the viewer gets continuous video of a story playing itself out.

That Electronic Arts is investing big bucks in developing an interactive movie gives credibility to a struggling, new genre. And it will be truly interesting to see what the world's most successful independent game producer does with it.

ng

Touching objects can result in psychic flashes

Electronic Arts is the biggest, most successful third party game publisher in the world. But for the last year or so, the California developer has been ominously quiet. And despite a couple of superb 3DO releases, the company has shown nothing of its plans for PlayStation or Saturn. And while displaying a cautious reticence in divulging its alliances for the upcoming 32bit war is one thing, outsiders could be convinced that EA has shut up shop.

Gruesome. But is she the murderer?

Silverload

Welcome To Silverload, A Devil Of A Town.

Folks don't come to Silverload much anymore. A'int been no silver here in years. And when they do come, they don't stay any longer than they have to. Missing persons? No, mister, a'int never seen no missing persons. Of course, folks here don't pay much attention to strangers. Have a look around? Can't say anybody will stop you from looking around, mister. Except the last man who came here looking for kin is buried over there on that hill.

VIC TOKAI INC.
22904 Lockness Ave. Torrance, CA 90501

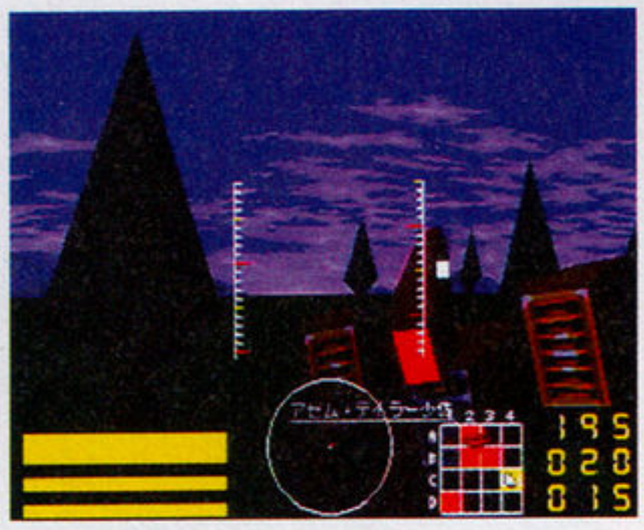
PC CD-ROM

ng alphas

Metal Jacket

Pony Canyon's contribution to the PlayStation's burgeoning software catalog is a strategic shoot 'em up that could prove to be an exhilarating experience

The robots are capable of some spectacular aerial maneuvers. Leap over your opponent, turn round 180° and blast him into atoms



Night fighting requires a different set of tactics. Sneak attacks are easy but stalking around leaves you vulnerable too

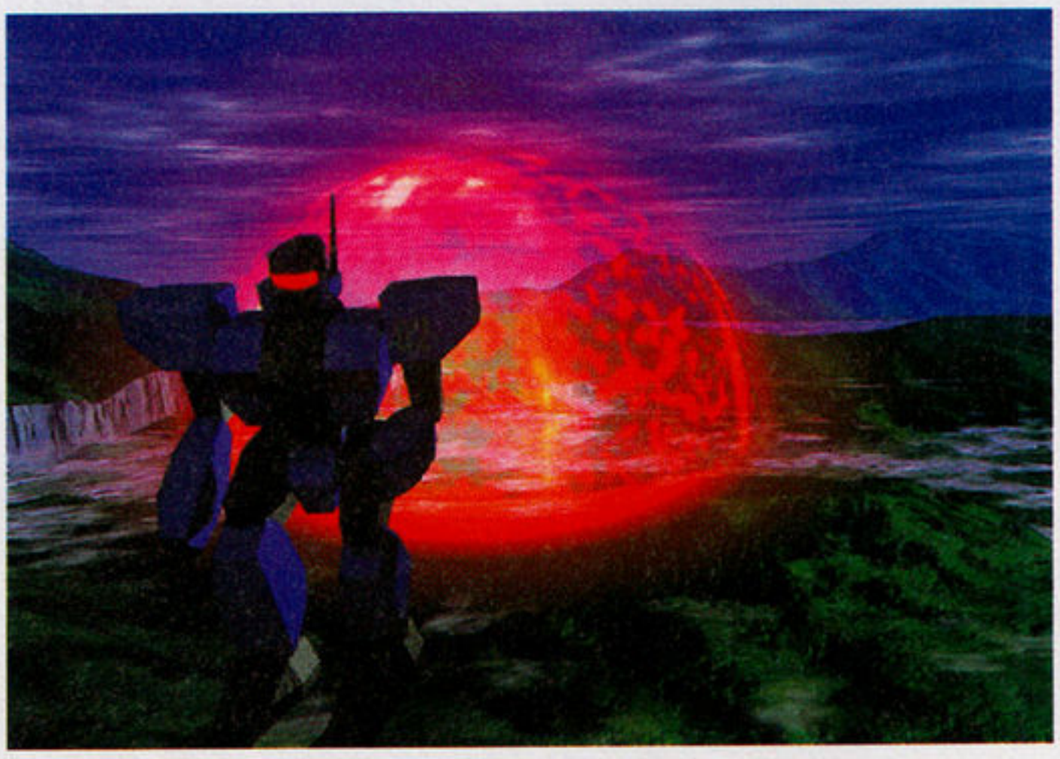
There are six combat zones, including a city, a forest and a desert, each with variable battle conditions

Format:	**PlayStation**
Publisher:	**Pony Canyon**
Developer:	**Pony Canyon**
Release date:	**April**
Size:	**1 CD-ROM**
Origin:	**Japan**

After the spectacular success of Namco's *Ridge Racer*, the second wave of PlayStation releases has some high graphic expectations to fulfill. One of the games aiming to win next-generation laurels is Pony Canyon's *Metal Jacket*.

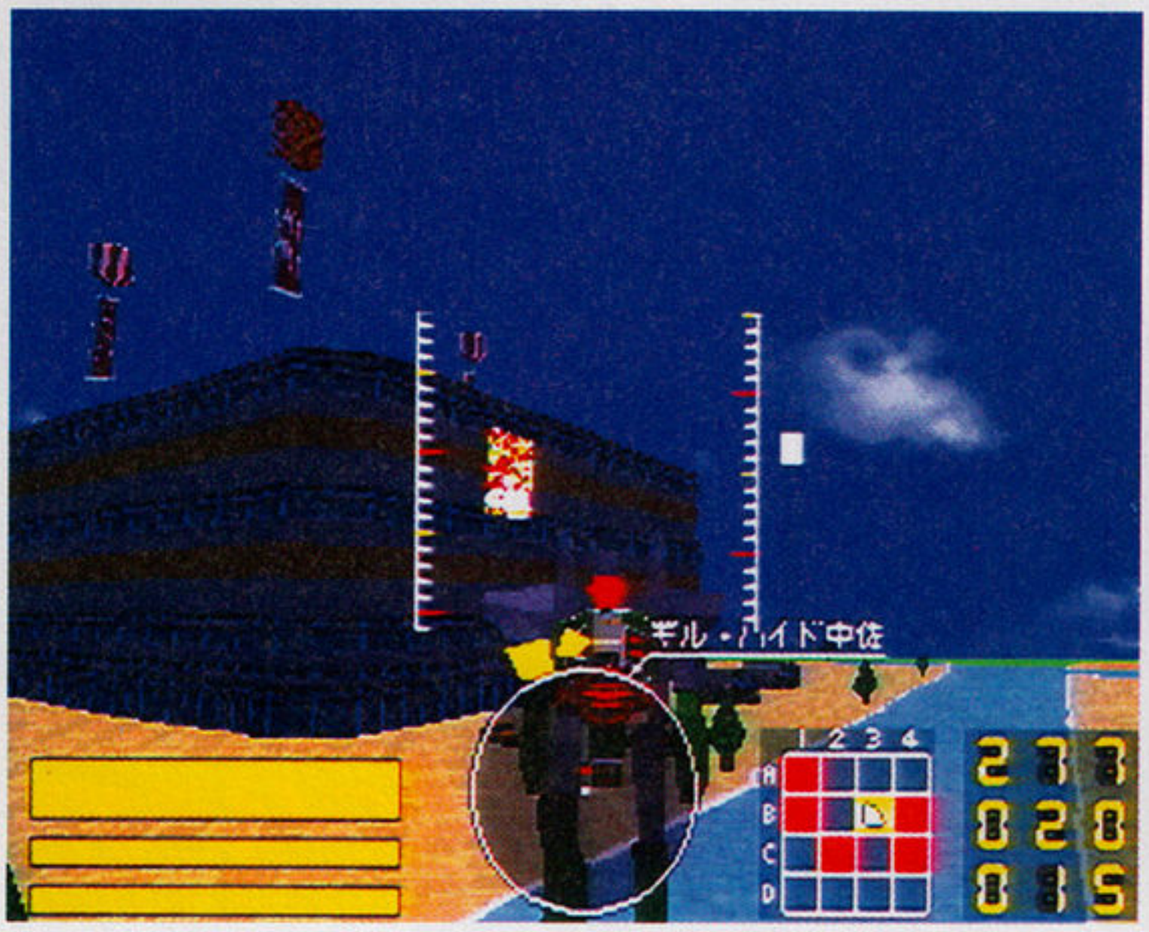
Metal Jacket is a tactical shoot 'em up in which the player takes control of a 20-foot-tall robot and does battle with seven other intelligent robots plus assorted static ground targets. At the start of each mission you choose either Survival Mode, an unadorned slugfest, or Mission Mode, where predefined goals have to be attained.

Each robot has unique strengths and weaknesses, and prebattle decisions affect the tactics used during the missions. For example, armor can be concentrated on the front if you plan to take a direct line to an enemy or to the

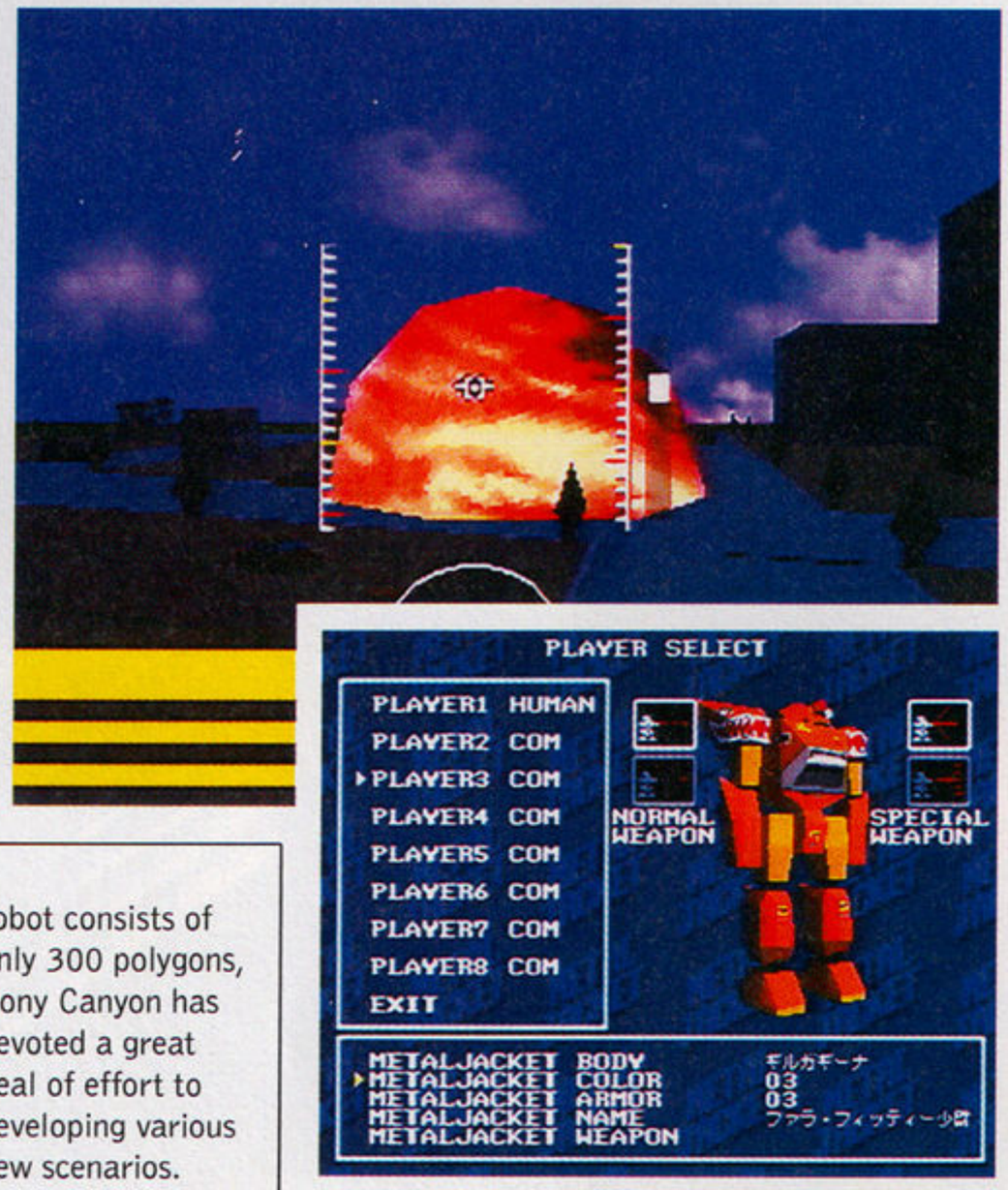


Prerendered sequences will be used intermittently in *Metal Jacket* to depict crucial events in full color. Here, a robot has a lucky escape

ng alphas



Fighting up to eight other robots at once can lead to some hectic action. The sights and displays offer you guidance, but ultimately it's down to you



An explosion consumes an enemy robot (top). All the mechs can be customized to suit individual tastes and tactics (above)

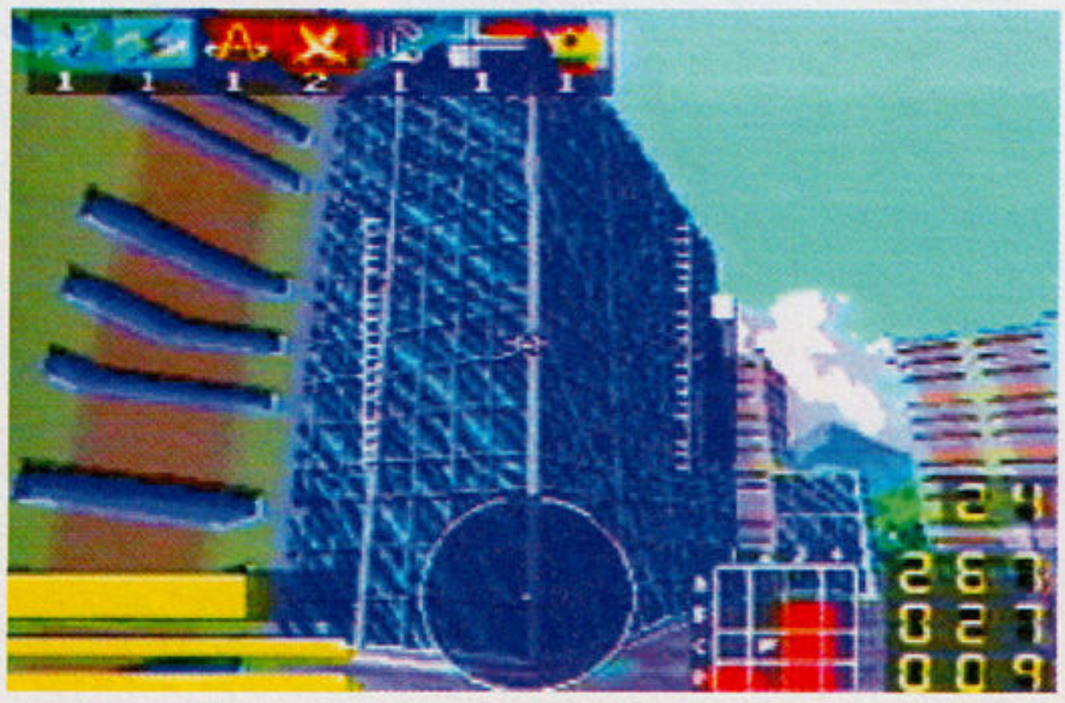
rear if you favor hit-and-run guerrilla methods. As a robot receives damage, its response times increase and gauges start to malfunction.

Pony Canyon's original plan was to concentrate its efforts on the game's graphics, but because of the small programming team (there are only two dedicated programmers on the project), and the fact that the power of the final hardware was unknown caused the gameplay to come around and became the central focus instead.

"Because the PlayStation is a new machine, we could not accurately judge hardware capabilities like the polygon limits, speed and sound," admits co-producer Seiji Toda.

Ironically, this lack of knowledge has proved to be a blessing. Although the game uses a mere 16 colors and each robot consists of only 300 polygons, Pony Canyon has devoted a great deal of effort to developing various new scenarios. Presently, there are six combat zones, including a city, a forest and a desert, and each has variable battle conditions.

"The game is generally around 60% complete but some elements are only 30% finished," says Masayoshi Yamamiya, *Metal Jacket*'s other coproducer. "We're working on the multiplayer facility in particular but are being hampered by Sony not releasing the connecting lead. The Japanese version will have a two-player option only. However, it is hoped that foreign versions will offer the full eight-player capability."



All these buildings (left) provide ideal cover. Your sights track a doomed robot (right). *Metal Jacket* was designed as a multiplayer game, and at the PlayStation's US release a link-up cable will be available to enable two-player challenges

BATTLEMORPH™ This much-anticipated 3-D sequel to Cybermorph has a killer new twist. You can seek out new worlds underwater and underground. Available 1st quarter.

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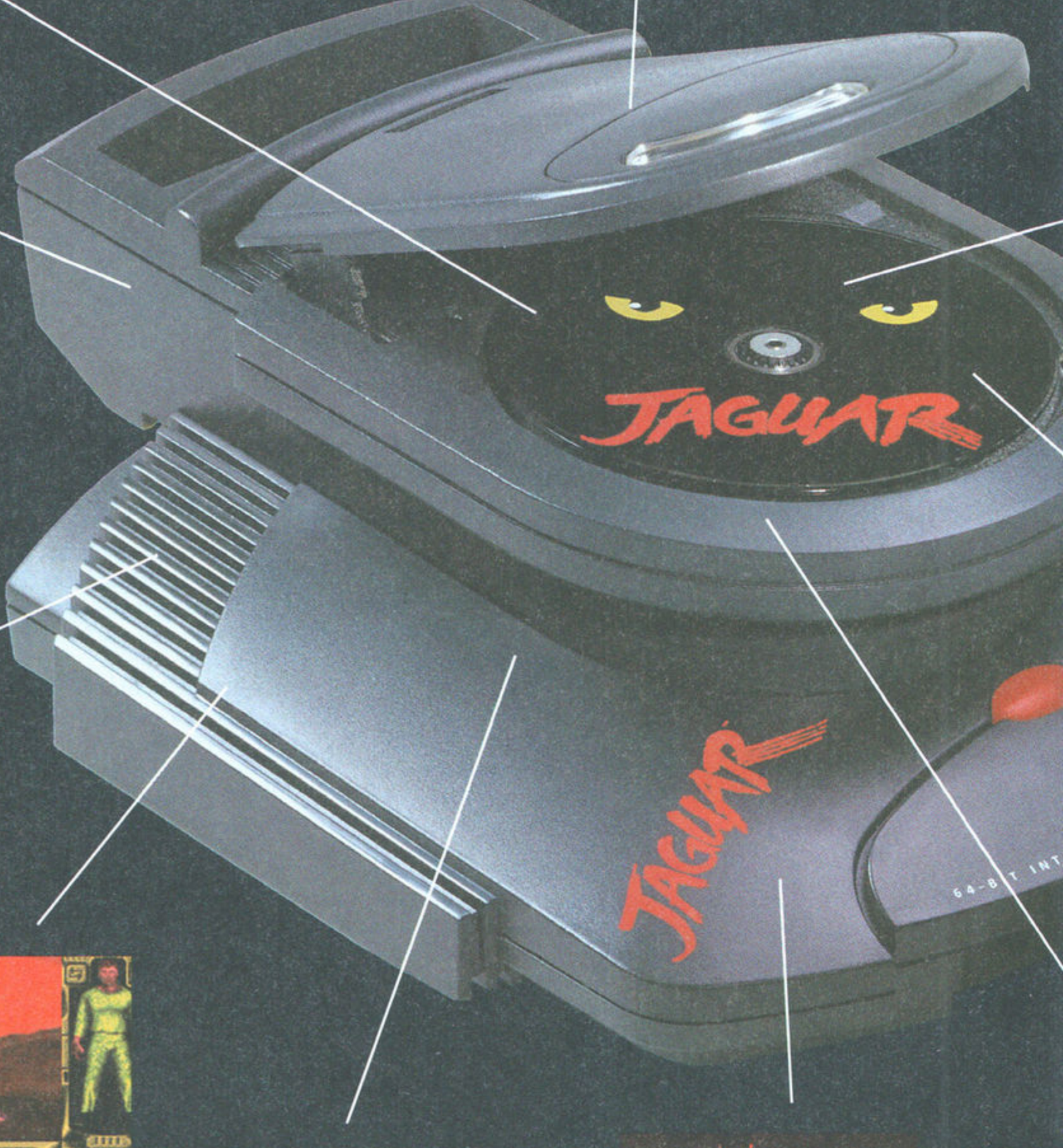
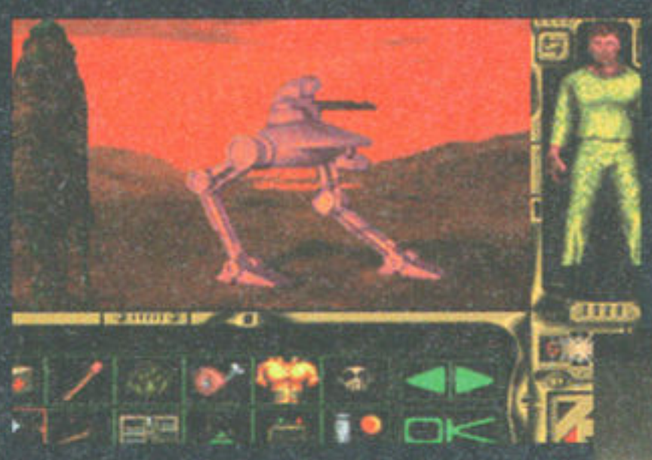
HIGHLANDER™ Based on the hit movies and TV series, Highlander will take your swordsmanship to the 64-bit level. Available 1st quarter.





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BLUE LIGHTNING™ You're in an F-18 battling a renegade general. Can you handle precision flying and stomach-wrenching dogfights or do you need your mother? Available 1st quarter.

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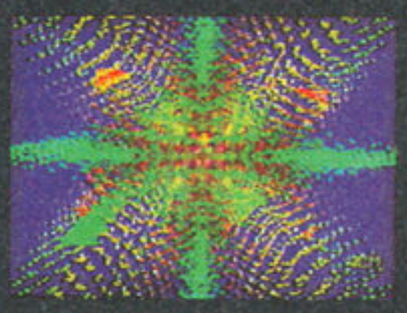


If our Interactive CD games don't rearrange your brain cells, the built-in Virtual Light Machine will. Throw on your favorite CD, and watch the music morph, contort, and pulsate in a psychedelic light show your ex-hippie parents may even appreciate. So check out the new CD player for the Jaguar. It'll crank the torque up to nuclear proportions.

$149

[CD player comes fully loaded with everything but a Jaguar.]

JAGUAR™ 64-BIT MULTIMEDIA PLAYER CD

DO+THE MATH

Motor Toon Grand Prix PlayStation **Virtua Fighter** Saturn **Return Fire** 3DO **Syndicate** Jaguar **Corpse Killer** 32X **Nascar Racing** PC **Flashback** Sega CD **NBA Jam Tournament Edition** Genesis **Ogre Battle** SNES

Your essential reviews guide to this month's game releases...

Once again, **NEXT Generation** has gathered the best (and the worst) titles available and combined them into a concise listing of what's available for your machine. Sony's PlayStation and Sega's Saturn make their debut here; look for the latest in Japanese titles here in the months to follow. Below is a list of what each rating signifies.

★★★★★ Revolutionary
Brilliantly conceived and flawlessly executed; a new high-water mark.

★★★★ Excellent
A high-quality and inventive new game. Either a step forward for an existing genre, or a successful attempt at creating a new one.

★★★ Good
A solid and competitive example of an established game style.

★★ Average
Perhaps competent; certainly uninspired.

★ Bad
Crucially flawed in design or application.

PlayStation

A Train

Publisher: S.C.E.
Developer: S.C.E.
Size: 1 CD-ROM
Release Date: Available now (Japan)

More for strategy fans than action buffs, *A Train* is best pigeonholed as *SimCity* on rails.

As governor of a small city's rail network (as well as the bus system), the manner in which you build and run the rail system directly affects the growth of the city surrounding it. Much of the game revolves around raising finances and juggling train fares. The bigger the city, the more fares you pull in, but conversely, the more money you have to spend on building — a catch 22 familiar to all *Sim* fans. Often there are geographic hurdles in your way, such as rivers to bridge, hills to raise the track over, or — more expensively — earth to tunnel into. You know the score.

Selecting icons and guiding screen pointers can be done with either the joypad or an optional mouse (available separately, or as part of the *A Train* Evolution pack; for about $30 you get the game, a Sony mouse, an *A Train* mouse mat and a memory card).

A Train has sold out in Japan, largely by virtue of the fact that it is one of the only PlayStation games available, but also because it's a quality management title. Unlikely to set the world aflame, however.
Rating: ★★★

Ridge Racer

Publisher: Namco
Developer: Namco
Size: 1 CD-ROM
Release Date: Available now (Japan)

While the jury may still be out in the *Ridge Racer* vs. *Daytona USA* battle for arcade supremacy, there's no disputing that as a home title, Namco has just scored a home run for the PlayStation. The addition of extra cars (a total of 13 now await perusal), the

Smooth animation and control make *Ridge Racer* one of the best racing games ever

bonus ability to race each course backward upon completion, and the inclusion of all arcade features (yes, that *Ridge Racer* sliiiiide is still an integral part of each corner) makes for a home classic.

The graphics really do have to be seen to be believed, and when you consider that this is effectively a last-minute rush job (Namco had just six months to learn the new hardware and complete the conversion!), it's a fantastic testament to the PlayStation's potential power. If this is Sony's equivalent of *Altered Beast* (which was the very first Genesis game), then the PlayStation's *Sonic The Hedgehog* will really be something special.

On the downside, it lacks a two-player mode. Due to time constraints, Namco was unable to squeeze the networking code into the final program — this will be rectified with *Ridge Racer 2*. Also, the cars really don't vary that much in feel or performance (there's certainly no comparison with the School Bus or Cop Car found in *Cruis'n USA*). But overall, a fine game. And an excellent harbinger of what's to come.
Rating: ★★★★

Toh Shin Den

Publisher: Takara
Developer: Tamsoft
Size: 1 CD-ROM
Release Date: Available now (Japan)

Toh Shin Den's visuals are simply gorgeous. On first impression that is. Whereas an appreciation for *Virtua Fighter*'s may grow with time, *Toh Shin Den*'s initial 'wow' factor is second to none. And where *Motor Toon Grand Prix* takes Gouraud shading to its gaudy extreme, *Toh Shin Den* employs graphical tricks in measured amounts; the result is impressive, yet easy on the eye.

After a while, however, the realization dawns that some reaction speed and move repertoire have been sacrificed in pursuit of its outstanding looks. That's not to say that *Toh Shin*

One of the most impressive graphic fighting games ever made, *Toh Shin Den*'s moves and plays are still somewhat sluggish

PlayStation

CLUNKY

Motor Toon Grand Prix

Publisher: Sony Computer Entertainment
Developer: Poly's New Generation Game Making Project
Size: 1 CD-ROM
Release Date: Available now (Japan)

Perhaps in an attempt to emulate Nintendo's (read Mr. Shigeru Miyamoto's) gift of breathing life into its game characters, Sony has eschewed the conventional racing game (a market already cornered by *Ridge Racer*) in favor of the wildly esoteric *Motor Toon Grand Prix*.

There are four race modes: Grand Prix, Time Attack, Match Race and Dual Race, the latter two only available as split-screen two-player, twin-joypad races. Grand Prix mode speaks for itself, and is *Motor Toon*'s main allure. Time Attack is an ingenious way of playing and bettering your own times: You race solo around one of the courses against the clock, then subsequently against a ghost-like doppelganger mimicking exactly the route and speed of your first race. In subsequent races, you compete against your fastest time. It's more addictive that it sounds.

The two-player modes are disappointing. The split screen is oddly claustrophobic, limiting the player's forward view, and both modes suffer from one major flaw: Players cannot choose the same car. Also, despite the wonderful visuals — the three main Grand Prix courses (Toon Island, Plastic Lake and Gulliver House) provide some genuinely breathtaking views — there really isn't much here: no secret routes, no jumps or bonuses, and nothing to add any much-needed depth to extend its life span.

In short, the odd foibles of *MTGP* and the unnatural way in which the cars handle means it falls well short of *Ridge Racer* in challenge and excitement. Ultimately disappointing.

Rating: ★★

***Motor Toon GP* is a great indicator of what Sony's machine can do**

The two-player mode is a welcome, but ultimately flawed addition — mainly due to the fact that it's oddly claustrophobic and players can't choose the same car

For all its good looks, Sega's *Clockwork Knight* is still just a glorified platform game for its newest hardware, Saturn

Den isn't an excellent game — it is a fantastic fighting game — just don't take it on face value.

In gameplaying terms, this fighter follows the well-worn template of previous fighting games, with the present and standard system of kick, punch, jump, crouch and convoluted special attacks — so there are no marks for originality there. But the action is in true 3D (you can roll 'toward' or 'away' in the third dimension), and the inclusion of weapons — while reminiscent of *Samurai Shodown* — gives the combatants real character.

The basic combat action is complemented and compounded by outstanding aesthetics, making it much more of an experience to play than the usual 2D fare, while the solidity and believability of the visuals adds enormously to the whole spectacle. In the final analysis, however, *Virtua Fighter* just wins by a hair. Sega's coin-op heritage has guaranteed a level of playability that the new contender can't quite match.

Rating: ★★★★

Saturn

Clockwork Knight

Publisher: Sega
Developer: Sega/AM2
Size: 1 CD-ROM
Release Date: Available now (Japan)

Reminiscent of John Lassater's award winning, computer-generated animation, *Clockwork Knight* is Saturn's clunky, first platform game. After a memorable two-minute animated introduction (set in a child's playroom, the sequence chronicles the events following a cuckoo clock striking midnight and the toys, predictably, coming to life), Pepperouchau — the wind-up hero — marches forth.

Both the boss characters and the game's scenery are purely dazzling. The bitmapped 3D obstacles in Pepperouchau's path convey a wonderful solidity as well as depth; the textured surfaces moving in unprecedented parallax, while wooden paneling boasts grain effects and kitchen fixtures flash shiny metallic finishes.

But, unfortunately, the gameplay is left lacking. For the most part, *Clockwork Knight*'s action is merely routine. It's also too easy: **NEXT Generation** completed the game on its default difficulty setting (labeled 'normal') at its first attempt in less than two hours.

There's no point buying next-generation hardware unless the software not only looks like cutting-edge 32bit material, but also plays better than its forebears. Sadly, *Clockwork Knight* fails on the latter count. So the wait is now on for *Clockwork Knight 2*, currently in production at Sega Japan.

Rating: ★★★

Tama

Publisher: Tengen
Developer: Tengen
Size: 1 CD-ROM
Release Date: Available now (Japan)

Tama is reminiscent of the SNES game *Cameltry*, and is — once the novelty value wears off — presumably destined for the same degree of obscurity. The objective

3DO

BLAST

Return Fire

Publisher: Prolific Publishing
Developer: Silent Software
Size: 1 CD-ROM
Release Date: Available now

This is cool. The concept is simple — think of capture the flag played with tanks and APC's — and superb bells and whistles that make this game simply excellent.

Each of the four vehicles you pilot has its own classical theme music in Dolby Surround: "Mars" from Holst's *The Planets* for the tank, Wagner's "Ride of the Valkyries" for the attack chopper and so on. When buildings are destroyed, they don't just explode, they crumble to the ground. There are little screams as you run over infantry. There's more than 100 maps to run around, and the scrolling and scaling are silky smooth.

In short, great stuff. It's a lot more fun as a two-player contest than a one-player game — even with a hundred maps, playing the computer gets old after a while. But there's so much real estate to destroy that this is a blast in any mode.

Rating: ★★★★

You can't go wrong with a tank. Bulldoze the enemy tent camp, then blast every building in sight (right). Where's that flag, where's that flag? (inset)

Here's the real deal though. While the split screen doesn't give you much of a view, this is still one of the hottest two-player contests you can find

is to roll a ball from one end of a maze to the other, by means of shifting the terrain (on three axes) rather than the ball.

As a showcase of what the Saturn can do with polygons and texture mapping, *Tama* is a triumph. But if the visuals pack a solid punch, the gameplay suffers a quick KO — the bottom line is that this electronic facsimile isn't fun as playing the real thing. Moving the 'table' is a tricky, fussy business and hence controlling the movement of the ball is a challenge more of patience than of either dexterity or quick thinking.

Unlikely to star big in Saturn's US line-up. And this is probably a Good Thing.

Rating: ★★

Virtua Fighter

Publisher: Sega
Developer: Sega/AM2
Size: 1 CD-ROM
Release: Available now (Japan)

Having been thoroughly profiled last month (**NG 3**), *Virtua Fighter* — the game that has become the yardstick of fighting game performance — finally receives a review score. Of course, the question on everyone's lips is 'which is better, Saturn's *Virtua Fighter* or PlayStation's *Toh Shin Den*?' But despite the titles' obvious similarities, **NEXT Generation** warns against making the tempting — but ultimately illogical — leap of judging the hardware on the basis of this one comparison. The fact is, both games excel differently.

The Saturn *Virtua Fighter* is, to all intents and purposes, the coin-op game brought home. And away from the arcade, under the harsh light of unhurried examination, its merits grow. There's depth here in spades. The three button interface is more than up to the job of providing each character with 20-move arsenals, the motion-capture generated animation adds a startling degree of realism and the game itself — a tried and trusted veteran of the arcades — has a classic's subtle balance, rhythm and pace.

What *Virtua Fighter* lacks in *Toh Shin Den*'s immediate graphical punch, it makes up for in grinding longevity. The game's learning curve is conservative with rewards, but ensures a strong and lasting appeal. *Virtua Fighter* demands serious respect.

Rating: ★★★★

Sega's *Virtua Fighter* for the Saturn is an almost perfect arcade translation

3DO

Crime Patrol

Publisher: American Laser Games
Developer: American Laser Games
Size: 1 CD-ROM
Release Date: Available now

And yet another shooting gallery like *Mad Dog McCree I & II* and *Who Shot Johnny Rock*.

If you actually shell out the bucks for A.L.G.'s light gun, this isn't too bad — without one you might as well not even bother. Of course, that still assumes you can keep from laughing at the terrible acting and shoot straight. The video does pack a few stunt-filled highlights as you progress in rank from Rookie to SWAT team. Car crashes, explosions, plus a go-go dancer or two make it somewhat entertaining. Personally, we'd rather rent *Commando* again.
Rating: ★★

Jammit

Publisher: Street Sports
Developer: GTE Interactive
Size: 1 CD-ROM
Release Date: Available now

More than a year ago, *Jammit* came out on SNES and Genesis, and now 3DO's version doesn't add any new wrinkles.

You compete in street ball against three other characters, Chill, Roxie and Slade, and make side bets on the outcome. The partly digitized graphics look fine, and the close-ups of the basket as

If you're hoping to sprint by your opponent, think again — *Jammit* isn't that fast

you break in for a dunk are sort of unique — in theory. In practice, they're kind of distracting.

In the end though, what kills this one is that the controls are so sluggish you'd think your Nikes had melted to the blacktop. Compared to, say, *NBA Jam*, this doesn't have a shot.
Rating: ★★

Novastorm

Publisher: Psygnosis
Developer: Psygnosis
Size: 1 CD-ROM
Release: Available now

This is the latest in a long and venerable line of shooters in which your ship is pasted onto the screen, effectively blocking you from seeing oncoming enemies, and leaving no shadow or any other clues as to how the ship relates to the background.

If it looks oddly familiar,

In *Novastorm*, while alien hordes bear down on the planet, your view is blocked by your own ship

that's because it bears a striking resemblance to Psygnosis' other shooter for 3DO, *Microcosm*. It shares that game's structure and even appears to use the same engine. *Microcosm* was bad enough, but *Novastorm* doesn't even have the advantage of a knockout intro — there are some nice cut scenes, not much else.
Rating: ★

Starblade

Publisher: Panasonic
Developer: Namco
Size: 1 CD-ROM
Release Date: Available now

Starblade is another in the *Rebel Assault/Lodestar* mold — a shooter in which you have no control over your ship, you just shoot at whatever flies by.

You've got the option of playing either 'classic' Starblade, which is all shaded polygons, or a new 3DO enhanced mode, which throws on texture maps. It's OK if you like this sort of thing. It's fast and furious, but also very, very short. Three stages and it's over.

If the game had held out longer it might have been rated higher, but as it is, there's just not enough there.
Rating: ★★

Jaguar

Theme Park

Publisher: Ocean
Developer: Bullfrog
Size: 4 MBs
Release Date: Available now

The second title from the Bullfrog PC archives, *Theme Park* has all the trappings of a *SimCity* within a big top atmosphere.

Players take their starting funds in the attempt to create a theme park (complete with roller coasters, log flumes, and shooting galleries) with the appeal and profitability to last through good and bad times. The conversion is seamless, and the Jaguar's 64bit graphics processor does an

Jaguar

FORMIDABLE

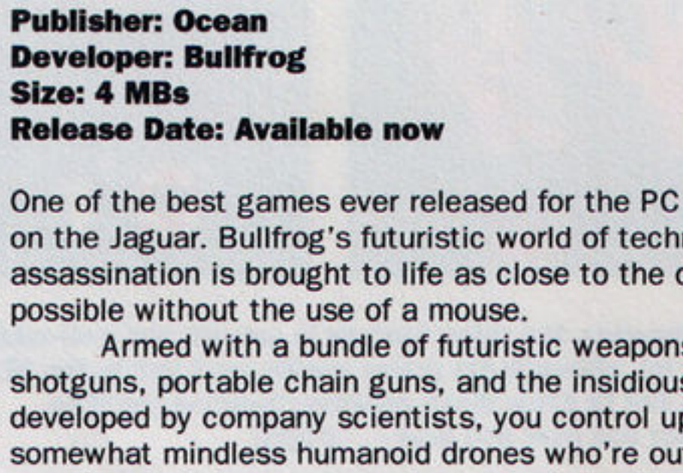
Syndicate

Publisher: Ocean
Developer: Bullfrog
Size: 4 MBs
Release Date: Available now

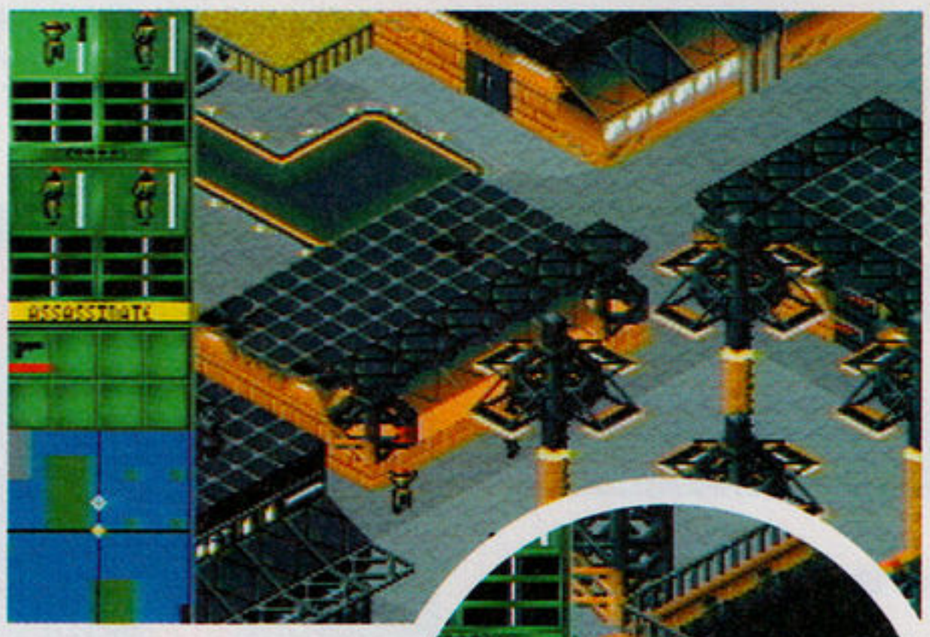
One of the best games ever released for the PC is now available on the Jaguar. Bullfrog's futuristic world of technocracy and assassination is brought to life as close to the original title as is possible without the use of a mouse.

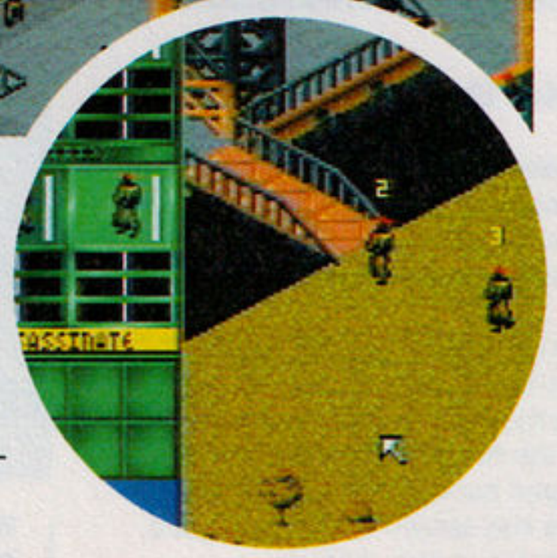
Armed with a bundle of futuristic weapons including shotguns, portable chain guns, and the insidious persuadertron developed by company scientists, you control up to four somewhat mindless humanoid drones who're out to kill their enemies. In between you and your goal stands an equally formidable team of enemy agents, guards, and even policemen attempting to keep peace in this brutal future.

Graphics are small and crisp, offering an easy to follow 3/4 view of the action. The detailed views of the violence, such as enemies flying backward as they are shot, or stumbling around afire after receiving a flamethrower blast are gory, but they add the perfect and final touch to the title's oppressive atmosphere. Definitely one of the best titles available for Atari's Jaguar.
Rating: ★★★★



Starting with Western Europe, your ultimate goal is to conquer, (surprise!) the entire world





While the angle is a little odd, once you get used to it, you'll be piloting around cities quickly (above). Multiple views allow you to send agents on separate missions (right)

rating 32X pc

32X CD

Filmed in South America, the video footage is smooth and well-acted (for a game, that is), although the grainy quality isn't lost in the 32X CD version (left). Get to know these zombies, because you'll be shooting them over and over and over . . . (right)

SHOOT IT!

Corpse Killer

Publisher: Digital Pictures
Developer: Digital Pictures
Size: 1 CD-ROM
Release Date: Available now

The first 32X CD is here, and if you have enough room on your power cord for three power supplies you can actually play the game. The exclusive FMV developers of *Night Trap* bring you the 'zombie shooting thrill' (heavy sarcasm here) of *Corpse Killer*. And what is the verdict? It's lousy. It's not the game that's so bad. *Corpse Killer* is a decent shooter with some great video footage and some extremely repetitive shooting.

What's awful is that you've filled every orifice on your Genesis and this is the best you can get. The only difference between the Sega CD and the 32X CD version is a miniscule improvement in the video, but the upgrade is so small that only an expert could notice. Put simply, don't shell out $200 for a Sega CD and $160 for a 32X, because all you're going to get is a hefty power bill.
Rating: ★

Use this map to get from boring mission to boring mission (notice the 32,768 simultaneous colors? Us neither!)

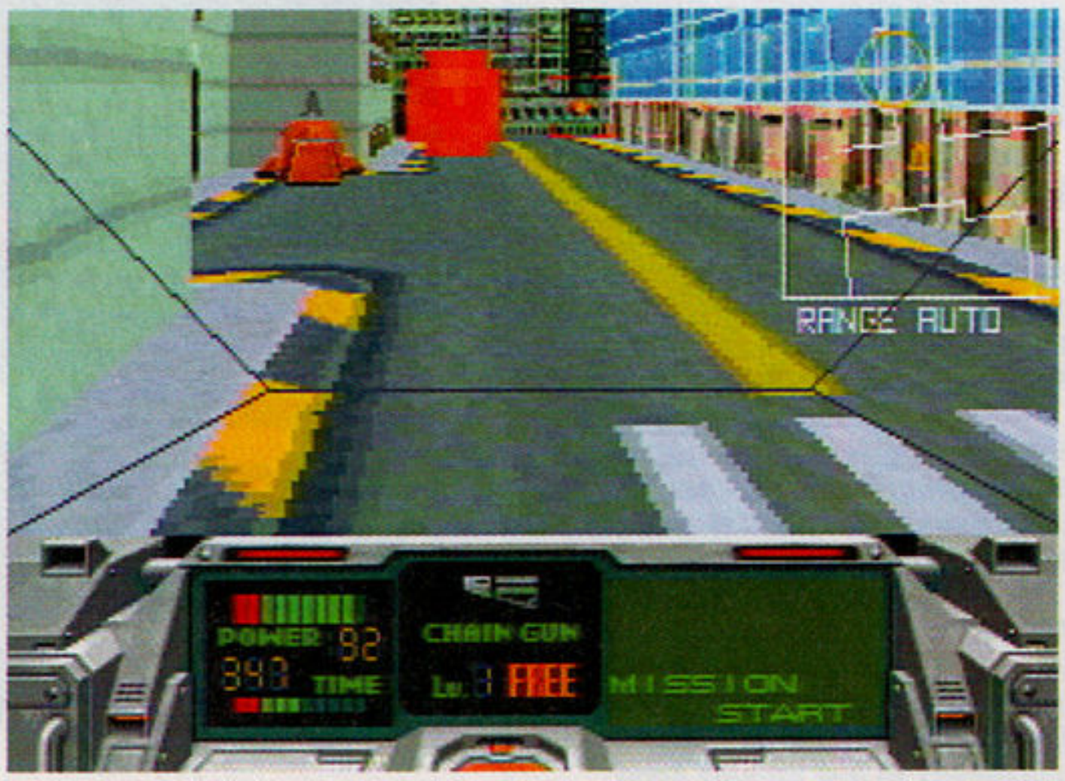
32X

Metal Head

Publisher: Sega
Developer: Sega
Size: 24 MBs
Release Date: Available now

Take control of a heavy metal robot and blast your way through the city, the suburbs, the farm, and the forest. While texture-mapped backgrounds and robots make the screen shots look good, decelerated play, glitchy explosions, and abysmal control make the game a much less valuable item than it looks.

Heavy metal 'muzak' and thundering explosions are aurally pleasing, but not enough to save *Metal Head* from being another poor 32X effort. The ability to change views is usually a nice option, but *Metal Head* even does this wrong. Add in slow drawing backgrounds and poor combat and you get the full *Metal Head* experience, blah!
Rating: ★★



The screens in *Metal Head* look good and optional views is a plus. if only the control worked better, this could be a decent shooter

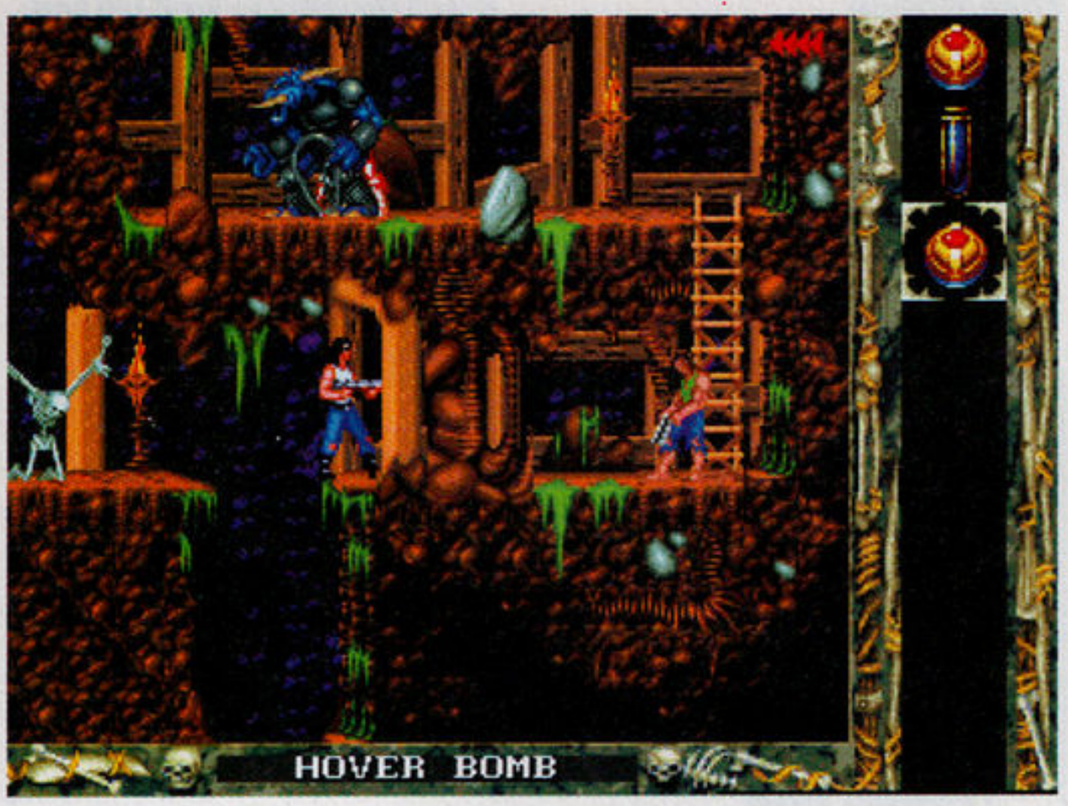
PC

Blackthorne

Publisher: Interplay
Developer: Blizzard
Size: 1 CD-ROM
Release Date: Available now

There haven't been many excellent platform games made for the PC. And despite typical excuses (bad controllers, poor scrolling, and lack of demand), titles like *Prince of Persia* have shown that not only are these games possible, they sell. With this in mind, Interplay ported one of its newest cartridge titles, *Blackthorne*, to the PC screen, skipping past all excuses to produce what is one of the best arcade-style games the machine has ever seen.

Like *P.O.P.*, *Blackthorne* is elegantly simple to learn and play. Each level the player will move Captain Blackthorne around a brilliantly detailed two-dimensional world, rescuing hostages, shooting bad guys, and collecting



One of the most difficult tasks in *Blackthorne* is trying to keep the innocents, one shown digging at far right, alive. A former innocent, far left

the goods he needs to avenge the rape of his homeworld.

Smooth animation and fantastic sound effects add to the dark feel of the game, turning what is already a superior title into an instant classic.

If you have been aching for some arcade action that's a step above the mindless shoot-'em-ups that seem to be around every corner, then this is certainly the game for you.

Rating: ★★★★

Creature Shock

Publisher: Virgin
Developer: Argonaut Software
Size: 2 CD-ROMs
Release Date: Available now

Virgin's *Creature Shock* is positive proof that a good game must consist of more than just flashy graphics and loud sound effects.

Fantastic rendered VGA graphics carry players through a world of brilliant enemies and installations where they get to either point their ships' guns at the objects and shoot them, or point their handgun at something and shoot it. Interactivity is at a low, the flaccid ship stages taking the art of videogaming back by about five years alone.

If the idea of a two-CD shooter that requires a 486 and 4 MBs of RAM to deliver a new version of *Afterburner* appeals, then you're in luck; otherwise, don't waste your time or resources here.

Rating: ★

Front Page Sports Baseball '94

Publisher: Sierra
Developer: Sierra
Size: 1 CD-ROM
Release Date: Available now

The best keeps on getting better in this latest version of Sierra's sports flagship.

Baseball fanatics can now take control of the game's every aspect, setting up conditions and players to match just about any game in history. Up to 48 teams in three different leagues can be created, using real players from today's lineups. Injuries, recovery time, weather conditions, and both amateur and free-agent draft options create an amazingly realistic approach to the management of baseball, while multiple camera angles, joystick and mouse controls, and crisp VGA graphics keep the arcade aspect of play fresh and exciting.

Crisp graphics and solid control interface confirms *Front Page Sports Baseball '94*'s place as the best diamond sim

This is a must for true fans of the game.

Rating: ★★★★

rating pc

Gazillionare

Publisher: Spectrum HoloByte
Developer: LavaMind
Size: 1 CD-ROM
Release Date: Available now

This strange trading game falls somewhere between EA's old *Psi-5 Trading Company, Spaceward Ho, and Lemonade* and looks much more like a grade schooler's first computer project than it does a fully completed mega-company release.

Players are to compete against up to 6 computer opponents (or 5 human ones) in a competition to see who can amass 1 million kubars first by trading all sorts of exotics on as many as 7 different planets.

Fairly good gameplay, but the graphics, sound, and interface of this product are so singularly simple and bland that the game has little more appeal than a text adventure. A great title for gaming purists or children.
Rating: ★★

There's not much to see in *Gazillionare*, but its simple appeal might draw strategy fans

Inferno

Publisher: Ocean
Developer: Digital Image Design
Size: 1 CD-ROM
Release Date: Available now

A strange new simulator that combines some truly bizarre animation scenes with a space sim in the style of *Firebird's Elite*.

In a standard man against alien storyline, players will get a chance to pilot a fully equipped spacecraft through 30 combat situations while trying to defeat a superior enemy. Although controls and equipment are truly inspired (eight weapons including three different laser and torpedo platforms, a cluster weapon, and the megadeath), the gameplay often has a tendency to be a little hard to follow.

Those with the patience to stick with it will find a unique gaming experience, but one that never fully achieves greatness.
Rating: ★★★

Looks good, but *Space Ace* suffers from the same binary gameplay as the original

Space Ace CD-ROM

Publisher: Readysoft
Developer: Epicenter Interactive/ Readysoft
Size: 1 CD-ROM
Release Date: Available now

Probably the second most obvious choice for conversion to the PC CD-ROM format (right after *Dragon's Lair*), Don Bluth's LaserDisc classic remains an entertaining cartoon attached to the antithesis of interactivity. Taking control of Ace, players must make it through every obstacle imaginable to rescue Kimberly (loud girlfriend) from the evil Commander Borf.

Requiring a surprising amount of power for what is in the end a very simple game (386 processor with 4 MBs of RAM and a double-speed CD-ROM drive), *Space Ace* does manage to come out looking and sounding almost exactly like the original arcade adventure, but in the end, that's not necessarily a good thing.
Rating: ★★

Star Crusader

Publisher: Gametek
Developer: Take Two
Size: 13 MBs
Release Date: Available now

Star Crusader is the perfect title for the *Wing Commander* fan who lacks the desire or power to run the series' new Hollywood-influenced effects. Take Two's newest title offers enough flash to hold players' attention, while remaining simple enough to run on most gamers' machines.

In addition to the game's 13 different textured-mapped ships, *Star Crusader* also features more than 100 different missions, a full 11-song soundtrack, and an energy control system very similar to the one in *X-Wing*.

Although there isn't much about the game that's very original (new weapons and ships in the familiar race against race struggle), *Star Crusader* is still a great sim for those who want great gameplay without the fluff.
Rating: ★★★

Star Reach

Publisher: Interplay
Developer: Techtonics
Size: 7 MBs
Release Date: Available now

Like the games *Star Control* and *Herzog Zwei* preceding it, *Star Reach* attempts to bring the best elements of arcade play and strategy together to reward players for some rational thought.

Unlike its predecessors though, *Reach* adds elements of world building to the mix with seven different structures and 10 different ship types that can be

PC

BLAZING

NASCAR Racing

Publisher: Virgin
Developer: Papyrus
Size: 1 CD-ROM
Release Date: Available now

The masters of automotive simulation once again created a title every serious PC gamer will want to buy. From the high-resolution 640x480 graphics to the powerful soundtrack (featuring one song created by two members of the heavy metal band Skid Row), everything about *NASCAR Racing* screams quality development.

NASCAR fans will want to take advantage of every aspect of the game's car personalization features (including car colors and decals, tires, fuel, suspension, and gear ratios). Those who are less serious about their racing will get hours of pleasure (as we did) out of watching the game's real world physics portray wrecks of truly epic proportion, and then watching them again from the game's extensive replay mode.

NASCAR Racing also includes an option for modem or direct connection for head-to-head competition to help you start really nasty fights over who was really responsible for that 20-car pileup.

While all of these options are great, it's the game's astounding ability to create a realistic feeling of speed that makes it an incredible hit. Flying around tracks at 170 mph and up will make you respect those drivers who do this for a living. Definitely a winner.
Rating: ★★★★

The standard roofing window offers a realistic point of view (top). Racing purists can touch up their car to reach the maximum in performance (above). For the really impressive wrecks, you can check out the action in the instant replay (inset)

produced at each conquered planet. Unfortunately, other than this small twist, there's not really much else here that's innovative or unique to the game.

Two-player mode pits two friends (or whatever) against each other in a fairly even match usually boiling down to who hits whom first. A good-looking revamp of an old theme.
Rating: ★★

While similar looking, the levels take advantage of *The Lemmings Chronicles'* new features

The Lemmings Chronicles

Publisher: Psygnosis
Developer: DMA Design
Size: 1 CD-ROM
Release Date: Available now

Although it sounds a good bit like a compilation disc, Psygnosis' *The Lemmings Chronicles* is, in reality, a set of 90 all-new levels featuring three of the most popular lemming races (Classic, Shadow, and Egyptian) from the previous title *Lemmings the Tribes.*

Although the basic idea is still to save the suicidal beasts, DMA has carefully avoided the "more of the same" trap by increasing the size of the lemmings, laying down some fantastic new backgrounds, and adding a host of features (skills such as suckers, hadoken, and grenade; weird new enemies, and advanced controls enabling players to quickly isolate individual lemming characters).

An excellent new perspective on an old stand-by.
Rating: ★★★

Transport Tycoon

Publisher: Microprose
Developer: Microprose
Size: 1 CD-ROM
Release Date: Available now

The best economic sim since *Civilization*, Microprose's new *Transport Tycoon* has all of the features of Sid Meier's *Railroad Tycoon* mixed with the look and ease of Maxis' *SimCity 2000* and a host of new features (control of automotive, rail, shipping, and even air transports) that give the game a feel that is all its own.

All action in the grid-mapped 3D world is displayed in vivid 640x480 256-color SVGA along with a pleasant soundtrack and sound effects. Cities and towns grow up realistically, creating a virtual world in which the player's decisions affect an alternate future. Addictive in the extreme...
Rating: ★★★★

Zeppelin

Publisher: Microprose
Developer: Ikarion
Size: 1 CD-ROM
Release Date: Available now

The weakest yet in the fleet of new economic sims Microprose has released this season. Players take responsibility for building an empire of airships that can stand the test of time by researching and building new aircraft, advertising in cities around the world, and crushing competitors.

Unfortunately, ho-hum 'old-timey' graphics and sound mixed with a complex and unnecessarily frustrating interface take what might have been a fresh, new period game, and turn it into an electronic alternative to *Sominex*.

A few extras like the two-player mode, stock market controls, and open air competitions add little spice to what ends up being very bland fare.
Rating: ★★

Sega CD

Pitfall: The Mayan Adventure

Publisher: Activision
Developer: Red Line
Size: 1 CD-ROM
Release Date: Available now

Pitfall was a mild disappointment when it debuted on the SNES and Genesis some months ago (see **NG 1**), and the Sega CD version is more of the same.

Added are three additional stages, for a total of 13, and the (ahem) music is better. There's also a 'digital video introduction' — read: "We've taken some footage from TV commercials and thrown it on the disk."

The most impressive feature of the CD is an especially snappy surround-sound mix, composed of audio recorded in an actual South

Sega CD

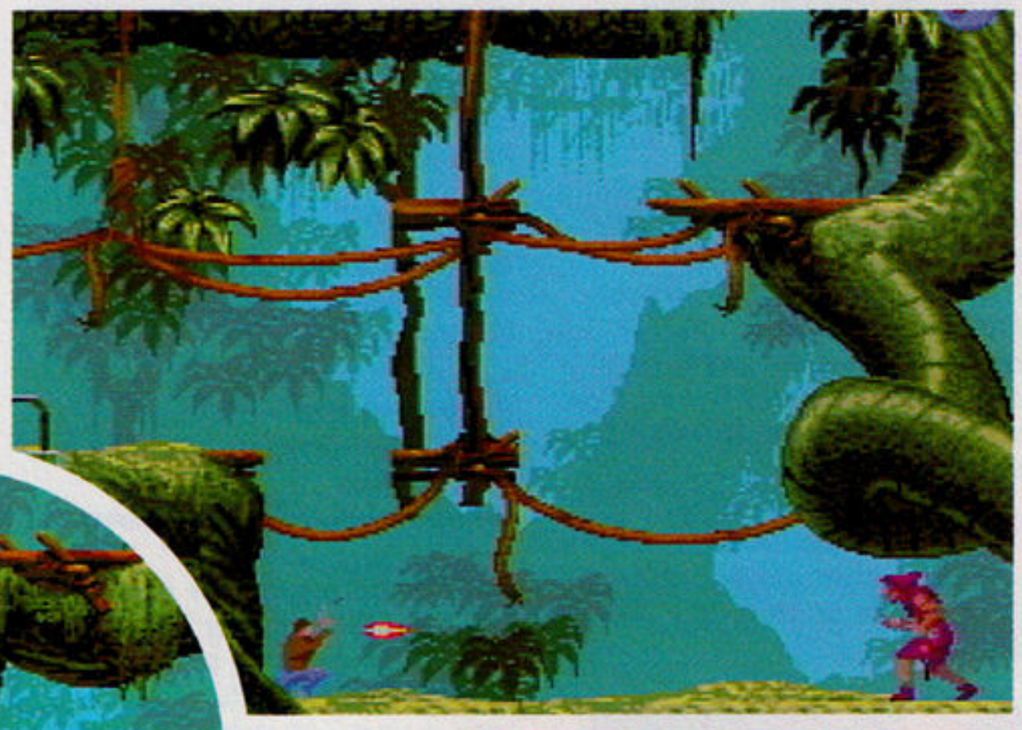
NATURAL

Flashback

Publisher: U.S. Gold
Developer: Delphine
Size: 1 CD-ROM
Release Date: Available now

Flashback for SNES and Genesis combined action and strategy extremely well. Although it resembles *Out of this World* and *Heart of the Alien*, and it's even from the same developer, *Flashback* is an unrelated game in a class by itself that easily surpasses them. The Sega CD version adds better music, speech, and a few rendered cut scenes (does anyone sense a trend?), but the action and layout of the levels remain the same any other version.

Each of the game's seven missions are fiendishly clever puzzles, and the graphics are a joy in themselves. The game's controls are, as ever, almost mind-numbingly complicated, not to mention requiring a fairly steep learning curve. However, the rotoscoped character movements are silky smooth, and once you get the hang of things, it looks and feels so natural you'll think you're there. Great stuff.
Rating: ★★★



With gun drawn, get ready to run, jump, and roll your way through some of the prettiest jungles of the last two years (left)

The CD-ROM version adds some rendered cut scenes, but the game play is the same (top and above)

rating genesis

American jungle, but that's a small improvement. The game is not bad, just not great.
Rating: ★★

Shadow of the Beast II

Publisher: Psygnosis
Developer: Digital Developments
Size: 1 CD-ROM
Release Date: Available now

The original *Shadow of the Beast* attained a certain cult status on the Amiga almost five years ago — and the following year, so did its sequel. There's a lot of strategy involved in those games, and the title is as much RPG as action, but there's been a lot of water under the bridge since these games originally appeared.

Even though the designers tried to spruce it up by adding better music, digitized speech, and a few rendered cut scenes, it still doesn't help much considering the game's overall stilted animation and poor control. Too little, too late.
Rating: ★

Space Ace

Publisher: Ready Soft
Developer: Epicenter Interactive
Size: 1 CD-ROM
Release Date: Available now

Space Ace, along with *Dragon's Lair*, were the first two seminal laser-disk based 'watch the video, push a button' games. Now this 10-year-old title resurrects like a ghost for CD-ROM.

These games were designed to suck quarters from the unwary gamer who's attracted by the video. The only way to beat any of the game's 13 stages is to play through it over and over until your reactions are automatic. You could surely train a monkey to do the same thing.

Worst of all, the cartoon that makes up *Space Ace* is more juvenile than most, and not even worth seeing on its own.
Rating: ★★

Reduced to his adolescent self by the 'Infanto-Ray,' Ace finds he has to play his own game

Genesis

Beyond Oasis

Publisher: Sega
Developer: Sega
Size: 16 MBs
Release Date: Available now

It's an RPG — wait, no it's an action game — oh hell, it's both. *Beyond Oasis* combines the free-moving, interacting world of an RPG with the button-mashing combat of an action game, and the result is an equally average effort on both parts.

As Prince Ali, you head out to find and destroy the evil Agito. Along the way, you must search the land for clues, magic,

***Beyond Oasis* is peppered with bland graphics and inane enemies**

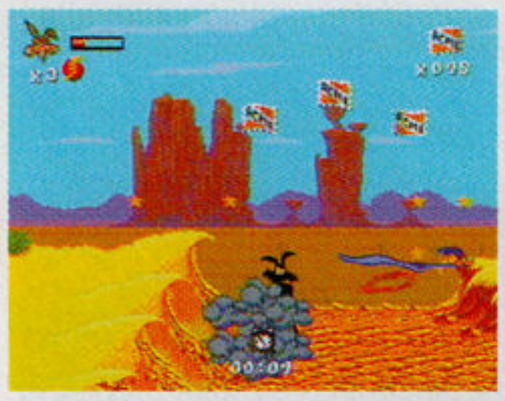
weapons and evil. The use of magic, whether it be the fireball or meteor storm; a user-friendly interface, and an ever-ready map put *Beyond Oasis* beyond others of its type. But ultimately, poor fighting and an uninspired storyline leave this title looking more like a mirage.
Rating: ★★

Desert Demolition: Starring Road Runner & Wile E. Coyote

Publisher: Sega
Developer: Sega
Size: 8 MBs
Release Date: Available now

This game captures the humor and feel of the Warner Brothers' classic like no other game.

As the Road Runner, your task is to speed away from the fiendish Wile E. Coyote while stopping for a pile of bird seed to replenish energy. But the real fun in this game is playing as Wile E. Coyote. Finally, you can help the poor, bumbling coyote catch that vile, feathered creature. Launch from a cannon, use an umbrella to slow your fall, or dig into the famous Acme goody box (with bird suit, springs or rocket-powered skates), in an effort to track down that annoying bird.



Done in by your own contraptions in typical Wile E. Coyote tradition makes for good fun

The incredible animation and perfect sound effects make this game a treat to play or watch, it's just too bad the six levels are so short and easy. Still a renter.
Rating: ★★★

Ecco Jr.

Publisher: Sega
Developer: Sega
Size: 8 MBs
Release Date: Available now

Apparently Ecco has been doing a bit more than saving the underwater world from the evil Vortex. That's right, *Ecco Jr.* is here to keep your kids just as bored as you were when you played *Ecco* Sr...

To *Ecco Jr*'s credit, it has some beautiful graphics and simplistic gameplay that'll be an easy play for the youngest of gamers. However, this game is nothing more than a way for Sega to dig its claws into the impressionable minds of young children and make them believe they need to graduate to the first (and more original) *Ecco*.

Let your young ones learn to read and write before you let them get caught in this tuna net.
Rating: ★★

NBA Action '95: Starring David Robinson

Publisher: Sega
Developer: Sega
Size: 16 MBs
Release Date: Available now

Trying to play on the same court as EA's best hoops effort yet (*NBA Live '95*) isn't easy, but Sega's willing to give it a shot. *NBA Action* has all the features: complete rosters, all 27 teams, full season, playoffs, finals, and a trade option. Plus, they have the commentary of frequent Letterman guest (oh, and hoops announcer) Marv Albert.

But it's not enough. The overhead view is great for passing and defense, but you lose the in-your-face action of the 3/4 view of *NBA Live*. Plus the small players and generic animation leave this game more than just a bucket short of the playoffs. We're talking Timberwolves (*NBA Action '95*) vs. Magic (*NBA Live '95*) — no contest!
Rating: ★★

Road Rash 3

Publisher: Electronic Arts
Developer: Electronic Arts
Size: 16 MBs
Release Date: Available now

Yet another installment in the popular motorcycle-riding-chain-over-the-head action of EA's *Road Rash* series. However, *Road Rash 3* is more than just an update. It's the first 16bit game to borrow from a 32bit game.

The Genesis cart takes all the new biker animation and track layout from the highly successful (and very impressive) 3DO version. Add to that superb new tracks in Australia and England, a

Biker animation's from the 3DO version give this 'three-quel' life. But chains, cattle prods, and crowbars are what makes it *Road Rash*

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Virgin

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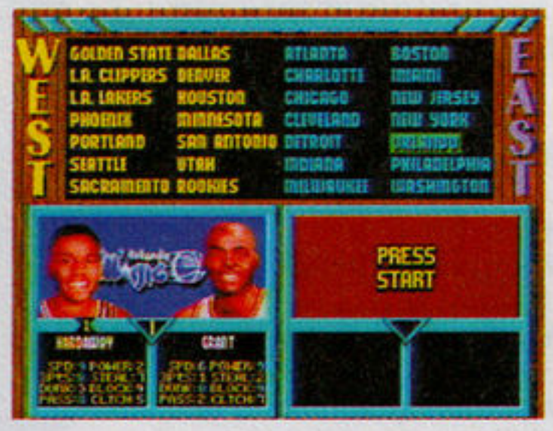


"Get that outta here!" With a multitap, friends can pair-up and talk trash, just like the pro's (left)

Rookies like Eric Montross get to defy gravity and any kind of realism by flying into the rafters (top). Updated rosters include Shaq and Horace on the Magic are vital in sims, but *Jam* is no sim (left)

DOUBLE DRIBBLE

NBA Jam Tournament Edition

Publisher: Acclaim
Developer: Acclaim
Size: 24 MBs
Release Date: Available now

One of the biggest quarter munchers of the year is coming home to the Genesis. And while the arcade *NBA Jam T.E.* pulled in trucks full of change for updated rosters and new hidden hoopers, the home version isn't going for a quarter (closer to $67 and a quarter).

Basically *NBA Jam T.E.* is the same two-on-two high-flying action as the original with a few additions that do everything but enhance gameplay. *NBA Jam T.E.* has updated rosters, new power-ups, player substitutions, injuries, a rookie team, new dunks, increased voice samples, and bigger players.

What does all this equal? Same game (albeit a good one), new package! Only *Jam* fanatics and the two guys who don't own the original need slam down the cash for this rehash.

Rating: ★★★

bike enhancer mode (where you can tweak bikes rather than shelling out more cash for a whole new one), and two new weapons — including the sure-to-be-popular cattle prod. And you have the best 16bit *Road Rash* to date, and that's saying something.

Rating: ★★★

The Adventures Of Batman and Robin

Publisher: Sega
Developer: Sega
Size: 16 MBs
Release Date: Available now

On the heels (squish!) of Konami's solid SNES version from the hit TV show comes this mockery of a game. Sega bought the license, then totally ignored it as they made an extremely generic side-scroller without the look or feel of the TV show. Unless, of course, you remember the episode where Batman ran from left to right throwing thousands of bat-a-rangs

Batman and Robin, running left-to-right, throw at everything in sight. This game has it all...

at everything in sight while the techno soundtrack blared away.

The inclusion of Robin and a two-player mode, where you and a friend can be the dynamic duo, give you more ways to not enjoy the game. While bosses like Mr. Freeze, The Joker, and Mad Hatter simply aren't enough to keep you playing for longer than 10 minutes. We'll give it a star for including the boy wonder, and that's cause we're nice.

Rating: ★

World Series Baseball '95

Publisher: Sega
Developer: Sega
Size: 24 MBs
Release Date: Available now

The major league players may be on strike, but their animated counterparts don't care about salary caps and will play for anybody willing to dish out for the license. One such party is Sega, who puts out its second baseball title *World Series Baseball '95*.

The first *WSB* was the best baseball game of '94 and the '95 version looks even better. With all 28 stadiums, up-to-date rosters, full season, playoffs, world series, trading, drafting, all-time greats, and an all-star game based on players performances from the season you play, *WSB '95* looks and plays great. The multiplayer leagues addition is just one more feature that should keep *WSB '95* at the top of the baseball line-up.

Rating: ★★★★

X-Men 2: Clone Wars

Publisher: Sega
Developer: Sega
Size: 16 MBs
Release Date: Available now

In this sequel to the megahit Genesis title, the X-Men are forced to do battle against a band of DNA pirates in order to save the X-Men Universe.

X-Men 2: Clone Wars boasts the most playable number of X-Men ever. You scratch and claw your way through 12 plus levels as Beast, Cyclops, Nightcrawler, Gambit, Psylocke, Wolverine, and for the first time ever...as the arch-villain Magneto.

The SNES version includes more complex moves and features more levels bettering the Genesis version. It's still left-to-right running and jumping, but with larger characters and a few twists (like avoiding electrocution while trying to unlock sealed doors), *X-Men 2* is worth a rent.

Rating: ★★

rating snes

SNES

Bassin's Black Bass

Publisher: Hot B
Developer: Starfish
Size: 16 Mbit
Release Date: Available now

Hot B seems determined to carve out its little niche — this is its third SNES fishing game in as many years, not counting the Genesis and Game Boy versions. However, it's fair to say the company has it down to a pure science.

This time you compete in three fishing tournaments, then move on to the Bassin' World Championship. The whole fishing experience is here, from the wide selection of lures to snags in the line, and you even have to worry about fatigue.

It's a mighty nice looking game, too, and comes close to the real thing — just don't forget to bring your own beer.
Rating: ★★★

The Flintstones

Publisher: Ocean of America
Developer: Ocean
Size: 16 Mbit
Release Date: Available now

Games from movie licenses generally tend to suck, but this one stays above the pack.

For the most part, it's still a side-scrolling action game. A

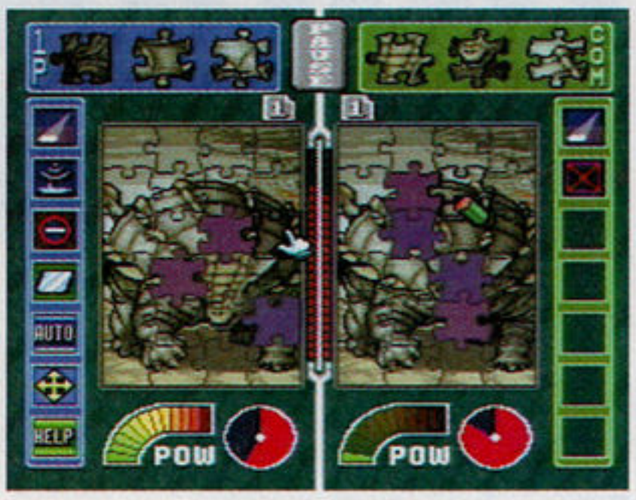
Remember in *The Flintstones* when Fred ran from left to right, hurling bowling balls at enemies?

distinctly John Goodman-looking Fred runs from left to right, throwing rocks at dinosaurs and bashes lesser-evolved Neanderthals with a club. But the levels are fairly well-designed, and there's a neat bit toward the end of the game where Barney runs around a coliseum that, courtesy of Mode Seven scaling, plays a little like *Mario Kart* without the karts. The game (as the movie) could've used more innovation, but it looks good, and plays well.
Rating: ★★★

Pieces

Publisher: Atlus
Developer: Hori Electric Co.
Size: 8 Mbit
Release Date: Available now

This is a puzzle game that's, well, all about puzzles — little jigsaw puzzles. The idea is to pop in all your pieces before your opponent,



At its heart, *Pieces* is all about the tough, harsh and highly competitive world of jigsaw puzzles

who's either computer controlled, or as many as four friends using a four-player adapter.

There are over a hundred puzzles to solve, although some seem to come up more than others. It's semifast, and, as with *Mean Bean Machine* or *Dr. Mario*, popping in enough pieces causes havoc in your opponent's puzzle (oh, sweet revenge).

Although it doesn't touch, say, *Super Bomberman* in the party game category, this title is still its own sort of blast.
Rating: ★★★

Pinball Fantasies

Publisher: GameTek
Developer: Spidersoft
Size: 8 Mbit
Release Date: Available now

Pinball Fantasies — a total of four pinball machines in one — was a cool package when it hit the PC seven months ago.

The machines vary a bit in quality — Party Land and Stones and Bones are fun, while Billion Dollar Game Show is a complete yawner — but on SNES you can see less than half the table at a time, and the tables don't scroll fast enough to keep up. Since a lot of the scoring devices are near the top of the table, it means that most of the time you're shooting blind. Not as good as expected.
Rating: ★★

In *Power Instinct*, there are a couple of characters you might not have seen before, but while it looks good and plays well, there's nothing new here

Power Instinct

Publisher: Atlus
Developer: Atlus
Size: 20 Mbit
Release Date: Available now

It's comforting to know *Power Instinct* has little new to offer — with so many frighteningly innovative and realistic next-gen games coming down the pipe, one more would have sent us over the edge, screaming into the night on sensory overload. So, it's good to find a game with average graphics, decent play control, and moves you've mostly seen before.

A character called Grandma who throws her dentures is good for a laugh, and there's an intimidating fighter called Angela who looks like a female Zangief, but otherwise, not much new, interesting or different. Nothing wrong here, it's just typical.
Rating: ★★

Tetris & Dr. Mario

Publisher: Nintendo of America
Developer: Nintendo of America
Size: 4 Mbit
Release Date: Available now

***Tetris* and *Dr. Mario* are classic games (*Tetris* is anyway), but do you need to buy them again?**

This cart's biggest significance is that it marks the first appearance of *Tetris* on SNES.

Nintendo's *Dr. Mario*, for those who don't remember, is a *Tetris* rip-off in which you line up multicolored capsules. To package both games on one cartridge takes a lot of cajones, if only because it invites direct comparison between the two (and take a wild guess which is a simpler, more satisfying game).

The cart also enables two players to square off, playing either *Tetris, Dr. Mario*, or an alternating series of both games. Yeah, it's great, but chances are you own a copy of one or both of these games already.
Rating: ★★★★

The Ignition Factor

Publisher: Jaleco
Developer: Jaleco
Size: 8 Mbit
Release Date: Available now

We'll give this one an extra point for original concept — hey, everyone wants to be a fireman when they grow up, right?

The Ignition Factor is an action game with strategy elements that asks you to put aside self-preservation instincts and race into burning buildings, putting out fires and saving victims. There's eight different blazes in all, including a steel mill and a chemical plant. The 3/4-view perspective is mildly unusual, and the media circus outside after the fire is out is certainly good for a chuckle or two.

The game is fast and furious, but it's over fairly quick, too. A few more levels might have put this over the edge.
Rating: ★★★

SNES

STRATEGIC

Ogre Battle

Publisher: Enix
Developer: Quest
Size: 12 Mbit
Release Date: Available now

Ogre Battle follows a trend beginning with *Shining Force* and continuing with *Dark Wizard*: This is an RPG with battles between armies rather than individual heroes. This time, you're leading rebel forces against the legions of the evil Empress Endora.

It starts with an *Ultima*-style questionnaire to determine what sort of a hero you are, and there are multiple branching storylines depending on how great a general you become. It's not great looking, but while graphics are simple, they're crystal clear, and there's no trouble keeping track of battle status. In addition, the music is excellent, the interface is smooth and easy to learn and use, and above all, the game play poses a serious strategic challenge.

There are 25 stages, each one brimming with towns to liberate, plus a lot of adventuring in between. It all adds up to one sweet package.

Rating: ★★★★

It begins with an *Ultima*-style personality quiz. Although it's never made clear exactly how the outcome affects the game, there are a number of branching storylines, so be careful how you answer

It doesn't look like much, but like a game of simple chess, *Ogre Battle* almost guarantees hours and hours of strategy and challenge (inset). Throughout the game, you have to be careful with whom you choose to battle, and how you treat the vanquished (right)

The Ren and Stimpy Show: Time Warp

Publisher: T•HQ
Developer: Sculptured Software
Size: 10 Mbit
Release Date: Available now

Poor Ren and Stimpy. When Nickelodeon fired creator John Kricfalusi, the heart and soul were sucked out of the pair. This game puts the final nail in their coffin.

The graphics are OK, and Stimpy's "Warf!" as he attacks with hairballs is suitably nauseating, but through the game's 10 stages, the designers subscribe to the 'throw lots of little stuff at 'em' school of gameplay. From the very first level, you spend half the time chasing down flies and such, making the action more frustrating than challenging. Character control is also just short of awful. Ick.

Rating: ★

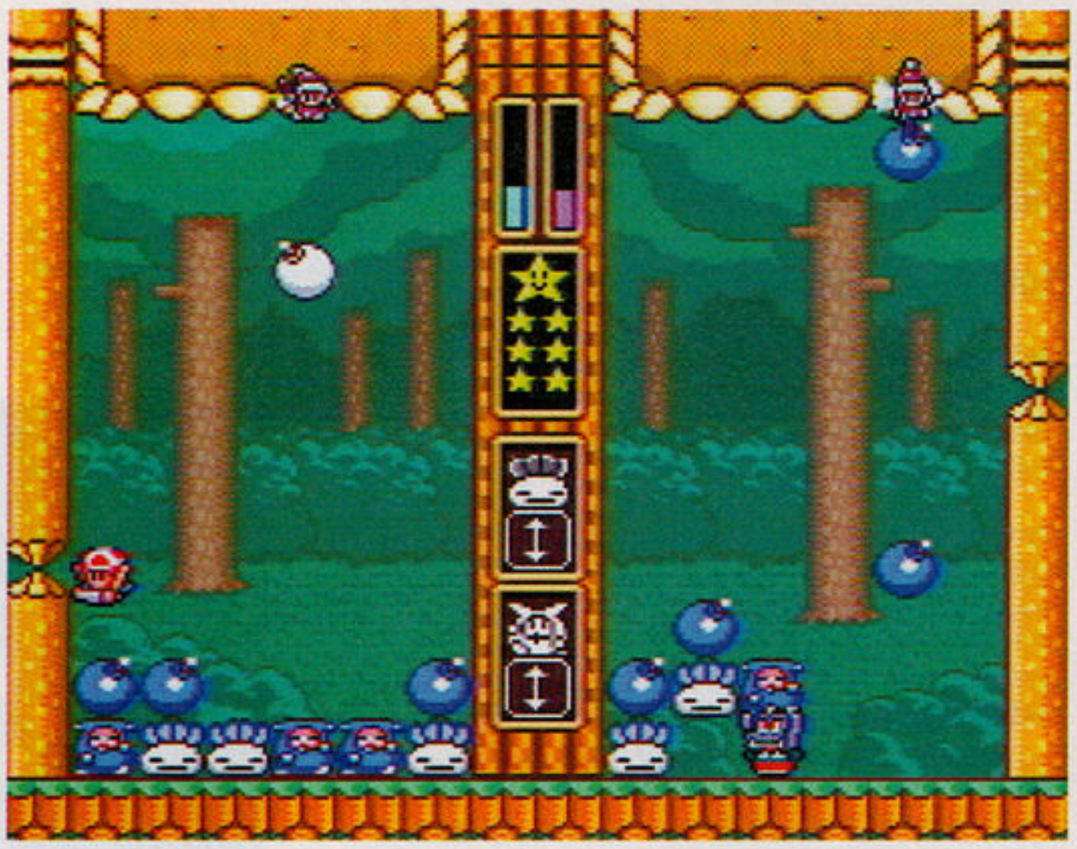
Wario's Woods

Publisher: Nintendo of America
Developer: Nintendo of Japan
Size: 8 Mbit
Release Date: Available now

This is the latest *Tetris* clone from Nintendo, and this time, instead of capsules, you're trying to line up bombs and destroy mutant creatures. The trouble is, this style of game needs to be kept very simple, but *Wario's Woods* is frustratingly complicated.

You can kick bombs and creatures, pick up a single bomb or creature, or a whole stack, or pop to the top of a stack if you get trapped underneath, and you can control how fast the bombs fall. Plus, you can line items up horizontally, vertically and diagonally. After a while you can become interested, but the learning curve is just too steep, the rewards too slim.

Rating: ★★



Toad, the Mushroom King from the Mario games, finally gets to star in his own title, except he's not in the title — bummer, especially since *Wario's Woods* ain't the greatest *Tetris* clone ever

Arcade

X-TRAORDINARY

X-Men: Children of the Atom

Publisher: Capcom
Developer: Capcom
Size: Two-player standup
Release Date: Available now

Coming off the *Street Fighter* high, Capcom has looked for ways to bring new life to the animated fighting game genre. Expanding on the lucrative X-men license, the company has managed to add a host of new characters and special moves that turn a solid interface into a really enjoyable game.

Players can choose from eight different characters straight from the best-selling comic book, including both good guys (Cyclops, Storm, Wolverine, Psylocke, and Colossus), and bad (Spiral, Silver Samurai, and Omega Red). New features include a power bar reading which special moves players can use at a given time, a character-unique super attack unleashing the nastiest attack that character is capable of, and combo counts similar to *Killer Instinct*. The entire game is filled with fantastic animation and graphics, along with excellent speech and sound effects recorded by the same actors who work on the Saturday morning TV show "X-Men: The Animated Series".

Extras aside though, this is still just a meat and potatoes fighting game, no better or worse than several others currently in the arcades.

Rating: ★★★

The final enemy of the game, Magneto, has access to awesome powers to both protect him and damage you (left). Players can chose to take on the X-Men in the form of one of the team's many foes (inset)

Juggernaut, the game's first boss, is a mountain of raw force. Be wary of his charging attacks (left). Colossus is low on special moves, but superior defense and raw power make him hard to beat (right)

Arcade

Tattoo Assassins

Publisher: Data East
Developer: Data East
Size: Two-player standup
Release Date: Available now

Tattoo Assassins is a very weird fighting game that attempts to follow in the footsteps of *Mortal Kombat* with the somewhat questionable new pull of, well, tattoos (yep, I said tattoos).

Straight-out timed combat pits two players against each other wherein each of the characters draw their powers from the various tattoos on their bodies. Synchronous movement between joystick and characters is difficult and often frustrating, and the character animation can be slow and choppy at times.

Perhaps the biggest problem with this title, though, is its extraordinary lack of any real innovation. With few exceptions, almost every move in the game looks like it was pulled from another fighting game, down to the ending fatalities. If you've got a quarter, you'd do better with *Mortal Kombat II*, it's the same game with better playability.

Rating: ★★

Tattoo Assassins'* fatalities bear a striking resemblance to those of *MK II

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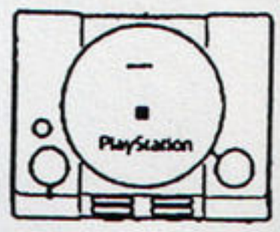

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Missives, epistles, briefs and communiques

If I could, I'd like to ask Mr. Tom Kalinske a question: If Saturn and 32X are "intended for different audiences" then why the delay? First give us the real thing, then give us the "low-cost alternative"...please.

Gambler

A fair point.

Once again I was pleasantly surprised when I read the new issue. I really enjoyed the article on the Sega Saturn and hope that the Ultra 64 is planned for the future.

However, I see that there is a missing platform from your many reviews: Macintosh. Granted, the Mac is not a game machine. Correction: The Mac is now a game machine as of December 23, 1994. The day Bungie Software released *Marathon*.

This incredible game takes the tried and true *Doom* genre to new levels with an in-depth story, moody settings, and extreme gameplay. Coupled with the Power Macs' number-crunching ability, the resolution is much higher than anything on the PC. This, therefore, translates to incredible graphics.

To pass this title up is a disservice to the next generation of games, as this is the first "real" Mac game available. I truly think that an article on Bungie itself, or at least a preview of *Marathon*, is in order, especially since the Pippin is on track.

djkrush@aol.com

Chill out. More Mac games — including *Marathon* — will be reviewed in forthcoming issues. That's a promise.

I read David Perry's article and thought it was brilliant. I have great admiration for the man and I hope to follow in his footsteps. But I must protest, Mr. Perry started when nobody took the game industry seriously, and now everyone wants to get in on the cash. He encourages kids to become game designers, as if there weren't enough like me who can only dream of designing games for a living. Look through the last pages of **NEXT Generation** and count how many game companies want to hire programmers, artists, etc., now look closely: Everyone wants to hire artists/designers with *years of experience*.

How am I (and the rest of us) gonna get started if we don't have the experience they want (as if being a dedicated game player and having talent and wanting to cultivate the industry wasn't enough already?).

John Smith

The 'years of experience' catch 22 is familiar to anyone who's ever tried to find a job. A common way to get into gaming design is to study design in another field (TV animation, magazine layout, illustration, etc.) and then — once you have an impressive portfolio — approach some game developers. It also never hurts to always favor computer-aided design in choosing career paths/training. We wish you good luck.

The main reason I'm dropping you a note is to commend you on your article on retrogaming, "Revival of the Fittest." I had been having this same conversation with some folks on rec. games. video. advocacy this week. This is exactly what I'm missing in a videogame market filled with FMV, half-baked concepts, and too many copies of fighting games and platform games — good quality gameplay that sparked that visceral response and allowed enough freedom to play however you wanted to play. One look at the games on my hard drive (all of them small-size ports of older games, with two exceptions — *Descent* and *One Must Fall*) made me realize just how few quality games in the 'classic' style are presently out there.

It's not that I don't like platform games and first-person games, but once I've been through them a few times and/or completed them, there's no more challenge, no reason to go back and try it again. Why spend $50 on something that won't give me any real, lasting entertainment?

I hope that Nik Wild's belief that 'classic' games will be back once everyone's finished showing off their FMV and 3D artwork is true, or else I'll be forced to spend most of my videogame dollars on 10-year-old consoles.

davidj@vnet.net

We're parking our cars in the same garage, David.

Nice magazine! I recently went to Babbages and asked about the release date for the PS-X (I know it was around September, but I figured that they'd have a better idea). The salesman said, "Yeah, I know about it, though I haven't seen one." I thought, "How could he possibly have seen one, anyway?" He went on to explain to me that in larger cities (L.A., New York) they are already on sale. Yeah, right, I thought. He continued and told me that Sony is right now test-marketing the machine and actually selling them in larger toy stores.

So here's my question: Is there any truth to this? If so, how come nobody has written anything about it? Or is he just lying? I tend to think it's the latter. The reason I think he's lying is because other stores have lied to me before: I called Software Etc. and asked if *Final Fantasy 3* was in yet (on the release date). The salesman said, "Shipment has been delayed by the manufacturer." Not believing him, I went to Toys R Us. Lo and behold, there on the self, *Final Fantasy 3*. On the same day, too.

That's why I like **NEXT Generation** so much. Info that I feel I can trust!

Minh L. Nguyen.

He's lying. **NEXT Generation** has the utmost respect for 99% of game salesman — these are guys (and gals) who have to deal with perpetually changing release dates, tons of faulty software, compatibility problems, unreliable manufacturers and (of course), John Doe on a day-to-day basis.

However, there's the 1% who don't know and so just make it up. The fact is that occasionally products do launch in some 'test' markets before making it national. Atari's Jaguar is a prime example (it was available in San Francisco and New York six months before anywhere else). *Final Fantasy 3* is another example of this. PlayStation, however, is only available on

corresponding

import until the machine's official launch in the fall.

Anyone wanting details of where to obtain an imported PlayStation can call us at (415) 696-1688 and don't forget to ask for Micky the Chin.

I've just read the first two issues of your mag and loved them thanks to the long articles and in-depth interviews. I do have one complaint however, and you've probably had quite a few letters about this already.

Your ratings are awful. It isn't the objective opinions of the people that rate them, it's the rating system itself I don't like. Using only five different possible ratings (four actually, because a game rarely deserves a perfect score) doesn't give the reader a very good idea of the quality of the game. Also, you need to have at least two people review the games, preferably more, but at least two. I realize you are trying to give short concise reviews, so that you can fit more in the magazine on fewer pages. But, do you think someone who is going to spend $40 to $60 on a game wants a short, concise review? I sure don't.

If you want to give experienced gamers what they want, I believe it would be great to give more complete reviews on more pages.

Gary Kramer
gakramer@databank.com

No, not many people have said they don't like our ratings system (a lot fewer than we predicted, in fact). But let us answer your points one by one. First, many games earn five stars, so there are five scores possible.

Second (and to tie up your last point about what 'experienced' gamers want), we believe that most experienced gamers will realize that five categories gives enough scope to pigeonhole titles as worth investigation by the reader or not. A more specific score is far too prone to the reviewer's personal preference.

Third, why two reviewers on the same game? Just because some other magazines use this ludicrous system doesn't mean that you have to defend it, or that we have to use it. With two reviews, whose opinion are you meant to believe? And, if they're the same opinion, what's the point of having two?

Anyway, **NEXT Generation** is a magazine of *information*, not a buyer's guide. Our objective is to give you the information so that you can make your own choice, not to force opinions down people's throats.

I purchased a 3DO for myself this Christmas — what a great system. I was blown away when I powered up my new family member (3DO) which I had attached to my Surround Sound Stereo System. The crowd noise in *FIFA Soccer* was incredible.

Will you be writing a feature on sound in games and also, while I'm asking, will you include information on how to get the best results from your system?

Bill Ziegenhagen
Dallas, TX

The answer is coming soon to an issue of **NEXT Generation** near you, Bill. Hopefully in two or three months time.

I have a few requests for the people who are bringing *Doom* and *Mortal Kombat II* to the 3DO.

Let's start off with *Doom*. The one thing that makes *Doom* so exciting and that gives it such great replay value is the ability to blast your buddy on a different computer. So I am pleading with you not to make the same mistake that both Sega and Atari made. If you want to sell systems, then make it possible to network more than one 3DO with another to play *Doom*.

And not just a modem for the phone lines. I want to be able to have two or more 3DO's in the same house running a multiplayer deathmatch of *Doom*.

I know your thinking: Who can afford to have two 3DO's? Believe me, it is much more plausible than owning two $2,500 computers. Also maybe two or more friends might have 3DO's and they could bring them all to one person's house. And don't wait to have this option on *Doom II*. *Doom* without multiple players is like a car without an engine, it looks good but it just won't work. So, I urge you to strike now while you have the market largely to yourself.

While I'm making requests, I have one suggestion for *Mortal Kombat II* for the 3DO. It is fairly apparent what the controller configuration will be: high punch will be left shift, low punch will be the A button, block will be the B button, low kick will be the C button, and high kick will be the right shift. If this is correct I have one or two suggestions. Since it may be difficult to charge C and block at the same time why not make Jax's and Liu Kang's charge moves work with either high or low kick. It would be much more possible to charge the left shift and still be able to block and punch. Or you could include an option to modify the controls and let the player decide which configuration she or he likes best. If you go with the second option I would strongly suggest that you have to save the configuration, so the player does not have to reconfigure every time the game is turned on.

Since the future conversions of *Doom* and *Mortal Kombat II* for the 3DO will definitely be the best ones to date, I believe it would show that 3DO company cares about the players if it were to include these aforementioned options in the games.

Scott A. Cobler

Are you listening, 3DO? Any feedback on Scott's suggestions will be gratefully received.

Mailshot

Want to get something off your chest in public? Want to send an anonymous message of respect/abuse to the programmers of your last software purchase? Go on, you know you want to. **Mail shot** the interactive entertainment industry! Post it here, usual address.

CORRECTION

The following text was missing from last month's news article 'Beginning of the End for Video CD?'. Hey, we're only human. Blame *Super Bomberman*...

Because of the current state of CD technology and the limitations of single-speed drives, compression routines used to put movie footage onto CD discard around 98% of the sound and picture information (the image resolution is quartered before any compression takes place).

And the MPEG1 algorithms, which rely on interpolating between key frames, have to be ruthless in order to squeeze several gigabytes of digital data into the 650 MB of a CD. Picture artifacts like mosaicking and haze effects mar any possible fast-moving scenes and the topping and tailing of the audio information — whereby high- and low-frequency sounds are stripped out — means that the sound isn't as dramatic or involving as LaserDisc or VHS.

Picture integrity is also at the mercy of the encoding system. Careful encoding can minimize artifacts, but if Video CD does take off, many more companies will be interested in releasing discs as fast as possible, although with a resulting reduction in quality.

The irrevocable march toward digital video hasn't been halted by recent events, but it certainly opens the way for another format war. And Sony for one will not want to back the wrong horse after the fate of its Betamax standard.

An affordable mass market HDCD system has been suggested as being anything from two to five years away. Which is neither long enough for Video CD to gain a firm foothold nor short enough for it to be replaced at the drawing board stage. Whatever the timescale, Video CD already proves to be intermediate old-before-its-time technology.

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Letters from desks on the front line

Randy Breen is the producer of the highly successful *Road Rash* series for Electronic Arts. Having produced 16bit Genesis and 32bit 3DO versions of the *same game*, he has a unique insight into what advantages the next generation of game machines will *really* bring.

If the transition from 8bit platforms was a step, then the transition from 16bit to the 32bit world will be a leap. Historically, with each new turn in technology, our ability to produce more compelling experiences increases dramatically. This is particularly true with the transition from the 16bit systems to the 32bit systems where advances in audio and visual technology allow developers to explore new ideas and advance the state of the art in software entertainment. The sonic and visual realism of which these systems are capable of allows developers the ability to create more satisfying products. Ultimately, I believe that products will attract new customers and continue to expand the videogame market.

Improvements to graphic quality is the most obvious advantage to games on 32bit systems, instead of struggling with a very limited range of colors as on the 16bit platforms. For instance, the available colors on the Genesis tend to be saturated with sharp differences between gradients. And on the other hand, the 32bit platforms allow developers to create much more sophisticated visual presentations.

Advances on audio on 32bit systems may look less obvious than the graphic enhancements but its impact on presentation is even more significant. Developers are not hamstrung by the limits of the machine to produce synthetic sound; nor are they confined by severe memory constraints limiting the quality, length and diversity of sampled audio. Music and sound effects can be created by musicians and technicians using tools with which they're familiar.

The application of video in 32bit products offers developers new ways of expressing their ideas. I've heard a lot of discussion both for and against the use of video content in videogames. Those opposed to the use of video feel the costs are too high and the content doesn't add anything to the game. I tend to disagree with these arguments because I don't believe the use of video necessarily reduces the scope of the gameplay, I also believe that when used effectively video can create a much more compelling and complete experience.

In terms of value, when video is well-integrated with the product it has the capacity to draw people into the experience very quickly. This is perhaps even more important with new customers who need stronger motives for their activities. Video adds entertainment value because it can be created for a special purpose. It is very effective when used to produce a particular emotion instead of trying to produce the same effect in a dynamic game environment.

I also believe we are only beginning to explore the use of this kind of content. As time goes on, developers will come up with new and better ways of incorporating video.

I have also heard arguments that suggest the games themselves (the interactive part) will not improve significantly on 32bit machines. I don't buy it. I remember hearing similar arguments against the use of color systems in the earliest days of computer games. Advances to the A/V technology add up to huge improvements to the game in terms of the amount of impact each interaction has on a player.

CD-ROM storage devices not only allow us to store higher quality content, they also allow us to add much more variety to the A/V (audio/visual) elements of the game. As new elements are added to the game environment, people expect more variety in the behavior and the interaction with these elements. There is no way around it. Just adding more graphic detail seems to increase people's expectations of how each element in a game should behave and how the player could interact with them. This expectation drives developers to create more diversity in the gaming world and helps increase the player's sense of discovery and wonder.

"I have also heard arguments that suggest the games themselves won't improve significantly on 32bit machines. I don't buy it. I remember hearing similar arguments against the use of color systems in the earliest days of computer games"

Because the complexity of the products has increased so dramatically, I think we will find that design and technical advances will evolve over a longer period of time. For example, developers seem to reach the technical limits of the Sega Genesis within the first couple of years. Beyond that, the most significant changes have evolved out of larger capacity cartridges. There seems to be a lot more potential growth for the 32bit machines. Just the fact that there is more design freedom, more territory to explore, leads me to believe that the 32bit machines will have a longer technological life cycle.

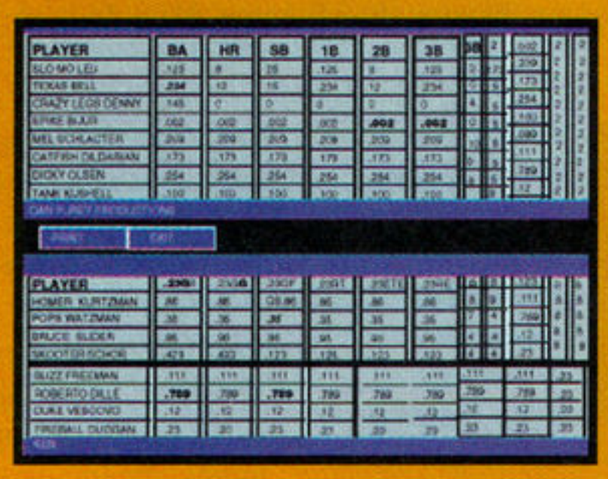
The first-generation machines are produced in an unstable environment with incomplete tools. Designs are generally limited to minimize development risk. Second-generation products for the 3DO are only beginning to explore the limits of the machine. Because the platform and the development tools have stabilized, developers can explore new ideas with less risk of working down a dead-end path. Simply knowing what another developer was able to accomplish encourages others to try things they might not've tried otherwise. Third-generation products will benefit from this work and developers will have more freedom to explore new ideas with the knowledge that the basics are understood.

It's a very exciting time in the entertainment software industry. There's lots of uncertainty about the future, but I see this as a short-term problem. I believe the machines offer us opportunities to create products with a much greater diversity, thus aiding to broaden the whole of the gaming market.

The 16-bit videogames failed to impress many adults because the A/V presentation of these products didn't meet their expectations. These people have developed the expectations having spent years watching and listening to high quality TV, film and music. There is an adult gamer market on the PC, but the market is limited by the cost and complexity of the machine and by a certain amount of resistance to playing games on a machine intended for work. Videogame machines don't suffer from these problems, but until now the presentation hasn't been interesting enough to attract a large adult audience. All of this will definitely change in the next few years and I'm happily in the middle of this chaos.

Randy Breen, February 1995

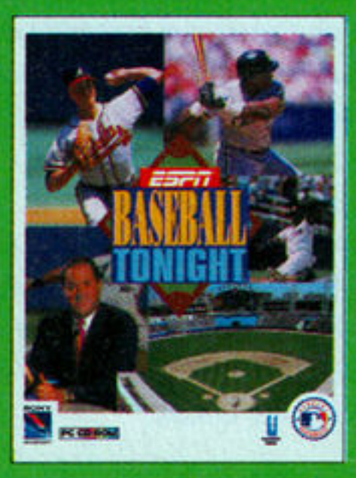
[ESPN BASEBALL TONIGHT] *versus* [The competition]



We have stats. ➤ **They have stats.**

We have "3-D rendered" major league ballparks. ➤ **They have stats.**

We have all the major league teams, and all the major league players. ➤ **They have all the stats.**



What good are stats if your players look like a bunch of mutants? ESPN Baseball Tonight is the first PC baseball game to combine great stats with all 28 major league teams, all the players, and great gameplay.

We filmed live players and digitized them into the game using 15,000 frames of player animation. So you'll see every detail, from the baserunner's nervous lead to the batter's depressed walk back to the batter's depressed walk back to the dugout after he whiffs.

Super VGA graphics display the game in 256 colors — more than any other game. Even the management is realistic. You can trade, edit and change players' stats. With over 10 minutes of video highlights, instant replays and "live" commentary from ESPN's Chris Berman and Dan Patrick, this is the most realistic PC baseball game out there. If you don't believe us, our competition has plenty of statistics to prove it.

For PC CD-ROM and floppy disk. Also available for Super Nintendo, Sega Genesis and Sega CD.

EVERYTHING ELSE IS JUST PRACTICE™

Next Month

Sony's Plans Revealed

Sony's US boss speaks exclusively with **NEXT Generation**. Just what is the thinking behind the US launch of the ultimate game machine? What is Sony's hidden agenda? And how does Sony rate the competition?

Apple

The computer whiz kids from California's Silicon Valley want a slice of the gaming action. Their new game box is called 'Pippin,' and they claim it's as powerful as the PlayStation. But has Apple bitten off more than it can chew?

NEXT Generation #5
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