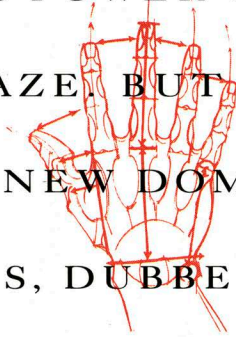


CHRIS GENTILE '81

H A N D I N

YOU KNOW MATTEL'S POWER GLOVE AS LAST YEAR'S CHRISTMAS TOY CRAZE. BUT THE POWER GLOVE IS LEADING US INTO A NEW DOMAIN OF SERIOUS COMPUTER APPLICATIONS, DUBBED "VIRTUAL REALITY."



Chris Gentile '81 and the product of his invention: Mattel's Power Glove

In the just-released North Pole Poll of selected retailers and consumers, video games were, for the fourth year in a row, atop America's most-wanted-toy list, and four of the top five toys were Nintendo products . . . such as Mattel's Power Glove . . .

—Washington Post (November 24, 1989)

Mattel added 1/2 to 10 3/8. Kidder Peabody repeated a recommendation that investors buy the stock because of its belief that the company's "power glove" product for the Nintendo entertainment system will be a hit.

—Wall Street Journal (December 1, 1989)

What the Power Glove does is extend two-dimensional games into a third dimension, the space in front of the screen. Before long . . . children may jump into Wonderland with Alice or put Humpty Dumpty back together.

—New York Times (February 10, 1990)



gain last Christmas hundreds of usually sane adults were transformed into hysterical fiends in their quest to fulfill little Johnny and Susie's fondest wish.

This time it wasn't the Cabbage Patch Doll that forced parents to fistfights or tears, but Mattel's Power Glove, the hottest accessory to the hottest video-game system, Nintendo.

The Power Glove, which retails for \$89, debuted a mere six weeks before Christmas, selling an amazing 654,000 units before Santa's first appearance. Overwhelming demand caused prices to rise as high as \$139 per glove. The glove still won't

GLOVE

BY RENÉE GEARHART LEVY



stay on the department-store shelf.

The Power Glove is not just another video game accessory. It is the first consumer product derived from technology known as virtual reality. In virtual reality, fully three-dimensional controllers (such as the glove) combine with stereoscopic viewing devices to create the ultimate computer-generated environment. Users feel part of the scene and interact naturally with it, rather than merely controlling it.

The Power Glove is the brainchild of Christopher Gentile (pronounced Jentilly), a 31-year-old engineer and principal in the New York City-based company Abrams/Gentile Entertainment, known as AGE.

For Gentile, the Power Glove, which was adapted from a \$10,000 computer peripheral used by NASA robots, is only the beginning. He plans to revolutionize the computer industry by scaling down \$2- to \$3-billion virtual reality systems now used by the government and research institutes to fit the mass market.

AGE has a vision of people working and playing in electronic fantasy worlds that will transform entertainment, education, engineering, medicine, and many other fields. The company is developing a product called TVR (for Total Virtual Reality). TVR, Gentile explains, makes high-end virtual reality "total" for the consumer, who will explore new environments without the constraint of keyboard, mouse, or monitor. As AGE touts its technology: "A better link between man and machine."

RENÉE GEARHART LEVY is an associate editor of Syracuse University Magazine. In our June 1990 issue she profiled food writer Kay Shaw Nelson.



First there was Pong, the original video game, which simulated table tennis in two dimensions on a video monitor. Although the action was laughably restrained by today's video-game standards, Pong was an exciting development for its time: it gave the average person the ability to interact with and control an artificial world created by a computer.

That was in the late seventies, before Pac-Man, before Donkey Kong and Centipede, before Nintendo, the home video craze that has penetrated nearly 25 percent of all American homes, hypnotizing an entire generation and racking up roughly \$3-billion in annual sales.

Nintendo is set apart from other video games by its ability to draw the player into the game. Increased computer power, more interesting graphics, and creative story lines make these games more inviting than ever before. But if Nintendo brought video games to a higher level of play, Gentile's Power Glove has elevated the medium to another plane entirely.

A basic Nintendo set is sold with a pair of hand-held controllers, with buttons that rock back and forth to convey motion in two dimensions. Optional devices such as a joystick or a light gun, are also available. The Power Glove replaces all such controls, creating more authentic human-machine interaction.

Slightly bulky and resembling the latest in spacewear, the glove enables a player to control a game merely by moving her or his hand or fingers through the space between player and TV screen. Rather than master-

ing a control device, a player merely dons the glove.

"The glove is self-contained," says Gentile. "It knows how you work. You just act naturally and it automatically translates that into commands."

This capability is particularly satisfying when the game calls for hand motion. In a game involving gunplay, for example, the player's gloved hand doubles for the shooting hand on the screen. In the game Mike Tyson Punch-Out, the player punches high and right with the glove and his on-screen character throws a high-and-right punch. In handball simulation, the player uses an open or closed palm to swing at the ball.

"You get a simulation of feeling like you're playing the game," says Gentile. "It also gets the kids off the couch and gives them a little exercise."



Today Gentile is working on TVR, an outgrowth of the Power Glove that promises to be bigger and more magical than anything Nintendo offers.

Imagine putting on a headset and glove, turning it on, and finding yourself inside a Formula One race car. You can raise your hand and grab the steering wheel. Look to the left or right and see out the car's windows. Flip open the sunroof and see helicopters attacking. That experience, available for less than \$300, will hit the stores by 1992, says Gentile.

The key to TVR is the new head-



Gentile recently paid a visit to the SU campus, where he showed students applications in the works for the Power Glove.

mounted video-display system AGE is developing. Working in conjunction with the glove, the video display replaces your two-dimensional television screen with a fully engulfing, stereoscopic environment. The headset contains a small LCD monitor for each eye, outfitted with wide-angle optics and transmitting 3-D graphics. It is also outfitted with sophisticated devices to track head motion (just as the glove tracks hand motion).

It's sort of like a big pair of sunglasses, Gentile says, except when you put them on, you're inside a computer-generated world. There are no distractions.

The artificial reality machines that exist cost millions of dollars, the result of 25 years of research by NASA, the Air Force, and several universities—research originated for defense purposes. AGE is committed to taking technologies and products that weren't meant for the consumer market and re-engineering them for affordability.

"We want to give consumers experiences that they wouldn't get for years to come," says Gentile.

With TVR in the pipeline, AGE is perfecting other elaborations of the Power Glove concept. Next year the company will introduce a glove to operate a personal computer, replacing keyboard and mouse.

Gentile has also adapted the glove to simulate four musical instruments: piano, clarinet, trumpet, and flute. "I can software-generate any imaginary control panel out in space and you can manipulate it as if it were really there," he says. The Four Tops have expressed interest in a professional music glove for an upcoming European tour.

"That's fine," says Gentile, "but we really want to see it reach the mass market."



Gentile was thinking of becoming a physical education teacher until he accidentally blew up a high school physics lab while attempting to formulate phosphorescent material.

"I'd always had a love of inventing," he says. "My physics teacher pointed me toward engineering school." He came to Syracuse, where he says he spent four years trying to impress his older brothers, twins Anthony and John—filmmakers, artists, and novelists who Chris describes as "geniuses."

After graduating in 1981, Gentile went to work in nuclear engineering, eventually supervising design engineering at the Millstone III Nuclear Power Plant in Illinois.

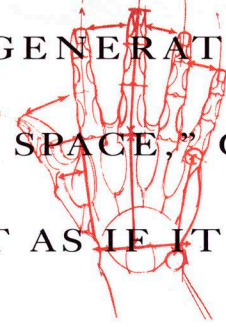
His brothers, who had been running an entertainment marketing and design firm in New York, were designing posters for the movie *Rambo* when they hit upon the idea of acquiring a license to devise Rambo toys. With the assistance of toy industry veteran Marty Abrams, the concept became a success. Abrams and the Gentile twins joined forces.

The idea was to operate a wide-ranging entertainment company, with development projects ranging from toys to film and theater productions. They needed a technical person to handle the electronic and technological design required in the modern toy industry and began consulting with Chris. He soon came aboard as a full partner.

The four principals occupy 6,000 square feet in a 1920s Italian revival building in Manhattan. It's an eclectic space they designed themselves. Four large offices are separated by windows; from wherever you stand, you can see from one end of the building to the other.

John and Anthony's children are frequent visitors, no doubt because of the gadgets that fill the place. "I have a running account at Toys R Us," says Gentile. "I buy almost every toy that exists." And then there are the AGE products and toys Chris has developed that will never hit the mar-

“I CAN SOFTWARE-GENERATE ANY IMAGINARY CONTROL PANEL OUT IN SPACE,” GENTILE SAYS, “AND YOU CAN MANIPULATE IT AS IF IT WERE REALLY THERE.”



ket. There is, for example, a radio-controlled model car equipped with a miniature video camera. As the car glides around the room, it beams images of the terrain to a video screen in the remote control device. How better to find lost earrings under the divan? But the cars are too expensive, Gentile says: “They’ll never be made.”

AGE employs up to 150 subcontractors at a time, usually research scientists, who help to develop product prototypes. Once that stage is completed, AGE typically licenses the product to a toy manufacturer for production and marketing. Sometimes, though, AGE remains involved through marketing. “On some product lines we’ll shoot a commercial or we’ll have music written for the jingle,” says Gentile. “We really don’t just sell a widget. We sell feel.”

AGE’s projects are all over the board. They include Fazz, a jewelry line for children produced by Hasbro; and Playskool’s Busy Soft Vehicles, stuffed cars and trucks with learning capacities built in. There’s a teddy bear so top-secret the Gentiles won’t disclose details until it’s shown at the annual Toy Fair next February.

And that’s not all. AGE is also producing a television series starring George C. Scott, and has developed the screenplay for *G.I. Joe—The Movie*, to be produced with Warner Bros. this fall.

The Gentile brothers insist their work isn’t as diverse as it seems. “In a sense it’s all creativity,” says Chris. “It’s coming up with new concepts, new ideas, and being able to apply them in what ever medium we’re working on.”

Sometimes it seems that every kid in America either has Nintendo, or would hock his best sneakers to get it. The picture was quite different in 1986, when technologies essential to the Power Glove were first being developed.

The home video market was largely abandoned by toy manufacturers in the mid-1980s, by which time nearly every kid owned a video game (probably Atari) and had grown bored by its limited repertoire of tricks. According to *Newsweek*, sales for the whole industry, which had reached \$3 bil-

lion in 1983, fell to \$100 million in 1985.

But not everyone had given up. In the loft on West 54th Street that would become their present headquarters, sandwiched between the old Studio 54 nightclub and a welfare hotel, the principals of the newly formed Abrams/Gentile Entertainment had their sights set on revolutionizing the frontier of video play. They wanted a system that would “break through” the wall of the TV screen.

AGE set about designing a brand-new system, to compete with standard video games. Dubbed 3-E, which stood for 3-D Environment (“the next thing after 3-D,” explains Gentile) the machine used stereo digital sound, holophonic surroundsound, and a video method that would mix live-action video with computer-generated graphics. The game used active LCD glasses to provide 3-D visuals and was controlled by, you guessed it, a glove.

Timing is everything, however, and by the time Gentile’s prototype was finished, Nintendo had started to take off. All the major U.S. toymakers were making software for it. “For any of them to take on 3-E—not only would they have to go up against Nintendo, but they would have to lose \$20 to \$30 million of their other business selling Nintendo cartridges,” says Gentile.

Eventually, though, Mattel asked AGE the inevitable question: Can you do to Nintendo what you’re doing with 3-E?

“At that point, we figured if we couldn’t beat ‘em, join ‘em,” says Gentile. And out of a seeming failure came one of the greatest successes of the video era.

Although Nintendo, played on a television, can’t provide stereoscopic visuals, the glove’s three-dimensional controlling environment proved immediately applicable. AGE pulled the glove out of 3-E and built a \$100,000 prototype for Nintendo. After licensing the concept to Mattel, the toymaker hired Chris as a technical consultant to develop the product for the consumer market.

Mattel had two major requirements for the glove: that it work with all existing joystick games, and that it be capable of having games specific to the glove alone.

Until this month, the glove was working in the joystick emulation mode, breathing new life into old games. “The glove changes the way a game feels,” says Gentile. “It works

effectively and it’s fun to play with.

“But,” Gentile adds, “it’s not the best way of playing with the glove.” With the new Glove Gaming Series, on-screen visuals are totally controlled by the glove. The computer knows the exact position of the glove outside the screen and responds to every movement—the way you throw, the way you rotate your hand, etcetera. With Glove Pilot, you control your interplanetary fighter by actually “reaching” into the game to control the instrument panel displayed on the video screen.

Exciting, yes. But none of this is enough for Gentile. “Virtual reality has mass applications,” he says. “This is just opening the door.”



So in an unusual twist, a space-age technology has spawned a children’s toy, which is blazing the trail to professional tools in a variety of endeavors.

“We went directly from research to the toy industry and now we’re working our way back to practical applications,” says Gentile, who’s convinced that TVR is going to go “all over the place.”

“The toy version that comes out first is just going to fuel the fire to get these higher-end products out there.”

He’s talking TVR for architects and engineers. “I’m an architect. I design a building on a CAD system,” he explains. “I have all my clients put on a helmet and I walk them through the building. The first brick hasn’t been laid yet, but I’m letting them see what that building will be.”

Gentile says the head-mounted unit will allow the architect to enter that same building from a variety of perspectives—the height of a child or a person using a wheelchair—to better anticipate design hazards.

TVR’s unlimited potential for creating environments makes it one of the most powerful stimulants to the imagination ever.

“We’re bringing technology of the future to the consumer today,” says Gentile. “We want to create Disneyland on every street corner in America.” ■