

May 9, 2004

## The Chrome-Shiny, Lights-Flashing, Wheel-Spinning, Touch-Screened, Drew-Carey-Wisecracking, Video-Playing, 'Sound Events'-Packed, Pulse-Quickening Bandit

By GARY RIVLIN

When Anthony Baerlocher makes his monthly visit to the Atlantis Casino Resort in Reno, Nev., he always starts with a ritual he calls "taking inventory," walking several laps around the casino's sprawling 32,000-square-foot gambling floor and noting which machines sit unloved, vainly burping out their come-hither sounds, and which machines have captured players' attention. The Atlantis is home to more than 1,400 slot machines, but so vivid is the mental snapshot that Baerlocher, 35, carries in his head that he immediately registers the presence of a new machine on the floor. Although Baerlocher is a trained mathematician, his interest is far from academic. He is the chief game designer for the country's largest maker of slot machines, International Game Technology of Reno. At the first sign of a new slot machine from a competitor, he goes into action. "Give me 30 minutes and \$60," he says, "and I can tell you pretty much anything you want to know about another company's machine."

At 8 p.m. on a warm midsummer's night, Baerlocher watched a woman dressed in green polyester pants and a yellow-and-white-striped short-sleeved top play a slot machine he designed called "The Price Is Right." At first, the woman's body language was noncommittal: she stood half-turned from the game, as if no more than mildly curious about the outcome of her wager. "Price" is what slot pros call "a cherry dribbler," a machine that dispenses lots of small payouts while it nibbles at your stash rather than biting off large chunks of it. "You want to give the newbie lots of positive reinforcement -- to keep 'em playing," Baerlocher told me. As if on cue, the woman hit a couple of small jackpots and took a seat. "Gotcha," Baerlocher said softly under his breath.

Baerlocher also watched players nearby at another machine he designed for I.G.T., "Wheel of Fortune." I.G.T. is to the slot industry as Microsoft is to computer software, and no product contributes more to I.G.T.'s bottom line than what industry insiders simply call "Wheel." How big is it? In its 14-year lifetime, "Madden N.F.L. Football," from Electronic Arts, has made roughly \$1 billion, making it one of the most successful home video games ever produced. "Wheel of Fortune," by contrast, takes in more than a billion dollars each year.

As in the televised game show, there is an actual wheel, which spins whenever a player reaches the bonus round, on average once in every 42 plays. The presence of the wheel allows the slot machine to employ one of the most powerful feints in the slot designer's arsenal: the near miss. When a contestant spins the wheel on the game show and it stops one or two spots past the \$1,000 mark -- that's a near miss. The slot machine version of "Wheel," like many of I.G.T.'s most popular slots, is designed to produce these near misses, lots of them: though the wheel is divided into 22 pie slices of equal size, the odds are weighted so that a player is likely to land on some wedges far more often than on others.

After a couple of minutes, an older woman, dressed in a sparkly pink sweatsuit ensemble, reached the bonus round. She groaned when the wheel nudged past the "250 times bet" wedge and landed on "10 times bet." Her male companion cried out, "Honey, you were so close!" Baerlocher's starchy mien melted away, revealing an amused smile. "You can see it on their faces every time," he said. "They feel they came soooo close. They're ready to try it again, because next time they're going to get it."

Baerlocher shook his head and laughed in a way that suggested he never gets bored witnessing this moment. He is among a cadre of people inside I.G.T.'s giant slots factory who study addiction -- though unlike their counterparts in academia, of course, he and his colleagues work on the promotion side of things. He is so devoted to the slot machine that he has one in the front room of his town house, in the hills above Reno, and a second one downstairs in his den. We lingered another minute or so, long enough to watch the lady in pink slip another \$20 into the machine, confident that this time the wheel wouldn't make those extra couple of clicks.

Nearly 40 million Americans played a slot machine in 2003, according to an annual survey of casino gambling conducted by Harrah's Entertainment. Every day in the United States, slot machines take in, on average, more than \$1 billion in wagers. Most of that money will be paid back to players, but so great is the "hold" from slot machines that collectively the games gross more annually than McDonald's, Wendy's, Burger King and Starbucks combined. All told, North American casinos took in \$30 billion from slots in 2003 -- an amount that dwarfs the \$9 billion in tickets sold in North American movie theaters that year. Pornography, the country's second most lucrative form of adult entertainment, doesn't come close, either: experts estimate that Americans spend at most \$10 billion a year on live sex shows, phone sex and porn in various media from cable to DVD to video and the Internet. Is it any wonder that Baerlocher's boss, Joe Kaminkow, I.G.T.'s head of design and product development, likes to say that he's in the business of creating "beautiful vaults"?

Although it has frequently been controversial -- Fiorello La Guardia and Earl Warren are among those who have made headlines crusading against it -- the slot machine has traditionally enjoyed little status in the world of casino gambling. Slots were where the wives of the high rollers sat, killing time with buckets of coins. But revenues from the games have grown exponentially over the past few decades, according to Bill Eadington, director of the Institute for the Study of Gambling and Commercial Gaming at the University of Nevada, Reno, and now the slot machine is the undisputed king of the casino. Craps, blackjack and roulette -- which once defined organized gambling -- are going the way of tuxedos and diamonds inside the modern-day casino, where the standard dress these days tends toward polyester and athletic wear. Accounting for

more than \$7 out of every \$10 of gambling revenues in casinos across the United States, the once lowly slot machine is the top earner even in glitzy palaces along the Las Vegas strip.

Not only have slots been capturing an expanding share of business on gambling floors across the country -- grabbing an ever greater "share of wallet," as industry insiders put it; they have also played a crucial role in expanding the footprint of casino gambling in the United States. Where casinos were legal in just 2 states at the end of the 1980's, today they are legal in more than 30 -- a trend that the slot machine, so easy to learn to play and seemingly harmless, has no doubt helped fuel. "It's the slot machine that drives the industry today," says Frank J. Fahrenkopf Jr., head of the American Gaming Association. While craps, roulette and baccarat are outlawed in roughly half the states that permit casino gambling, slot machines are widely viewed as a politically palatable solution for elected officials seeking to raise revenues -- the casino equivalent, critics say, of a gateway drug. And the trend is far from exhausted: Maryland, Massachusetts, Ohio, Pennsylvania, Alabama and Kentucky are among the states that have recently considered installing slots at racetracks to generate needed tax revenue.

Fahrenkopf is reportedly paid in seven figures to praise all things casino, but he can't seem to help taking a poke at the slot machine. He views the transition from table games to slots as symptomatic of the dumbing down of American life. Playing craps means learning a complex set of rules. Blackjack may be easy to learn, but it still requires skill and concentration, and it's not uncommon for the novice player to feel stupid in front of strangers. "I don't know if it's the education system, or maybe it's that we as a society have gotten intellectually lazy," says Fahrenkopf, who headed the Republican National Committee under Ronald Reagan. "But people would rather just sit there and push a button." When I asked one elderly man to explain the allure of playing slots, he replied, "I don't have to think."

Slot machines are in fact for those well into the second half of life. Manufacturers design games primarily for women over 55 with lots of time and disposable income, and casinos near retirement communities in and around places like Phoenix and San Diego operate small fleets of jitneys that shuttle back and forth to assisted-living centers. As a come-on, one casino advertises free oxygen-tank refills for its players, and heart defibrillators are increasingly becoming standard equipment inside casinos. If a good portion of the younger set today is hooked on video games, it seems that the over-60 crowd has its own similarly hypnotic fixation. "For older people, it's a safe environment," Baerlocher says. "There are cameras and security guards everywhere. You can go to one place and shop and eat and be in a crowd even if you don't know anybody." As one old Las Vegas hand put it, the country's casinos are now providing "day care for the elderly."

The archetypal slot machine was invented in 1899 by Charles Fey, a German immigrant, in San Francisco. But most modern-day slot machines bear little resemblance to the familiar one-armed bandit with its three reels spinning behind a pane of glass and mechanically click-click-clicking into position with each pull of a lever. Today's slot machines feature well-choreographed illusions designed to hide a fundamental truth: at heart they're really nothing more than computers whose chips randomly cycle through hundreds of thousands of numbers every second. A player's fate is determined almost the instant play begins. But to simply display a long string

of numbers on a computer screen, along with an accounting of the money won or lost, would hardly prove entrancing.

That said, the computer chip at a slot machine's core does account in part for the exploding popularity of slots -- it means flexibility for game designers. The physical size of the spinning reels in most of yesterday's mechanical machines typically limited them to 22 stops and just over 10,000 possible combinations. Computer technology lets game makers weight the reels so that winning big occurs as infrequently as, say, one in 46 million plays (the odds of hitting the big multimillion-dollar jackpot on "Wheel of Fortune"). The increased odds make possible today's huge jackpots, which reach into the millions of dollars on some machines. You can double your wager on a hand of blackjack or win 35 times your bet on a single spin of the roulette wheel, but only the slot machine gives you the hope of turning a few dollars into a seven- or eight-figure payoff.

Still, to maintain a sense of suspense in games that are over the moment they start, to increase what Baerlocher and his fellow game designers call "time on device," I.G.T. spends \$120 million each year and employs more than 800 designers, graphic artists, script writers and video engineers to find ways to surround the unromantic chips with a colorful matrix of sounds, chrome, garishly-painted glass and video effects, which include the soothing images of famous people, from Bob Denver (the actor who played Gilligan on "Gilligan's Island") to Elizabeth Taylor, many of whom receive hundreds of thousands, if not millions, of dollars to lend their identities to the machines. The traditional pull-handle, if it exists at all, is nothing more than a vestigial limb; most players now press a button to start the reels, often virtual, spinning. Many slot machines don't even pay out coins but issue "credits" on a paper receipt to be redeemed at the cashier's cage. Slot makers have found that their customers don't miss handling money -- coins are heavy and dirty, after all -- and stereo speakers can project the simulated yet satisfying ping and clink of cascading cash. "We basically mixed several recordings of quarters falling on a metal tray and then fattened up the sound with the sound of falling dollars," says Bill Hecht, I.G.T.'s top audio engineer, when describing one of the audio files he programs into a machine.

Founded in 1981, I.G.T. dominated the expanding casino slot machine industry until the mid-90's, when video slot machines suddenly appeared. WMS Gaming, based in Illinois, was the first company to cash in on these new machines in the United States. (The marriage of slot machines and video games was first consummated in Australia.) Their popularity took I.G.T. by surprise. Bob Bittman, who was then the company's chief designer, confesses that by 1999 he and his fellow executives were anxious. The company's stock had fallen precipitously, and Bittman recognized that he was hardly the one to turn things around. "I wasn't left-brain enough -- or do I mean right brain?" says Bittman, who remains on I.G.T.'s board. That's when the company decided to hire a talented young game designer, Joe Kaminkow, to lead them into this jazzed-up new world.

Kaminkow began college thinking he would someday work as a TV weatherman, but soon his ambitions veered toward game making. He was a co-founder of a pinball-design firm in his 20's, and after he and his partner sold the company to Sega, the video-game giant, Kaminkow spent the next seven years overseeing that company's U.S.-based pinball operations.

Kaminkow knew virtually nothing about slot machines when he took the reins of I.G.T.'s design and product-development division. Yet five years later, the company has reasserted its supremacy in the slot machine industry. The majority of I.G.T.'s most popular games -- "The Munsters," for example, or "The Price Is Right" -- now feature virtual reels spinning on video monitors, touch screens and, in the bonus rounds, video clips. The company has been so profitable during Kaminkow's tenure that if you bought \$10,000 worth of stock in I.G.T. and Microsoft in the month of his arrival, January 1999, the I.G.T. shares would be worth more than \$70,000 today and the Microsoft shares about \$6,000. "I'm not worthy of being mentioned in the same paragraph as Joe Kaminkow," says Brooke Dunn, who had been Kaminkow's equivalent at Shuffle Master, a Las Vegas-based company that made a short-term foray into the slots business. Jerald Seelig, general manager of A.C. Coin and Slot, which occasionally creates machines in tandem with I.G.T., says, "History will certainly show he's one of the guys who changed the industry forever."

I was granted my first hour with the man Brooke Dunn calls the industry's god in the winter of 2003. Kaminkow is on the short side, a stocky fellow with a wolfish grin who tends to sport a grizzled, haven't-shaved-in-a-day facial growth. Despite the near-freezing temperatures outside, he was dressed in jeans and a bright short-sleeved shirt that you might wear to a summer barbecue with friends. Through most of the interview, he leaned back in his chair and propped his Nikes up on a table. He wore a red baseball cap on his head. When I told him I wanted to explore the world of casino slots from inside his design unit, he didn't need convincing. From Kaminkow's point of view, it seemed high time someone followed him around with a tape recorder. "You're very lucky," he said. "You're going to get a million-dollar lesson. You'll be going to Joe U."

Kaminkow's spacious office is drenched in pop culture. On the walls hang assorted pictures of Kaminkow in the company of any number of B-list stars: Scotty from "Star Trek," Bob Denver and Cassandra Peterson, who, as Elvira, has been featured on a couple of I.G.T. slot machines. His bookshelf includes a pair of collector's editions Monkees videos, several volumes of "The Addams Family" TV show and all five "Rocky" films. Behind his desk hangs a framed blowup of a photo signed by "Sopranos" cast members that, he said, "cost a small fortune."

One wall in the office was hidden by a set of metal blinds that Kaminkow showily snapped open partway through our first meeting. "This is our battle plan," he said. There were maybe 100 note cards, each printed with an idea for a game: "Twinkies." "Dilbert." "That Girl." "Cops and Donuts." "Beverly Hillbillies 3." Not too long ago a big-time slots maker might introduce a dozen new games at Global Gaming Expo, the annual gambling trade show held each fall in Las Vegas. That, however, was before the arrival of Joe Kaminkow, a time he refers to as "pre-Joe." By his fourth show, in fall 2002, I.G.T. unveiled 82 games at the expo, and Kaminkow, ignoring the moans from his staff, promised that the company would release 150 games a year later. (Often two years can pass between inspiration and a spot in a casino, thanks to the complications of designing a slot machine and to the onerous approval process imposed by a multitude of jurisdictions.) "G2E," as everyone inside I.G.T. refers to it, is the gambling industry's equivalent of Fashion Week in Paris. And while employees work long weeks in the run-up to G2E, the atmosphere at I.G.T. resembles that of an Internet start-up at the height of the bubble: video and

pinball games are scattered in hallways throughout the design building, and Kaminkow had a slush machine and a popcorn maker put in the communal kitchen.

Included in last year's G2E lineup were two games that represented such high-stakes gambles for I.G.T. that Kaminkow at first alluded to them only cryptically as "the big kahunas." Kahuna 1 turned out to be a "Star Wars" game -- and a coup of the first order. "Baseball and 'Star Wars,'" Bob Bittman says, "have long been the two untouchables" in the world of themed slot machines. But Kaminkow had signed deals with George Lucas for "Star Wars" pinball and video games before, and after four years of lobbying he apparently wore down the director-producer. "George said, 'I recognize and understand that my audience has matured,'" Kaminkow told me. "'They're spending time in Las Vegas and in other casinos and on riverboats.'" The question, though, is whether this game targeting a younger demographic will justify the millions I.G.T. has spent on what Baerlocher calls the "most expensive title we've ever done." I.G.T. says it does not know when the game will appear in casinos.

Big Kahuna 2 was "Drew Carey's Big Balls of Cash," and it also represented a considerable risk. Typically, Kaminkow engages the services of a celebrity sure to provide an air of comfortable nostalgia -- for instance, Dick Clark (who holds the company record for most games, at seven) or Robin Leach, from "Lifestyles of the Rich and Famous." Drew Carey is not only more expensive; his image is also far more provocative. When I.G.T. flew Carey to Reno for a day of taping at the company's state-of-the-art film studio, his caustic wit was a constant. Encouraged to improvise, Carey read only occasionally from the prepared script; instead, the comedian ad-libbed most of his own lines: "Ohhhhhh, I'm so sorry. I guess that means another walk to the A.T.M." "Don't give up, we want to build another wing on the casino." "Why don't you go get another old lady so I can take her Social Security check, too?" "Step right up -- we need another sucker."

Among the first things Kaminkow did when he arrived in Reno in 1999 was spend as much time in the local casinos as he could learning more about the games he was now responsible for designing. "I'd feed a twenty into a machine, and it'd be gone in two minutes," he recalls. The word he uses to describe the experience is not suitable for a family newspaper. The problem, he decided, wasn't the vanishing \$20 -- taking people's money, after all, is the whole purpose of these beautiful vaults -- but the speed with which it disappeared. He instructed his mathematicians to design most of I.G.T.'s new video games so that the typical player would get at least 15 or 20 minutes on a machine before needing to reach into her purse for another bill. He also wanted games that paid more frequent, smaller payouts.

Inside I.G.T. they call it "Joe's \$20 test." One of the first games released on Kaminkow's watch was based on the old television sitcom "I Dream of Jeannie." It was Kaminkow who pioneered slots based on old TV shows; he chose "Jeannie" as his first, he says, because "every woman wanted to be Jeannie" (played by Barbara Eden), and every man wanted -- paraphrasing Kaminkow -- to get to know Eden's character intimately. The "Jeannie" machine, which made its debut in 2000, included the show's big-band theme song, Eden's voice (on small payouts you sometimes hear her say, "I can do so much more for thee, master") and reel icons tied to the show: a bejeweled thin-necked bottle, a space capsule splashing into water and so on. And when you have lined up the symbols just right, you enter a bonus round that includes a spinning wheel

and a short clip from the show that lasts maybe 10 seconds. "For your \$20, you should at least get to see a little of Jeannie," Kaminkow says with a wink.

Over the years, Kaminkow has handed down a long list of edicts that I.G.T. designers call "Joe's rules." Early on, for example, the sidekick he brought with him from Sega overheard an older man complain to his companion that he had left his reading glasses in the room and couldn't see well enough to play. Kaminkow declared that henceforth the lettering on all I.G.T. machines would be large enough so that pretty much everyone but the legally blind could play. Sometimes he would reach the bonus round in a game but win no money, so that became another of Joe's rules: no zonks; players who experience the fanfare of a bonus round receive at the very least a consolation payout. He also dictated that whenever a bonus round offered players a choice, the machine would reveal the values of the options not selected. "You want the player to have the feeling, 'I almost picked that one; I'll get it next time,'" says Randy Mead, a game designer at I.G.T. The games also include periodic free spins and other gimmicks designed, as Mead puts it, "to give players time for a small break -- to light a cigarette, order a drink, to stand and stretch."

"Joe brought this way of thinking, Look, we've got to wow them," says Dave Forshey, a graphic designer who arrived at I.G.T. shortly before Kaminkow. "It's not just push the red button and watch the wheels spin. Make people want to sit there. Use sight and sound and everything at our disposal to get people's juices going." Before Kaminkow's arrival, I.G.T.'s games weren't quiet -- hardly -- but they didn't take full advantage of the power of special effects like "smart sounds" -- bright bursts of music. So Kaminkow decreed that every action, every spin of the wheel, every outcome, would have its own unique sound. The typical slot machine featured maybe 15 "sound events" when Kaminkow first arrived at I.G.T.; now that average is closer to 400. And the deeper a player gets into a game, the quicker and usually louder the music.

"I'm not sure players even notice," says Bill Hecht, I.G.T.'s top sound designer, "but the effect is to get them more excited." Every time the reels spin on "Jeannie," a player hears a few seconds of the show's theme song, and Hecht even orchestrated a bossa nova rendition heard only when someone reaches the bonus round. "Something for the regular players to look forward to," he says. "We want to get your heart rate going a little."

It wasn't Kaminkow who devised what are called multiline games -- multicoin games that allow you to win on 1, 15 or 25 lines, assuming you wager enough coins. (Picture an enlarged tic tac toe board that lets you win in any number of crazy zigzag ways.) But under his stewardship, I.G.T. has taken full advantage of whatever design changes have allowed penny and nickel games to earn like dollar machines. "It used to be that the goal of casinos was to move their nickel players to quarters, the quarter players to dollars, the dollar players to five dollars," Baerlocher says. "Now they don't bother, because we've figured out how to get nickel and even penny machines to play like dollar machines." How? By offering jackpots in the hundreds of thousands, if not millions, of dollars. A penny machine like I.G.T.'s "Beverly Hillbillies" can be played for a penny a spin, but in most jurisdictions you're eligible for the big prize, which starts at \$200,000, only if you wager the maximum bet per spin of \$2.50. The odds of winning that big jackpot may be in the tens of millions to one, but there's a 100 percent chance you'll be kicking yourself for eternity if you see five Beverly Hillbillies line up on the machine's reels after you bet less than the maximum needed to win. "The truth is, nowadays you can lose more money faster

on a nickel slot machine than at a \$10 blackjack table," says Nigel Turner, a scientist at the Center for Addiction and Mental Health in Toronto. The true brilliance of the industry's emphasis on nickel and penny machines is perhaps best seen by comparing how much of "the handle," or the total amount wagered, they pay out compared with dollar machines. The average nickel machine pays back to winners somewhere between 88 and 92 percent of the money wagered, Baerlocher says, compared with the roughly 95 percent that dollar machines pay out.

Early on, Kaminkow's secretary, Pam Foster, told him, "The way you spend money, you'd better be good." Apparently all the millions he spent have paid off. By the time I first visited I.G.T., in 2002, the company had a 70 percent share of the domestic slot market, and Kaminkow no longer saw himself as competing against Bally, WMS Gaming and the Australian-based Aristocrat so much as competing for the attention of the tens of millions of Americans who had yet to discover the magic of his slot machines. Although the number of men who are playing the slots is increasing, they tend to be on the far side of 60, and women in their late 50's still represent the slot machine's most trustworthy devotees. So Kaminkow is devoting a sizable portion of his time to what he benignly calls "expanding his market." To appeal to a younger, male cohort, he signed licensing deals with the people behind "South Park" and "Austin Powers" (with mixed results) and then negotiated the even bigger deals with Drew Carey and George Lucas for "Star Wars." At the same time, he has been pursuing the potential of the Latino market by designing a line of games that lets gamblers play in Spanish with the push of a button. "I want my competitors to cry when they see my new games," he says. "I want them unable to get out of bed because they realize, Damn, they've done what we didn't even think possible."

The makers of slot machines may rely on the lure of life-changing jackpots to attract customers, but the machines' ability to hook so deeply into a player's cerebral cortex derives from one of the more powerful human feedback mechanisms, a phenomenon behavioral scientists call infrequent random reinforcement, or "intermittent reward." Children whose parents consistently shower them with love and attention tend to take that devotion for granted. Those who know they'll never be rewarded by their parents stop trying after a while. But those who are rewarded only intermittently -- in the fashion of a slot machine -- will often pursue positive outcomes with a persistent tenacity. "That hard-wiring that nature gave us didn't anticipate electronic gaming devices," says Howard Shaffer, director of the division on addictions at Harvard Medical School and perhaps the country's foremost authority on gambling disorders.

"The slot machine is brilliantly designed from a behavioral psychology perspective," says Nancy Petry, a professor of psychiatry at the University of Connecticut School of Medicine. "The people who are making these machines are using all the behavioral techniques to increase the probability that the behavior of gambling will reoccur." She refers to intermittent reward and "second-order conditioning" -- the lights and sounds that go off when a player wins, for example, or the two cherries in a row that convinces people they're getting closer.

"No other form of gambling manipulates the human mind as beautifully as these machines," concludes Petry, who has studied gambling treatments since 1998. "I think that's why that's the most popular form of gambling with which people get into trouble."



Anti-gambling activists refer to slots as "the crack cocaine of gambling." Though gambling's loudest critics tend to be alarmists, the crack analogy may be apt. Just as crack addicts have frequently seemed to self-destruct much faster than those abusing powdered cocaine, there is abundant, albeit still largely anecdotal, evidence suggesting that the same is true of today's computer-driven slot machines -- video-based slots especially. Where social workers once found that the woes of a typical problem gambler tended to mount gradually -- with a period of 20 or more years commonly passing between a first wager and a bottoming-out event like bankruptcy, divorce or even suicide -- addiction cycles of a few years are, if not typical, commonplace among slots players.

"Treatment folks are definitely identifying people who are experiencing what we call 'telescoping' -- a shortening of the period of time that it takes for someone to get into trouble," says Rachel Volberg, president of the National Council on Problem Gambling and the author of "When the Chips Are Down: Problem Gambling in America." Volberg, who runs Gemini Research, an organization that specializes in gambling-related investigations, says it remains to be seen whether the problem lies in "something special about these machines or in the people who prefer playing them." Female slots players in particular, Petry says, "tend to experience this telescoping phenomenon -- and we know from research that women are quicker to seek treatment."

Gambling counselors regularly encounter people like Ricky Brumfield, a working-class Phoenix woman who won \$3,700 the first time she ever touched a slot machine -- a day that turned out to be the unluckiest of her life. That was in 1997, when Brumfield, then 43, traveled to Las Vegas to help a friend celebrate the Fourth of July. Within nine months, she had hocked her jewelry and gone through \$100,000 in cash and credit-card debt. She only stopped, she confesses, because the Sheriff's Department arrested her on child-abuse charges for leaving her two young kids locked in a car in a casino parking lot while she played the slots inside. "I knew it was really wrong to do that, but the urge to go into the casino was stronger than my instincts as a mother," Brumfield says. She had only recently had back surgery, but she found that when she played, she never felt pain. "I think the dopamine and serotonin levels, when they kicked in -- that blocked off the pain," says Brumfield, who now works for the Arizona Council on Compulsive Gambling. "You feel hypnotized by the machine. You don't think of anything else." Near the end, the hold the machines had over her, she says, was akin to that of an unfaithful lover. She would fall into a jealous rage when a favorite machine paid a jackpot to another, less devoted player.

"Slot machines have a different impact on the brain than other forms of gambling," Howard Shaffer says. Unlike table games, which are played in groups, slots are played in isolation, and therefore they lack the same safeguards social situations provide. "And because the video form is faster than the mechanical form, they hold the potential to behave in the fashion of psychostimulants, like cocaine or amphetamines. They energize and de-energize the brain in more rapid cycles. The faster on, faster off, the greater the risk." Colleagues of Shaffer have compared the brain scans of people high on cocaine with those of people while gambling: similar neurocircuitry is lighted up in both sets of images.

Shaffer predicts that in time electronic games will "protect players." Just as the car industry implemented basic technologies like seat belts to save lives, he expects the gambling industry

(which finances many of his studies) to eventually employ strategies to interrupt people when they play too fast. As Bill Eadington, the University of Nevada, Reno, professor and a consultant to Indian tribes, governments and casinos around the world, puts it, "I worry that we're burning out players too fast."

The typical slots player initiates a new game every six seconds. That works out to 10 games per minute, 600 per hour. If the average player bets \$2 a spin, that player is wagering roughly \$1,200 every hour. Slot designers have experimented with machines that play even faster, but the industry standard remains a six-second cycle. "It wouldn't be much fun if we took your money any faster than that," Kaminkow told me with a slight shrug of his shoulder, suggesting that just how fast people play is entirely up to him.

I asked Kaminkow if he ever worried that the potent mix of TV, technology and the prodigious talents of his creative people will produce machines that are too powerful. "What kind of question is that?" he replied. In his natural state, Kaminkow is a breezy and sarcastic jokester who revels in politically incorrect jokes. But he suddenly sounded as if he were addressing a Rotary Club. "I take responsible gaming very seriously," he said. "We're not an alcohol, we're not a drug." He is in the entertainment business, he added, a "maker of small little movies" that bring a touch of joy and laughter to the lives of the elderly and others.

"I'm not looking for people who say, 'I spent my milk money,'" he said. "I think people need to be very responsible in their gaming habits. I know I am." The million-plus-square-foot facility that houses I.G.T.'s Reno operations sits in the Sierra foothills south of downtown. Workers use bicycles and golf carts to get around a complex that is larger than the Reno airport. Roughly 1,600 employees staff the nine assembly lines that I.G.T. operates for two shifts a day, five days a week. The warehouse where parts are stored evokes the government warehouse in the final scene from "Raiders of the Lost Ark." Maybe most impressive of all is what the company calls its finished goods area: hundreds of gleaming machines are stacked in row after row of shelves that reach several stories high.

"My job is basically to keep feeding the beast," Kaminkow likes to say, and toward that end he summoned a group of his top designers to his office in the fall of 2002 to discuss a game he was then calling "Mega Money Ball." He loved the idea of a lottery-themed game that gave the illusion of costing just a penny to play, and he needed a big name to ensure that it was a hit. The group considered some of the company's regulars, like Dick Clark and Regis Philbin, who was already under contract with I.G.T. for two games, and also Max Baer Jr. (Jethro), who had three games, with several more on the way. Eventually Kaminkow decided they needed a comedian. Dennis Miller (too angry) and Jerry Seinfeld (too expensive) were among the names bandied about before Kaminkow suddenly bellowed, "Nancy!" The name that had just crossed his mind was Drew Carey; Kaminkow was so excited that he ignored the group and yelled for Nancy King, who runs the company's licensing program.

Negotiations with a celebrity's people sometimes stretch over months ("Let's just say a lot of C celebrities think they're A's," King says), but Carey proved easier than most. "I thought, Oh, it'd be fun to be involved in the making of a slot machine," Carey says, adding that he asked himself if it would hurt his chances of ever doing movies, a goal of his, and concluded that it would not.

"That's almost all the thought I put into it," he says. It helped, of course, that his was a multigame deal that several people inside the company confirmed is worth in the millions even before annual royalties are figured.

Every slot machine starts with Kaminkow. "Has Joe told you his prima donna rule?" several people had asked by the time Kaminkow shared it with me (and then repeated on successive visits). "I tell people I've got my one-prima-donna rule: there's room for only one prima donna here, and I've already got the job," he says. But when work began on the machine, the design team had received little direction from the boss beyond a broad-brush mandate to create an interesting lotterylike game that took full advantage of Carey's talents. "We get this pile of vagueness," Baerlocher says, "that we have to start making into a game." A core group of about a dozen people -- including Baerlocher and a junior mathematician, a couple of computer programmers and assorted artists and other creative types -- were assigned what was now being called "Big Balls of Cash." They all read Carey's book "Dirty Jokes and Beer" and then sat down to brainstorm. "Basically we throw a lot of stuff at the wall and see what sticks," says Randy Mead, the game designer charged with coordinating the multitude of moving parts that would become the Carey machine. "So many of our games are based on older themes that are perfect for our audience," Mead explains. "They're the same graphics, the same songs, the same voices that those ladies really desire." The Carey machine, though, offered a chance to work on "something much edgier and fun."

Given the size of Carey's contract, "Big Balls" had to be an important machine, important enough to slap a wholly visible wheel on it. From almost the beginning, Kaminkow's crew understood that the main bonus round would mimic those commercial-like TV spots in which numbered Ping-Pong balls are used to pick a winning lottery number. They dressed Carey in a tuxedo and filmed him standing beside a beautiful model in a low-cut dress. Given this premise and the elaborate staging, a spinning wheel would seem superfluous -- except that in the world of slot machine design, spinning wheels are never superfluous. Baerlocher likes to recount the time a man lined up the three "Wheel of Fortune" symbols on a \$1 machine. Bells rang, lights flashed and the machine locked up, as it is programmed to do whenever anyone hits the big jackpot. "The casino host comes over -- 'Congratulations, sir, you've won the big jackpot. We're going to get people here to verify it.' And he was like, 'Don't I get to spin the wheel?' He had just won over a million dollars, but all he wanted to do is spin the wheel."

There are two basic elements to any slot machine, Baerlocher says -- the art and the math: "The art is used to attract a player. That's our lure to get them to sit down and play. That's when the game math takes over." The math, he says, gives a game its personality. Baerlocher decided that "Big Balls" couldn't be a cherry dribbler, because it offered so bountiful a top prize, but he didn't want it to be as tight as a game called "Megabucks," which was already in casinos and which rarely rewarded players with any money unless it was bestowing multiple millions of dollars on some lucky soul. The Carey game, the creators decided, would pay some small and medium jackpots, but with nothing like the frequency of machines aimed at the neophyte gambler. "Our thinking was that people don't want to come to a machine advertising a multimillion bonus and walk away with a \$20 or \$40 win," Baerlocher says. The other big question confronting the design team was how often to initiate the bonus. Baerlocher was aiming for a bonus that would kick in once during every 10 to 15 minutes of play, but Kaminkow was pushing for something

that would hit more often. "That's Joe," Baerlocher says. "He wants a machine that pays a ton of small pays, lots of medium-size plays and a huge jackpot. In other words, he wants us to do the impossible."

Apparently Baerlocher accomplished just that. "Big Balls of Cash" was a huge hit at last year's G2E, along with "Star Wars" and "Elizabeth Taylor Dazzling Diamonds" (described in I.G.T.'s press materials as an "exciting new merchandise-dispensing game" that allows you to wear home your winnings). I.G.T.'s designers killed many of Carey's more candid wisecracks so as not to anger its most important customers -- the casino executives who will decide the machine's fate -- but there remained an undeniable bite to the machine just the same. The company took 150 new games to G2E, but there was often a wait to play one of the two "Big Balls" machines. They were "gaffed" -- rigged -- to go immediately to the bonus round, and over the three-day show it provided endless laughs for the slots floor directors looking for new stuff. "You've got a real winner here," person after person told Kaminkow, who hovered around his two big kahunas and "Dazzling Diamonds" like a proud father. ("Big Balls" is expected to make its debut in casinos at the end of this year or early in 2005.)

Most of the people I met inside I.G.T. told me they never played slot machines on their own time. Anthony Baerlocher turned out to be the exception rather than the rule. Kaminkow's wife, Kim, says she plays only "when Joe hands me \$20 and tells me I'm supposed to play some new machine." Even one corporate P.R. staff member couldn't resist shaking her head in disbelief as she described scenes of people lining up to play a new machine. "It was unfathomable to me," she told me. When I asked one I.G.T. artist if he ever plays, he acted as if I had insulted him. "Slots are for losers," he spat, and then, coming to his senses, begged me to consider that an off-the-record comment. "Big Balls of Cash" was designed to hold roughly 10 cents for every dollar played, but saying the obvious inside I.G.T. -- that the very math of the slot machine makes it a loser's game -- would not be a very good career move.

Every so often during my time inside I.G.T. someone let me into a locked showroom just off the building's main lobby. Inside, I would find myriad machines clamoring for my attention. They were in what slot designers describe as "attract mode." A "Dick Clark's New Year's Rockin' Eve" kept announcing, "It's a cold one in Times Square tonight." A voice that sounded vaguely like Yosemite Sam asked: "Do you want to be rich? Oil rich?" A familiar voice from my TV past cried out, "Come on down!" Applause emanated from a machine in the corner, and I heard Frank Sinatra's voice: "Thank you, ladies and gentlemen."

On my first visit to the showroom, I jumped from game to game, but on my second visit I stuck with a single game, "The Price Is Right," which Baerlocher designed expressly for the uninitiated. The showroom machine had 8,000 credits on it -- \$400. It wasn't my money, so I played the maximum of \$2.25 per spin. The machine constantly emitted noises: clapping sounds, little bright chimes, the occasional yodel. The show's theme song never stopped, driving me batty, until finally I hit a bonus -- suddenly that theme song turned sweet. Slot designers call it a "rolling sound": the more credits you win, the longer the song plays. At first I seemed to be winning, gathering credits on every second or third spin. But after about 15 minutes, I was down nearly 7,000 credits. I was winning the virtual equivalent of 15 or 20 nickels every time I scored

-- but I was spending more than twice that with every spin. After 45 minutes, I was down below 5,000 credits. If I were playing for real money, I would have lost more than \$150.

Playing free credits is nothing like playing with your own money, of course, so at 2 a.m. one sleepless night I slipped a 20-dollar bill into a "Jeannie" machine in the Sands casino in Reno. That bought me a full 25 minutes on the machine and one brief bonus glimpse of Jeannie. I'm pretty much the age of those Kaminkow is targeting with his newer machines -- and in fact I grew up dreaming of Jeannie -- but it's hard to imagine being seduced by any celebrity he might trot out, even Neil Young or Lou Reed.

My brief crack at slots left me feeling somewhere between stupid and glum. At that hour there were no cheery tourists in brightly-patterned shirts amid the chirping of the slots, no sunny smiles on the faces of elderly women happy for a few hours out on the town. Several machines down from me an older man sat slumped in his chair. His T-shirt was riding up his overabundant belly, but he didn't seem to care. He stared at the video screen in front of him in a toddler-staring-at-television kind of way. Other players around me were dressed in sweatsuits and slippers, and there was even a woman in curlers. The hairstyles were generally what you would expect if a fire alarm forced people out of bed in the middle of the night. It wasn't pleasure I saw on their faces so much as determination.

The scene called to mind an evening one year earlier when I spent time with several undercover cops who work for Colorado's division of gambling. Walking the casinos of Black Hawk and Central City, a pair of side-by-side mountain towns with dozens of casinos, we came across a woman who had just won \$5,000 playing a dollar slot machine. The people at the Isle of Capri Casino had trotted out a photographer and an oversize poster-board check, but the woman wasn't smiling. In fact, she looked sad. "I'll tell you," said Michael Lask, one of the undercover officers, "she probably lost \$10,000 to win that \$5,000. And she knows that next week she'll be giving that \$5,000 right back." For the most part, the only smiling faces I saw while delving into the realm of slot machines were on the faces of I.G.T.'s designers, unless you count the players posing on the oversize pictures that hang in the atrium of the company's entrance.

*Gary Rivlin covers Silicon Valley for The New York Times. He is the author of "The Plot to Get Bill Gates."*