# Video game crash of 1983

The **video game crash of 1983** (known as the **Atari shock** in Japan) was a large-scale recession in the video game industry that occurred from 1983 to 1985, primarily in the United States. The crash was attributed to several factors, including market saturation in the number of game consoles and available games, as well as waning interest in console games in favor of personal computers. Revenues peaked at around $3.2 billion in 1983, then fell to around $100 million by 1985 (a drop of almost 97 percent). The crash abruptly ended what is retrospectively considered the second generation of console video gaming in North America, as well as weakened the arcade game market.

Lasting about two years, the crash shook a then-booming video game industry, and led to the bankruptcy of several companies producing home computers and video game consoles in the region. Analysts of the time expressed doubts about the long-term viability of video game consoles and software.

The North American video game console industry recovered a few years later, mostly due to the widespread success of Nintendo's Western branding for its Famicom console, the Nintendo Entertainment System (NES) in 1985. The NES was designed to avoid the missteps that caused the 1983 crash and the stigma associated with video games at that time.

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## Causes and factors

### Flooded console market

The Atari Video Computer System (renamed the Atari 2600 in late 1982) was not the first home system with swappable game cartridges, but by the early 1980s it was the most popular second-generation console by a wide margin. Launched in 1977 just ahead of the collapse of the market for home *Pong* console clones, the Atari VCS experienced modest sales for its first few years. In 1980, Atari's licensed version of *Space Invaders* from Taito became the console's killer application; sales of the VCS quadrupled, and the game was the first title to sell more than a million copies.[1][2] Spurred by the success of the Atari VCS, other consoles were introduced, both from Atari and other companies: Odyssey², Intellivision, ColecoVision, Atari 5200, and Vectrex. Notably, Coleco sold an add-on allowing Atari VCS games to be played on its ColecoVision, as well as bundling the console with a licensed home version of Nintendo's arcade hit *Donkey Kong*. In 1982, the ColecoVision held roughly 17% of the hardware market, compared to Atari VCS's 58%. This was the first real threat to Atari's dominance of the home console market.[3]

Atari VCS, also known as the Atari 2600, the most popular console prior to the crash.

Each new console had its own library of games produced exclusively by the console maker, while the Atari VCS also had a large selection of titles produced by third-party developers. In 1982, analysts marked trends of saturation, mentioning that the amount of new software coming in would only allow a few big hits, that retailers had devoted too much floor space to systems, and that price drops for home computers could result in an industry shakeup.[4]

In addition, the rapid growth of the videogame industry led to an increased demand, which the manufacturers over-projected. In 1983, an analyst for Goldman Sachs stated the demand for video games was up 100% from the previous, but the manufacturing output had increased by 175%, creating a significant surplus. Atari CEO Raymond Kassar recognized in 1982 that the industry's saturation point was imminent. However, Kassar expected this to occur when about half of American households had a video game console. Unfortunately, the crash occurred when about 15 million machines had been sold, which soundly under-shot Kassar's estimate.[5]

## Loss of publishing control

Prior to 1979, there were no third-party developers, with console manufacturers like Atari publishing all the games for their respective platforms. This changed with the formation of Activision in 1979. Activision was founded by four Atari programmers who left the company because they felt that Atari's developers should receive the same recognition and accolades (specifically in the form of sales-based royalties and public-facing credits) as the actors, directors, and musicians working for other subsidiaries of Warner Communications (Atari's parent company at the time). Already being quite familiar with the Atari VCS, the four programmers developed their own games and cartridge manufacturing processes. Atari quickly sued to block sales of Activision's products, but failed to secure a restraining order, and ultimately settled the case in 1982. While the settlement stipulated that Activision must pay royalties to Atari, this case ultimately legitimized the viability of third-party game developers. Activision's games were as popular as Atari's, with *Pitfall!* (released in 1982) selling over 4 million units.

Prior to 1982, Activision was one of only a handful of third parties publishing games for the Atari VCS. The others included Imagic, Games by Apollo, Coleco, Parker Brothers, CBS Video Games, and Mattel. By 1982, Activision's success emboldened numerous other competitors to penetrate the market. However, Activision's founder David Crane observed that several of these companies were supported by venture capitalists attempting to emulate the success of Activision. Without the experience and skill of Activision's team, these inexperienced competitors mostly created games of poor quality.[6] Crane notably described these as "the worst games you can imagine".[7] While Activision's success could be attributed to the team's existing familiarity with the Atari VCS, other publishers had no such advantage. They largely relied on industrial

espionage (poaching each other's employees, reverse-engineering each other's products, etc) in their attempts to gain market share. In fact, even Atari themselves engaged in such practices, hiring several programmers from Mattel's Intellivision development studio, prompting a lawsuit that included charges of industrial espionage.

The rapid growth of the third-party game industry was easily illustrated by the number of vendors present at the semi-annual Consumer Electronics Show (CES). According to Crane, the number of third-party developers jumped from 3 to 30 between two consecutive events.[7] At the Summer 1982 CES,[8] there were 17 companies, including MCA Inc., and Fox Video Games announcing a combined 90 new Atari games.[9] By 1983, an estimated 100 companies were attempting to leverage the CES into a foothold in the market. *AtariAge* documented 158 different vendors that had developed for the Atari VCS.[10] In June of 1982, the Atari games on the market numbered just 100. By December, that number grew to over 400.

Experts predicted a glut in 1983, with only 10% of games producing 75% of sales.[11]

*BYTE* stated in December that "in 1982 few games broke new ground in either design or format ... If the public really likes an idea, it is milked for all it's worth, and numerous clones of a different color soon crowd the shelves. That is, until the public stops buying or something better comes along. Companies who believe that microcomputer games are the hula hoop of the 1980s only want to play Quick Profit."[12] Bill Kunkel said in January 1983 that companies had "licensed everything that moves, walks, crawls, or tunnels beneath the earth. You have to wonder how tenuous the connection will be between the game and the movie *Marathon Man*. What are you going to do, present a video game root canal?"[13] By September 1983 the *Phoenix* stated that 2600 cartridges "is no longer a growth industry".[14] Activision, Atari, and Mattel all had experienced programmers, but many of the new companies rushing to join the market did not have the expertise or talent to create quality games. Titles such as Ralston Purina's dog food-themed *Chase the Chuckwagon*, the *Kaboom!*-like *Lost Luggage*, rock band tie-in *Journey Escape*, and plate-spinning game *Dishaster*, were examples of games made in the hopes of taking advantage of the video-game boom, but later proved unsuccessful with retailers and potential customers.

## Lack of consumer confidence

Prior to 1982, Atari was considered the dominant company in the home video game industry, but as described above, new players in the hardware market and the loss of publishing control caused the company to slip from its dominant position.[3] During 1982, Atari took several missteps in trying to regain its dominance that caused the market and consumers to lose confidence in the company and in turn the video game industry as a whole.[15]

One factor was around certain games Atari chose to publish, as by this point, with the company owned by Warner Communication, it was more focused on business opportunities rather than innovation. Many of its executives were MBAs, and looked for any business opportunity that would give them an edge over other third-party game publishers.[15] Coleco's deal with Nintendo for *Donkey Kong* was a major threat to Atari.[3] Atari had had past success with its own licenses of arcade hits ported to the Atari VCS, but also had begun to look for other lucrative licensing opportunities that they could differentiate themselves from other companies.[16] Two games released in 1982, often cited as major contributors to the crash, were part of the factors that contributed to weakening Atari's consumer confidence: *Pac-Man*, and *E.T. the Extra-Terrestrial*. The Atari VCS port of the arcade hit *Pac-Man* was released in March 1982 and was critically panned, with its graphics cited as particularly poor. While some vendors canceled orders, most of the large retailers continued to sell the game, and Atari sold seven million units in 1982. Still, the quality issues hurt the Atari brand and led some consumers to ask for refunds.[15] *E.T. the Extra-Terrestrial* was developed by Howard Scott Warshaw in only six weeks under rush orders at Atari's direction to meet the sales for the 1982 Christmas season after Atari

had secured the rights to the film for about US$20 to 25 million. Atari anticipated about four million units to be sold, but the quality of the game due to the time constraints stalled sales, and a reported 3.5 million units were returned to Atari.[17]

The combined impact of the poor quality of *Pac-Man* and *E.T.* reflected on Atari as it caused consumers to become wary of the company's future products, leading to a slowdown in sales entering 1983. Atari attempted to improve future arcade and licensed game ports to draw back consumers, such as the *Ms. Pac-Man* port which was more positively received by critics.[17] However, they were unable to capture similar sales numbers as prior to 1982.[15]

## Competition from home computers

The Commodore 64 survived the crash and became one of the best-selling computers of all time.

Inexpensive home computers had been first introduced in 1977 and, by 1979, Atari unveiled the Atari 400 and 800 computers, built around a chipset originally meant for use in a game console, and which retailed for the same price as their respective names. In 1981, IBM introduced the IBM 5150 PC with a $1,565 base price[18] (equivalent to $4,401 in 2019), while Sinclair Research introduced its low-end ZX81 microcomputer for £70 (equivalent to £270 in 2019). By 1982, new desktop computer designs were commonly providing better color graphics and sound than game consoles and personal computer sales were booming. The TI 99/4A and the Atari 400 were both at $349 (equivalent to $925 in 2019), the Tandy Color Computer sold at $379 (equivalent to $1,004 in 2019), and Commodore International had just reduced the price of the VIC-20 to $199 (equivalent to $527 in 2019) and the C64 to $499 (equivalent to $1,322 in 2019).[19][20]

Because computers generally had more memory and faster processors than a console, they permitted more sophisticated games. A 1984 compendium of reviews of Atari 8-bit software used 198 pages for games compared to 167 for all other software types.[21] Home computers could also be used for tasks such as word processing and home accounting. Games were easier to distribute, since they could be sold on floppy disks or cassette tapes instead of ROM cartridges. This opened the field to a cottage industry of third-party software developers. Writeable storage media allowed players to save games in progress, a useful feature for increasingly complex games which was not available on the consoles of the era.

In 1982, a price war that began between Commodore and Texas Instruments led to home computers becoming as inexpensive as video-game consoles;[22] after Commodore cut the retail price of the 64 to $300 in June 1983, some stores began selling it for as little as $199.[14] Dan Gutman, founder in 1982 of *Video Games Player* magazine in an article in 1987, recalled in 1983 that "People asked themselves, 'Why should I buy a video game system when I can buy a computer that will play games and do so much more?'"[23] *The Boston Phoenix* stated in September 1983 about the cancellation of the Intellivision III, "Who was going to pay $200-plus for a machine that could only play games?"[14] Commodore explicitly targeted video game players. Spokesman William Shatner asked in VIC-20 commercials "Why buy just a video game from Atari or Intellivision?", stating that "unlike games, it has a real computer keyboard" yet "plays great games too".[24] Commodore's ownership of chip fabricator MOS Technology allowed manufacture of integrated circuits in-house, so the VIC-20 and C64 sold for much lower prices than competing home computers.

"I've been in retailing 30 years and I have never seen any category of goods get on a self-destruct pattern like this", a Service Merchandise executive told *The New York Times* in June 1983.[22] The price war was so severe that in September Coleco CEO Arnold Greenberg welcomed rumors of an IBM 'Peanut' home computer because although IBM was a competitor, it "is a company that knows how to make money". "I look back a year or two in the videogame field, or the home-computer field", Greenberg added, "how much better

everyone was, when most people were making money, rather than very few".[25] Companies reduced production in the middle of the year because of weak demand even as prices remained low, causing shortages as sales suddenly rose during the Christmas season;[26] only the Commodore 64 was widely available, with an estimated more than 500,000 computers sold during Christmas.[27] The 99/4A was such a disaster for TI, that the company's stock immediately rose by 25% after the company discontinued it and exited the home-computer market in late 1983.[28] JC Penney announced in December 1983 that it would soon no longer sell home computers, because of the combination of low supply and low prices.[29]

By that year, Gutman wrote, "Video games were officially dead and computers were hot". He renamed his magazine *Computer Games* in October 1983, but "I noticed that the word *games* became a dirty word in the press. We started replacing it with *simulations* as often as possible". Soon "The computer slump began ... Suddenly, everyone was saying that the home computer was a fad, just another hula hoop". *Computer Games* published its last issue in late 1984.[23] In 1988, *Computer Gaming World* founder Russell Sipe noted that "the arcade game crash of 1984 took down the majority of the computer game magazines with it." He stated that, by "the winter of 1984, only a few computer game magazines remained," and by the summer of 1985, *Computer Gaming World* "was the only 4-color computer game magazine left."[30]

# Result

## Immediate effects

The release of so many new games in 1982 flooded the market. Most stores had insufficient space to carry new games and consoles. As stores tried to return the surplus games to the new publishers, the publishers had neither new products nor cash to issue refunds to the retailers. Many publishers, including Games by Apollo[31] and US Games,[32] quickly folded. Unable to return the unsold games to defunct publishers, stores marked down the titles and placed them in discount bins and sale tables. Recently released games which initially sold for US$35 (equivalent to $92 in 2018) were in bins for $5 ($13 in 2018).[32][33]

The presence of third-party sales drew the market share that the console manufacturers had. Atari's share of the cartridge-game market fell from 75% in 1981 to less than 40% in 1982, which negatively affected their finances.[34] The bargain sales of poor-quality titles further drew sales away from the more successful third-party companies like Activision due to uneducated consumers being drawn by price to purchase the bargain titles rather than quality. By June 1983, the market for the more expensive games had shrunk dramatically and was replaced by a new market of rushed-to-market, low-budget games.[35] Crane said that "those awful games flooded the market at huge discounts, and ruined the video game business".[36]

A massive industry shakeout resulted. Magnavox abandoned the video game business entirely. Imagic withdrew its IPO the day before its stock was to go public; the company later collapsed. Activision, to stay competitive and maintain financial security, began development of games for the personal computer. Within a few years, Activision no longer produced cartridge-based games and focused solely on personal computer games.[35]

Atari was one of those companies most affected by the crash. As a company, its revenues dropped significantly due to dramatically lower sales and cost of returned stock. By mid-1983, the company had lost US$356 million and was forced to lay off 3,000 of its 10,000 worker staff. Unsold *Pac-Man*, *E.T. the Extra-Terrestrial*, and other 1982 and 1983 games and consoles started to fill their warehouses. In September 1983, Atari discreetly buried much of this excess stock in a landfill near Alamogordo, New Mexico, though Atari did not comment about their activity at the time. Misinformation related to sales of *Pac-Man* and *E.T.* led to an urban legend of the Atari video game burial that millions of unsold cartridges were buried there. Gaming historians received permission to dig up the landfill as part of a documentary in 2014, during which former Atari executive James Heller, who had overseen the original burial clarified that only about 728,000 cartridges

had been buried in 1982, backed by estimates made during the excavation, and disproving the scale of the urban legend.[37] Atari's burial remains an iconic representation of the 1983 video game crash.[38][39][40] By the end of 1983, Atari had over US$536 million in losses, leading to Warner Communication to sell Atari to Jack Tramiel of Commodore International in July 1984, which directed Atari's efforts into developing their personal computer line, the Atari ST, over the console business.[15]

Partially-surviving cases and cartridges retrieved during the 2014 excavation of the Alamogordo, New Mexico landfill Atari had used in 1983. *E.T.*, *Centipede*, and other Atari materials can be seen.

Lack of confidence in the video game sector caused many retailers to stop selling video game consoles or reduced their stock significantly, reserving floor or shelf space for other products. This was the most formidable barrier that confronted Nintendo, as it tried to market its Famicom system in the United States. Retailer opposition to video games was directly responsible for causing Nintendo to brand its product an *"Entertainment System"* rather than a *"console"*, using terms such as *"control deck"* and *"Game Pak"*, as well as producing a toy robot called *R.O.B.* to convince toy retailers to allow it in their stores. Furthermore, the design for the Nintendo Entertainment System (NES) used a front-loading cartridge slot to mimic how videocassette recorders, popular at that time, were loaded, further pulling the NES away from previous console designs.[41][42][43]

The crash also affected video game arcades, which had had several years of a golden age since the introduction of *Space Invaders* in 1978 but was waning by 1982 due to the expansion of home consoles, the lack of novel games, and undue attention to teenage delinquency around video game arcades.[15] While the number of arcades in the United States had doubled to 10,000 from 1980 to 1982, the crash led to a closure of around 1,500 arcades, and revenues of those that remained open had fallen by 40%.[5]

The full effects of the industry crash were not felt until 1985.[44] Despite Atari's claim of 1 million in worldwide sales of its 2600 game system that year,[45] recovery was slow. The sales of home video games had dropped from $3.2 billion in 1982[46] to $100 million in 1985.[47] Analysts doubted the long-term viability of the video game industry,[48] but following the release of the Nintendo Entertainment System, the industry began recovering, with annual sales exceeding $2.3 billion by 1988, with 70% of the market dominated by Nintendo.[49] In 1986, Nintendo president Hiroshi Yamauchi noted that "Atari collapsed because they gave too much freedom to third-party developers and the market was swamped with rubbish games". In response, Nintendo limited the number of titles that third-party developers could release for their system each year, and promoted its "Seal of Quality", which it allowed to be used on games and peripherals by publishers that met Nintendo's quality standards.[50]

The end of the crash allowed Commodore to raise the price of the C64 for the first time upon the June 1986 introduction of the Commodore 64c—a Commodore 64 redesigned for lower cost of manufacture—which *Compute!* cited as the end of the home-computer price war,[51][52] one of the causes of the crash.[53]

## Long-term effects

Global revenues of the video game industry from 1978 to 1990, not adjusted for inflation.[54] The 1983 crash had rippling effects across the video game industry.

The crash in 1983 had the largest impact in the United States, and rippled through all sectors of the global video game market worldwide, though sales of video games still remained strong in Japan, Europe, and Canada from the beleaguered American companies.[55] It

took several years for the U.S. industry to recover. The estimated US$42 billion worldwide market in 1982, including consoles, arcade, and personal computer games, dropped to US$14 billion by 1985, with a significant shift away from arcades and consoles to personal computer software in the years that followed.[54]


Famicom

After the crash occurred some changes were made to the North American model (Famicom) of the NES. The console itself was engineered to look like anything but a game system. Nintendo wanted it to look more so as a regular home tech item such as a VCR rather than a gaming console. Nintendo's thought process was that with the crash just ending and having a toll on the gaming industry and also its consumers that it would go for a look that was opposite of what it is made to be. Nintendo was afraid that people would be a bit wary after the events and would not want a console in their homes. The company even went as far as avoiding the words "video game" and "software" when referring to the console. The NES's design helps people make the association between 8-bit gaming and classic gaming.[56]

1984 is when some of the longer-term effects started to take a toll on the video game console. Companies like Magnavox had decided to pull out of the video game console industry. With the sales being so little and businesses not getting a good enough return on their sales they also started to abandon the video game industry. The general consensus was that video games were just a fad that came as quickly as they left. But outside of North America the video game industry was doing very well. Home consoles were growing in popularity in Japan while home computers were surging across Europe. In 1984 Warner Communications brought a struggling company that they ended up selling 18 months later to Jack Tramiel.[57] Not long after, he renamed the company Atari Corp.

United States sales fell from $3 billion to around $100 million in 1985. Despite the decline, new gaming companies started to make their way onto the scene such as Westwood Studios, Code Masters, and Square All which all started in 1985. All of these companies would go on to create numerous genre-defining titles in the future.[58] During the holiday season of 1985 Hiroshi Yamauchi decided to go to New York small markets about putting their products in their stores. Minoru Arakawa offered a money back guarantee from Nintendo that they would pay back for any stock that was left unsold. In total Nintendo sold 50,000 units, about half of the units they shipped to the US.[59]

### Japanese dominance

The U.S. video game crash had two long-lasting results. The first result was that dominance in the home console market shifted from the United States to Japan. The crash did not directly affect the financial viability of the video game market in Japan, but it still came as a surprise there and created repercussions that changed that industry, and thus became known as the "Atari shock".[60]

As the crash was happening in the United States, Japan's game industry started to shift its attention from arcade games to home consoles. Within one month in 1983, three new home consoles were released in Japan: the Nintendo Famicom (two years later released in Western markets as Nintendo Entertainment System (NES)), Sega's SG-1000, and Microsoft Japan's MSX hybrid computer-console system, all heralding the third generation of home consoles.[61] These three consoles were extremely popular, buoyed by an economic bubble in Japan. The units readily outsold Atari and Mattel's existing systems, and with both Atari and Mattel focusing on recovering domestic sales, the Japanese consoles effectively went uncontested over the next few years.[61] By 1986, three years after its introduction, 6.5 million Japanese homes—19% of the population—

owned a Famicom, and Nintendo began exporting it to the U.S., where the home console industry was only just recovering from the crash.[50] By 1987 the Nintendo Entertainment System was very popular in North America.[62]

By the time the U.S. video game market recovered in the late 1980s, the NES was by far the dominant console in the United States, leaving only a fraction of the market to a resurgent Atari. By 1989, home video game sales in the United States had reached $5 billion, surpassing the 1982 peak of $3 billion during the previous generation. A large majority of the market was controlled by Nintendo; it sold more than 35 million units in the United States, exceeding the sales of other consoles and personal computers by a considerable margin.[63] Other Japanese companies also rivaled Nintendo's success in the United States, with NEC's PC Engine/TurboGrafx 16 in 1989 and Sega's Mega Drive/Genesis released the same year. The latter console's release set the stage for a major console war of market dominance between Sega and Nintendo in the late 1980s and early 1990s as the United States market recovered from the crash.

Following the crash, Nintendo became the market leader in America with the Nintendo Entertainment System (top), with Japanese companies dominating the market for years to come. The Sega Genesis (bottom) released in 1988 was the first real challenger to Nintendo's market dominance in North America.

### Impact on third-party software development

A second, highly visible result of the crash was the advancement of measures to control third-party development of software. Using secrecy to combat industrial espionage had failed to stop rival companies from reverse engineering the Mattel and Atari systems and hiring away their trained game programmers. While Mattel and Coleco implemented lockout measures to control third-party development (the ColecoVision BIOS checked for a copyright string on power-up), the Atari 2600 was completely unprotected and once information on its hardware became available, little prevented anyone from making games for the system. Nintendo thus instituted a strict licensing policy for the NES that included equipping the cartridge and console with lockout chips, which were region-specific, and had to match in order for a game to work. In addition to preventing the use of unlicensed games, it also was designed to combat software piracy, rarely a problem in North America or Western Europe, but rampant in East Asia.

Accolade achieved a technical victory in one court case against Sega, challenging this control, even though it ultimately yielded and signed the Sega licensing agreement. Several publishers, notably Tengen (Atari), Color Dreams, and Camerica, challenged Nintendo's control system during the 8-bit era by producing unlicensed NES games. The concepts of such a control system remain in use on every major video game console produced today, even with fewer "cartridge-based" consoles on the market than in the 8/16-bit era. Replacing the security chips in most modern consoles are specially encoded optical discs that cannot be copied by most users and can only be read by a particular console under normal circumstances.

Initially, Nintendo was the only developer for the Famicom. Under pressure from Namco and Hudson Soft, it opened the Famicom to third-party development, but instituted a license fee of 30% per game cartridge for these third-parties to develop games, a system used by console manufactures to this day.[64] Nintendo maintained strict manufacturing control and requiring payment in full before manufacturing. Cartridges could not be returned to Nintendo, so publishers assumed all the financial risk of selling all units ordered. Nintendo limited most third-party publishers to only five games per year on its systems (some companies tried to get around this by creating additional company labels like Konami's Ultra Games label); Nintendo ultimately dropped this rule by 1993 with the release of the Super Nintendo Entertainment System.[65] Nintendo's strongarmed oversight of Famicom cartridge manufacturing led to both legitimate and bootleg unlicensed

cartridges to be made in the Asian regions. Nintendo developed its golden seal of approval on all licensed games released for the system to try to promote authenticity and detract from bootleg sales, but failed to make significant traction to stalling these sales.[66]

As Nintendo prepared to release the Famicom in the United States, it wanted to avoid both the bootleg problem it had in Asia as well as the mistakes that led up to the 1983 crash. The company created the proprietary 10NES system, a lockout chip which was designed to prevent cartridges made without the chip from being played on the NES. The 10NES lockout was not perfect, as later in the NES's lifecycle methods were found to bypass it, but it did sufficiently allow Nintendo to strengthen its publishing control to avoid the mistakes Atari had made and initially prevent bootleg cartridges in the Western markets.[67] These strict licensing measures backfired somewhat after Nintendo was accused of antitrust behavior.[68] In the long run, this pushed many western third-party publishers such as Electronic Arts away from Nintendo consoles and supported competing consoles such as the Sega Genesis or Sony PlayStation. Most of the Nintendo platform-control measures were adopted by later console manufacturers such as Sega, Sony, and Microsoft, although not as stringently.

### Computer game growth

With waning console interests in the United States, the computer game market was able to gain a strong foothold in 1983 and beyond.[61] Developers that had been primarily in the console games space, like Activision, turned their attention to developing computer game titles to stay viable.[61] Newer companies also were founded to capture the growing interest in the computer games space with novel elements that borrowed from console games, as well as taking advantage of low-cost dial-up modems that allowed for multiplayer capabilities.[61]

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## Further reading

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## External links

- The Dot Eaters.com: "Chronicle of the Great Videogame Crash" (http://thedoteaters.com/?bitstory=the-great-video-game-crash)
- Twin Galaxies Official Video Game & Pinball Book of World Records: "The Golden Age of Video Game Arcades" (https://web.archive.org/web/20060618195311/http://www.twingalaxies.com/index.aspx?c=17) — *story within the 1998 book*.
- Intellivisionlives.com: Official Intellivision History (http://www.intellivisionlives.com/history.php) — *by the original programmers*.
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