



THE COMPLETE GUIDE TO

GAME DEVELOPMENT, ART & DESIGN

David McCarthy, Ste Curran and Simon Byron





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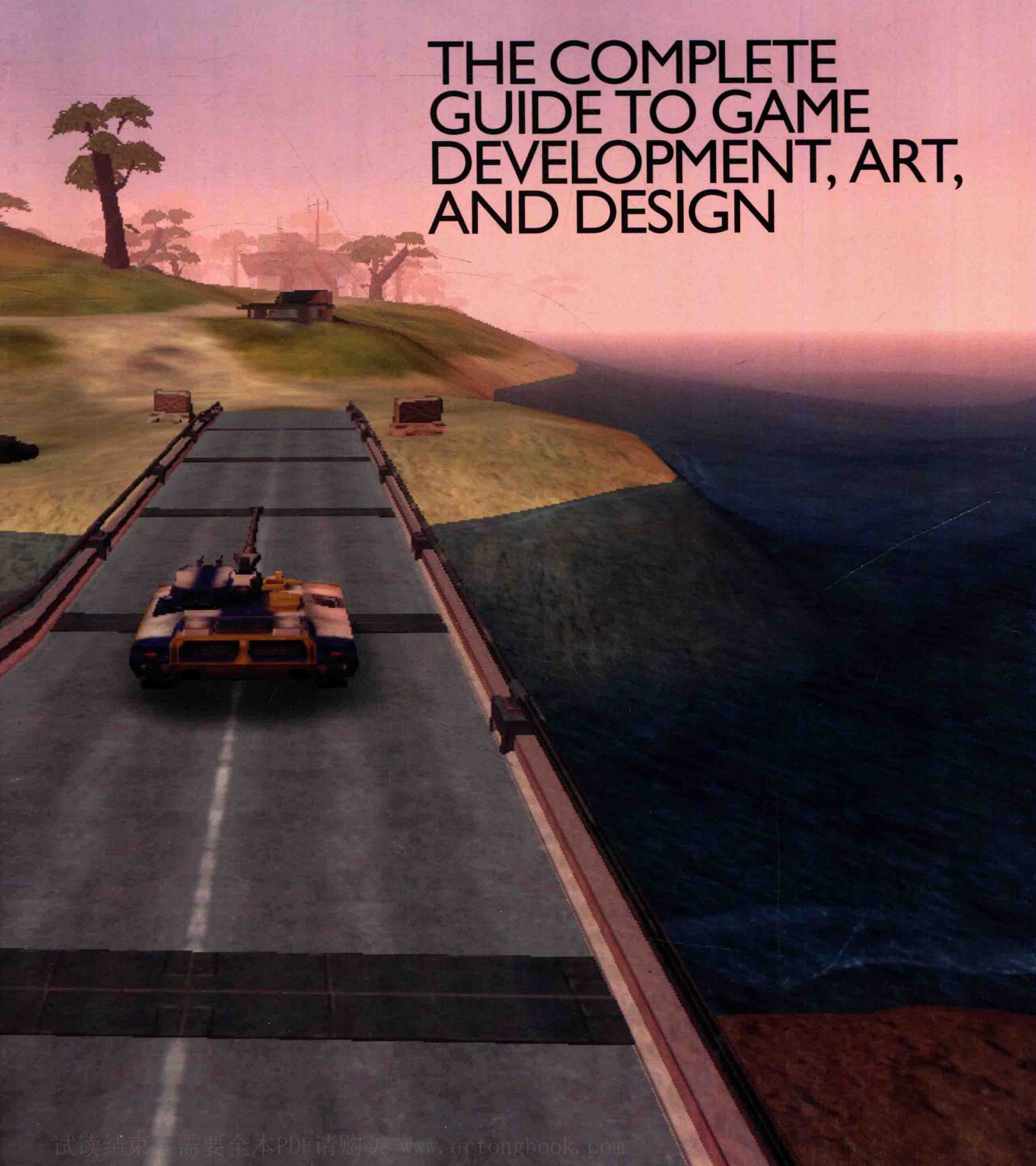
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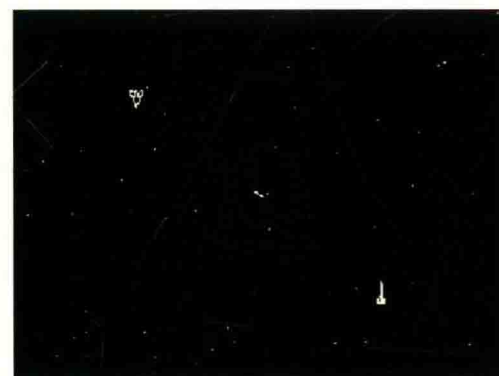
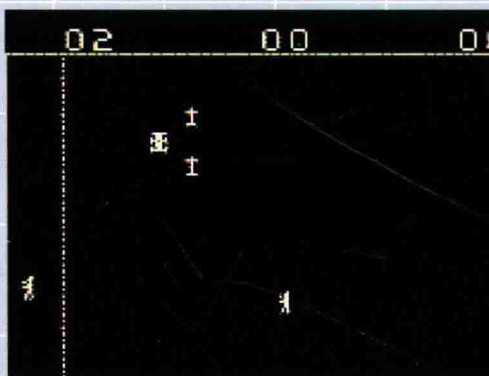
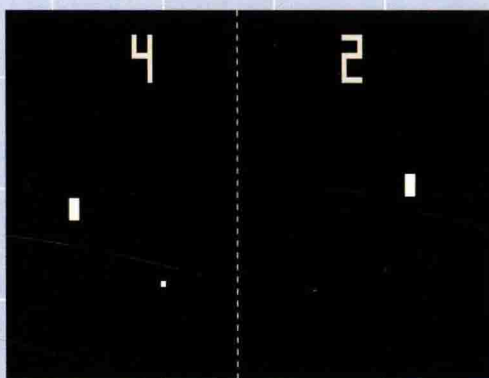
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INTRODUCTION



GAME DEVELOPMENT, ART, AND DESIGN

We have come a long way in 40 years. From room-sized machines with paper input, to sleek boxes of silicon; from the backrooms of universities and bedrooms of hobbyists, through to multi-million pound operations; from simple concepts sketched on the back of envelopes and then written in binary, to sprawling, multi-genre epics whose marketing budgets are often considered as crucial as their development costs. Videogaming is now a global, multi-billion pound industry, and it is still growing.

As the industry grows, the way that games are developed also becomes more sophisticated. *The Complete Guide to Game Development, Art, and Design* aims to give the reader an insight into that process, a disparate, multi-tiered art that is now as diverse and sophisticated as the movie industry, and that has budgets to match. Those who wish to get involved in the business of making games

– and more and more people are finding it an attractive and lucrative form of creative expression – should look no further for a guide to the skills that are required.

After all, this is no longer a medium where success requires a computer science degree, a collection of death metal records, and a fear of the outside world – a stereotype all but eliminated today.

The Complete Guide to Game Development, Art, and Design has five broad sections, and four of those offer opportunities for those who have never touched a line of code, much less devoted their lives to it. Programmers are still in demand, but the games industry today requires much, much more.

Following a look at the history of game design, the book begins with a look at the preproduction phase, where concepts are settled, budgets defined, tools chosen, and pitches produced.

THEN...

Opposite page,
clockwise from top left:

Pong, Atari, 1972

Manic Miner, Bug-Byte, 1983

Spacewar!, MIT, 1962

Death Race, Exidy, 1976



NOW...

Clockwise from top left:

Virtua Tennis 2K2, Sega, 2001

Super Mario Sunshine,

Nintendo, 2002

Eve Online: The Second Genesis,

Crucial, 2003

Grand Theft Auto: Vice City,

Rockstar, 2003



Production follows preproduction – assuming the pitch is accepted, of course – and here the programmers really are required, along with artists, writers, level designers, and audio experts. Milestones need to be hit, too, which means employing a producer, and adding another set of skills entirely.

Postproduction is next, which involves localizing the game for different countries, and proves not just a technical challenge, but a cultural one, too. This chapter of the book also looks at sequels and expansions, and the difficulties inherent in producing them. Finally, the business and financing side of the games industry is covered with chapters on marketing and PR, and the alternative models that are emerging for games development.

Interviews with leading games industry figures complement the chapters, and paint a comprehensive picture of

videogame construction in the 21st century. Those people already involved in making games will find *The Complete Guide to Game Development, Art, and Design* provides a succinct overview of the work that surrounds them every day, demonstrating just how crucial a role they play in this vast, intricate, constantly evolving machine. Those people who aren't will be shown the expertise that they will need to get into the games industry.

And who wouldn't want to do that? With the budgets for blockbuster games now approaching those of their Hollywood rivals, and the sales figures exceeding them, rewarding positions are on offer for workers across the employment spectrum. All this, and there is still so much creative space left to explore – it's an exciting place to be. *The Complete Guide to Game Development, Art, and Design* shows why. We hope you enjoy it.

A BRIEF INTRODUCTION TO GAME DEVELOPMENT

01

01.01

PART 01. A BRIEF
INTRODUCTION TO GAME
DEVELOPMENT

CHAPTER ONE



IN THE BEGINNING

If there is one place that everything in videogaming can be traced back to – one single point, genesis, the birthplace of the first videogame – then it is a computer laboratory at the Massachusetts Institute of Technology in 1962, home to four long-haired coders in their mid-twenties, and a PDP-1. The PDP-1 was, in essence, the first personal computer, albeit one the size of a room that required input in the form of reels of punched paper tape. The coders – Martin Graetz, Wayne Witaenem, and Stephen Russell – were pulp science fiction fans out to create a demonstration program that pushed the system to the limit. In an interview with *Edge* magazine, Graetz recalled the group's first conversation on the matter. 'Wayne said, "Look, you need action, and you need some kind of skill level. It should be a game where you have to control things moving around on the scope like, oh, spaceships." "Spacewar!" we shouted.'

Some (what would prove to be typically slacker, coder-led) procrastination later, the game was born. Two player-controlled torpedo-laden spaceships could battle around a vector-sketched sun

that pulled ships towards it with its gravity field, against a background of a correctly plotted solar system in realtime using a control system based on the PDP-1's switches. The switches were cumbersome, to the point of being physically painful, and that led to gaming's first peripheral: push-button boxes were acquired from the university's model railroad club, and wired into the system. The first gamers could now play for hour upon hour, and they did. Eventually, as hardware costs fell, the first computer game became the first arcade machine. *Computer Space* was developed by Nolan Bushnell, who produced 1,500 cabinets in 1971, but the game was too complicated for an uninitiated audience, and was largely ignored by the public.

Bushnell found more success the following year with *Pong*, the bat and ball game that became videogaming's first icon. Programmed by Al Alcorn, *Pong* started as a working demo of the coder's abilities, but became a worldwide smash – so popular, in fact, that many attribute the success of gaming's first console, the Magnavox Odyssey, released that same year, to the way that *Pong*



Far left: A family enjoys electronic entertainment in the mid-80s thanks to the Magnavox.

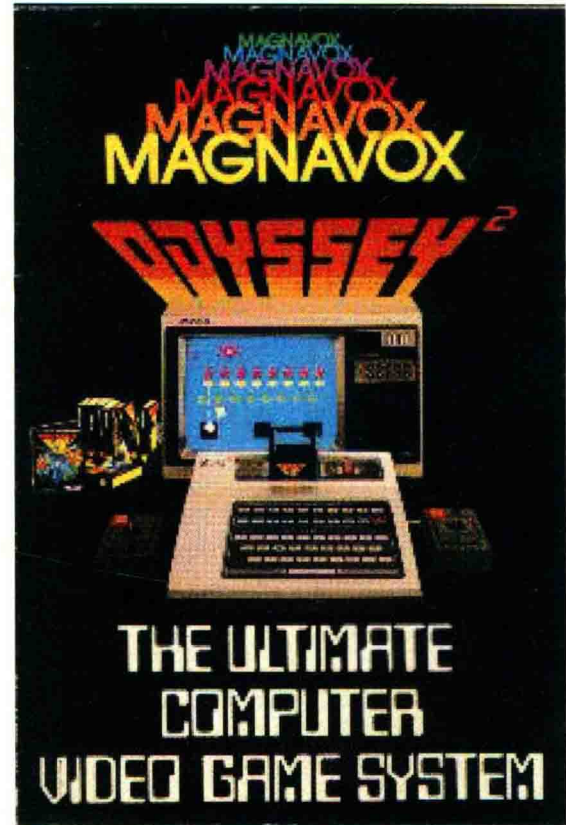
Left: A PDP-1, a far cry from the games machines of today.

Above: The Fairchild Channel F was rebranded the Grandstand in the UK.

Below: Odyssey: The ultimate videogame system... for a short time, at least.

had so effectively infiltrated public consciousness. Gaming as a mainstream pursuit was born, arcades boomed, and a host of home systems followed. Notably, 1976 saw the release of the Fairchild Channel F, the world's first cartridge-based game console, which led to the Atari VCS in 1977. But, while hardware was increasing in sophistication, the videogame development model remained broadly the same: one person, one idea, one game.

Which isn't to say that game design stood still. Innovation flourished in the arcades, and nowhere more effectively than with Taito's *Space Invaders*. A cultural phenomenon in its native Japan, it was imported by Midway in 1978, and contained one notable improvement on its predecessors: a high-score. Now games players had a target to aim for, and the industry reaped rewards out of competitiveness. In 1979, Atari's *Asteroids* took that principle one stage further. This best-selling arcade game owed its popularity to its high-score table. Successful players were rewarded with three initials alongside their hard-won score.



SEMINAL VIDEOGAMES FROM THE PERIOD

Below: **SPACEWAR!**
MIT (1962)

The father of all videogames, *Spacewar!* laid the ground rules for game design: make something that's technically impressive, always different, and always fun. Despite this, its transition to the arcade was unsuccessful. Would-be players found the controls too complex, and waited for something simpler.

Bottom: **PONG**
Atari (1976)

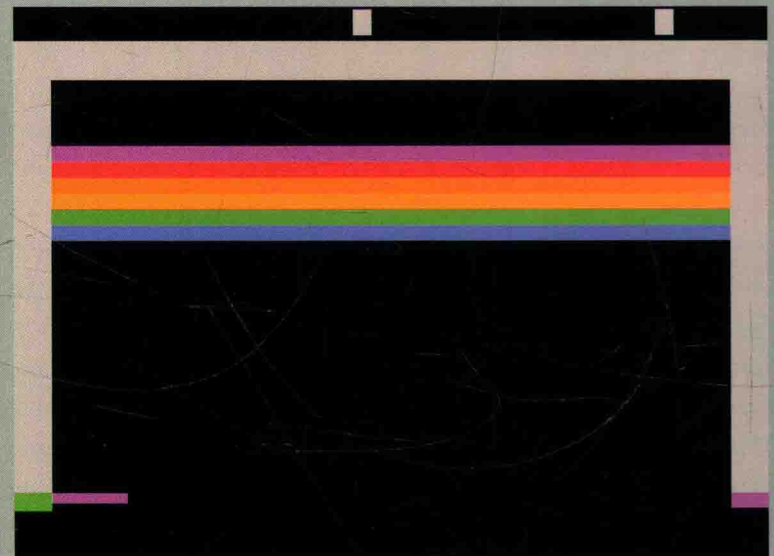
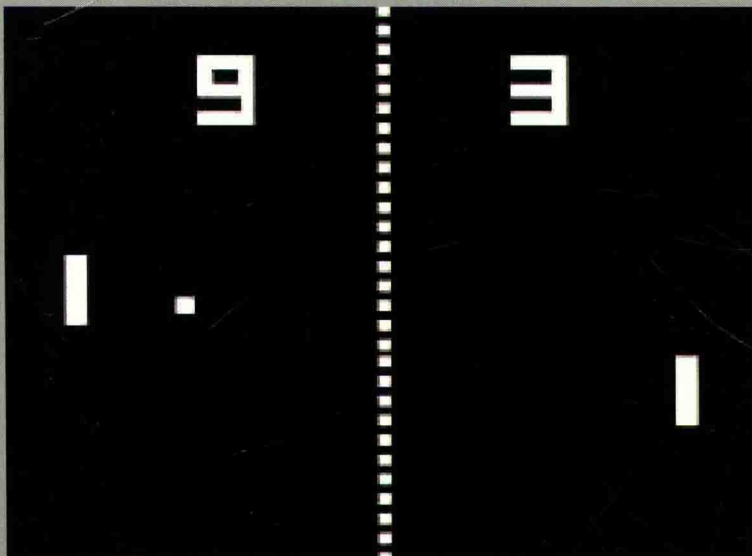
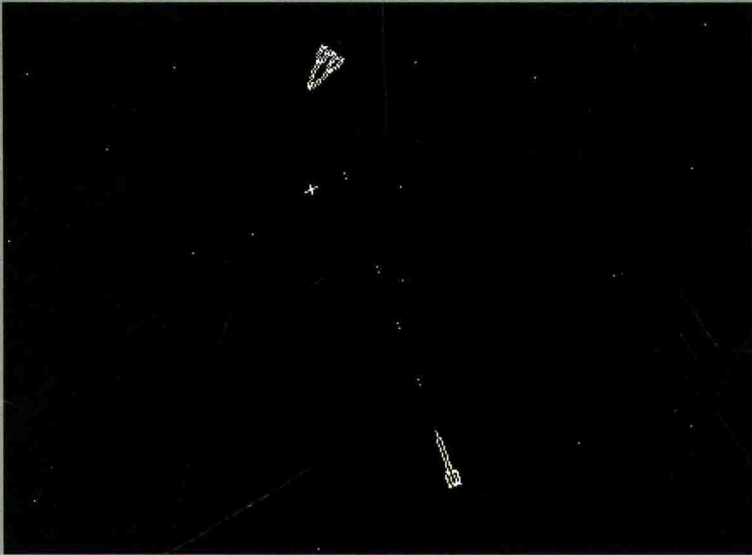
Pong was that simpler game. Players grasped the bat-and-ball concept with enthusiasm, partly due to the one-line mission statement: 'Avoid Missing Ball For High Score.' The design survives today in the form of tennis games, which cover the same elegant principle in layers of modern game design.

Below: **GUN FIGHT**
Midway (1975)

The first game released by Midway, the new videogame division of pinball manufacturer Bally, *Gun Fight* was the first arcade game to use a microprocessor. Again, it was a two-player competition. Gamers played cowboys on opposite sides of the screen, shooting each other and hiding behind cacti.

Bottom: **BREAKOUT**
Atari (1976)

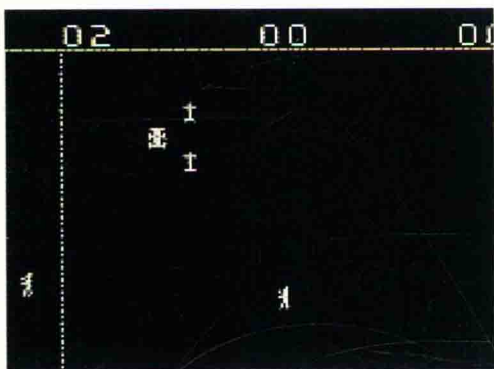
Included here not because its designer, Steve Jobs, went on to co-found Apple Computers, but because it was the first successful example of iterative game design. In *Breakout*, *Pong*'s bat-and-ball principle became bat-and-wall, the ball speeding up as bricks at the top of the screen were eliminated.



1. DEATH RACE

Exidy (1976)

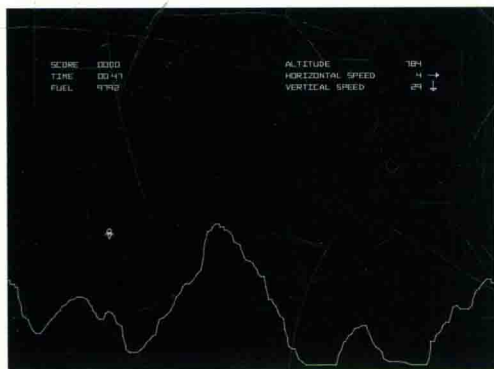
If you thought controversy over violent videogames was a new thing, think again. *Death Race* was banned in 1976 for its gruesome gameplay, which featured a tiny white car trying to run over tiny white goblins. Inspired by the movie *Death Race 2000*, it set the bar for several decades of weak, controversy-packed cash-ins.



4. ATARI FOOTBALL

Atari (1979)

Atari Football wasn't the first game to cash in on the enormous desire to recreate sports in a lazier fashion, but it was the first to use a trackball as a method of input. Xs and Os on the playfield defined the football players' locations, and players spun the trackball hard and fast to make them move around. The input method would return a quarter century later, for the worldwide success *Golden Tee*.



2. LUNAR LANDER

Atari (1979)

Though the principle behind *Lunar Lander* is hardly revolutionary – take a spaceship, and park it neatly on the planet surface before your fuel runs out – the technology was. This was Atari's first vector graphics game, a feature which allowed the game to 'zoom in' as the player approached the planet surface, and brought a different kind of style to videogaming.

COMPUTER OTHELLO

Nintendo (1978)

[No images exist]

Notable because it represents Nintendo's entry into the arcade market, *Othello*'s graphics may have been simple – the black and white pieces were portrayed on the monochrome screen by plus and square symbols – but its appeal was broad. *Othello* was built into a cocktail cabinet, allowing players to sit down while they played.

3. ASTEROIDS

Atari (1979)

Asteroids' main input into gaming's creative pantheon was the high-score table that finally gave players show-off rights. Other elements stick just as long in the memory, though, like developing strategies to 'fish' for the high-scoring UFOs, or the intimidating two-tone music that upped the game's tension as the playfield was cleared.

5. SPACE INVADERS

Taito (1978)

In this case, videogaming's lore is true: *Space Invaders* really did create a shortage of coins when it was released in Japan. It has proved to be a huge influence culturally, but also in design terms, creating the high-score system which was to draw players back to various strands of arcade gaming for many, many years.

