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## Tempest

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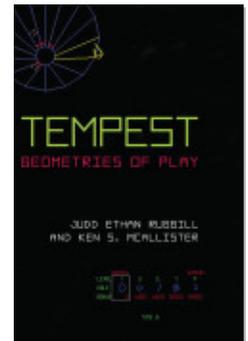
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## CHAPTER 3

# Contexts

In this chapter, we explore *Tempest's* contexts, describing the larger environment from which the game's distinctive look and feel materialized. We begin by surveying the prominent global and national events of the late 1970s and early 1980s, the years immediately surrounding *Tempest's* development and release. Our logic for this jumping off point is straightforward: as with any human creation, even when specific large-scale events appear absent from a given game, their traces are often detectable in its aesthetics, play mechanics, and objectives. Apprehending *Tempest's* background, therefore, not only helps situate the game as a landmark temporally but also politically, ideologically, and geo-historically.

From these global and national spheres we move to a description of *Tempest's* cultural and marketplace contexts. Our focus in this section is on how designer Dave Theurer and developer Atari adapted the popular culture zeitgeist to produce an experience that was linked just enough to the time period to seem familiar but was also replete with a futurism designed to appeal to the young people who were flooding into arcades in industrialized countries around the world.

We conclude our investigation of *Tempest's* contexts by touching on the play experiences that proximally surrounded the game. Whereas the marketplace context includes the competition for consumers' coins, and the generic context (which we discussed in chapter 2) offers a stylistic genealogy, the interactive context encapsulates how it likely felt to see and play *Tempest* in the midst of the other machines in the arcade.

Importantly, and in contrast and complement to the microscopy, textual fidelity, and artifactual focus of chapters 1 and 2, we work quite broadly in

this chapter, teasing out *Tempest's* intertexts in ways designed to situate and also transcend the game's specific technologies, narrativities, and cultures. We range across both time and space, charting an array of socio-cultural rivulets that converge in *Tempest's* contextual and semiotic stream. We do not attempt to depict this stream precisely or even empirically; that task would be far beyond the scope and *raison d'être* of this book. Rather, we merely mean to articulate some of the notable extra-textual but interconnected energies of *Tempest's* day, energies upon which the game drew, to which it contributed, and that help inform its landmark status.<sup>1</sup>

Similarly, we are not claiming here that Theurer was responding directly to the multitude of world events we point out below when he designed *Tempest*. Rather, our aim is to remind readers that the game was created in an incredibly complex socio-political milieu, a context that made its mark in one way or another on everyone and everything within it—including Theurer and his games.<sup>2</sup> In other words, we do not focus on the game so much as on its surroundings. Because these surroundings were so diverse, we approach them linearly and via a repeated pattern: in each section, we begin two years before (1979) and conclude two years (1983) after the game's release. Our goal with this temporal range is to reasonably condense yet fairly represent the complexity of *Tempest's* global and local contexts.

### Global Context

*Tempest* was aptly named, for it was produced and played during a tempestuous era. In 1979, just two years prior to the game's release, the Vietnamese government unseated Cambodian dictator Pol Pot and the Khmer Rouge National Army, events that triggered China's invasion of northern Vietnam and the start of the Sino-Vietnamese War. At the same time, the Middle East was erupting in response to the rise of Ayatollah Khomeini and his Council of Islamic Revolution. Embroiled in this political miasma were Iran, Afghanistan, Chad, Iraq, Russia, the United States, Israel, and Libya, among others. Other notable geopolitical headlines from 1979 include a vote for home rule in Scotland (repelling, at least on paper, the invading English), a coup in Grenada (repelling an authoritarian government), continued violence between protestants and Roman Catholics in England and Ireland, and the Iran Hostage Crisis. In the year leading up to *Tempest's* design, in other words, any reasonably informed American likely would have been attuned to and concerned with the Earth's geopolitical

instability.<sup>3</sup> Concomitantly, it is easy to imagine a psycho-political dynamic influencing the explosive growth in video game arcade culture, and why the home console market had become the next frontier for consumer electronics companies to conquer: people were increasingly looking to escape the escalating woes of the world.

The year 1980 began with US president Jimmy Carter establishing a grain embargo against the Soviet Union in response to the USSR's 1979 invasion of Afghanistan, initiating what some historians call "the second Cold War" (Halliday 1983, 2). Over the next twelve months, tensions and tragedies emanating from this transnational dispute perfused across the globe. Russian nuclear physicist and Nobel Peace Prize winner Andrei Sakharov was arrested in Moscow for his outspoken views against nuclear proliferation, more than four dozen people were killed during a rocket fueling accident at Russia's Plesetsk Cosmodrome, and Polish labor and human rights activist Lech Wałęsa initiated the first of many national strikes that culminated—after much bitter struggle—in the creation of Solidarity, which became one of Poland's largest and most powerful independent trade unions.

Also in 1980, Salvadoran Archbishop Óscar Romero was assassinated by government agents for preaching against the state's repression of its people during the Salvadoran Civil War. One week later, the violence escalated, and at Romero's funeral dozens of people were killed by government-backed sharpshooters. One of these same "death squads," as they became known, soon made headlines again when its members raped and killed three Roman Catholic nuns and lay missionary Jean Donovan, sparking international outrage and an investigation of the Salvadoran government's actions and suspected connection—confirmed several years later—to the US government.

Closer to the United States, Cuba welcomed the leftist guerrillas who had held dozens of people hostage for two months at the Dominican Embassy, even as it allowed upward of 125,000 Cubans—including, it was later discovered, numerous prisoners and people suffering from mental illness—to emigrate to the United States during the Mariel Boatlift. The other major stories in 1980—apart from the Summer Olympics in Moscow that the United States and other countries boycotted—were the start of the Iran-Iraq War (the longest conventional war of the 20th century) and a powerful earthquake in Italy, which killed thousands and left many more homeless. These were the events that gobbled up newspaper columns and the evening news, informing Americans not simply about the state of

affairs elsewhere in the world but also about how information flowed in increasingly rapid and seemingly borderless ways. As Paul Virilio puts it: “With live transmission, local time no longer creates history. Worldwide time does” (Dufrense n.d., para. 18).

The year 1981 was even more intense in many respects. Deadly earthquakes struck China and Greece; there was an attempted military coup of the Spanish government; and Bangladeshi president Ziaur Rahman, Iranian prime minister Mohammad-Javad Bahonar, Iranian president Mohammad-Ali Raja’i, and Egyptian president Anwar Sadat were all assassinated. An assassination attempt was made on Pope John Paul II, South African troops invaded Angola, Israel bombed Beirut and Iraq, and Cuba was struck by a dengue fever epidemic that some suspected was an act of biological warfare perpetrated by the United States. In South London, the race-related Brixton Uprising resulted in hundreds of injuries, and in Chile, Augusto Pinochet, the US-backed dictator who had several thousand insurgents killed during his time in office, was “given” another eight years as leader despite a majority vote against his presidency. The Salvadoran Civil War was punctuated by the El Mozote Massacre in which government troops killed nearly a thousand civilians, and martial law was declared in Poland in order to prevent the Solidarity union from further undermining the Communist regime.

Meanwhile, talks between the United States and the Soviet Union concerning nuclear weapons reductions continued to falter, even as nuclear-related accidents—such as the running aground of a Soviet nuclear-armed submarine in Sweden; the accidental explosion of a Pershing II missile at a US military base in Heilbronn, Germany; and multiple nearly catastrophic NORAD false alarms signaling massive Soviet nuclear attacks on the United States—were on the rise. As globalized information outlets found their footing, one message in particular began to permeate popular culture: human beings are always at war or tottering near its brink. This explains, in part at least, why humans have long played at war, and how the experience of escalating conflict—so heavily and trans-culturally depicted in the televisual age—can be so easily transmuted into entertainment: ironically, war—real and simulated—brings humans together to test their mettle, defend their principles, and strive for the rewards of victory.

By 1982, the year after *Tempest’s* release, small-scale conventional wars the world over were all but ubiquitous, and the superpowers were nearly always involved directly or indirectly: the Falklands War, the First Lebanon War, the Ugandan Civil War, and the Lebanese Civil War, not to mention

the continuing wars and armed skirmishes in Thailand, Burma, Vietnam, Cambodia, Sri Lanka, Laos, the Philippines, Chad, Uganda, and elsewhere. Even as some economies faced collapse (e.g., Mexico, Yugoslavia, Chile), globalization and world trade were intensifying and becoming more tentacular. This latter point is perhaps best exemplified by the General Agreement on Tariffs and Trade (GATT) Ministerial Meeting in Geneva, Switzerland, in November, which laid the groundwork for, among other multilateral trade agreements, resolutions on the transnational protection of intellectual property—including the integrated circuits and software involved in video game production and play.

The period of 1979 to 1982, in other words, was a period of global tumult and confrontation, a period defined precisely by the sorts of clashes and drive to conflict that are central to *Tempest*. In documenting the hyper-mediated global events of the period just prior to, during, and just after *Tempest*'s release, however, we do not mean to imply an unambiguous correlation between the contents of the news and the practice of game design, distribution, and consumption as they were drawn out in *Tempest*. Rather, we simply mean to point to the global moment within which *Tempest* was designed and played and to suggest that certain of the game's defining qualities—fending off both sneaking and marching invaders with increasingly sophisticated and deadly weapons, for example—are hardly surprising given the day's headlines.

Of course, the era's global news and entertainment media had a potent local component as well, a poultice that offered some comforting domesticity to the psychic injuries sustained in the emergent global media barrage. These homegrown issues, though at times as ominous and destructive as those unfolding elsewhere in the world, also connect to *Tempest*'s appearance and appeal, and it is to this national context that we now turn.

### National Context

Leading up to *Tempest*'s release, US citizens were besieged with signs of the country's geopolitical and technological superiority, as well as with threats to this superiority. In early 1979, for example, the *Voyager 1* space probe began sending back spectacular photographs of Jupiter and its moons. At the same time, NASA was preparing for the launch of *Columbia*, the world's first multiple use orbital vehicle and a machine that simultaneously vivified America's flagging space-oriented imagination and fueled anxieties about the Cold War going galactic. Exacerbating these concerns was the

announcement that Skylab, an orbital space station that had been in service since 1973, would soon re-enter Earth's atmosphere and crash to the ground—hopefully not in a major metropolitan area.

Other signs of technological advancement—and the negative consequences such advancement often trows—were also in the news. Even as two major cable networks took shape (Nickelodeon and ESPN) and Paul MacCready and Bryan Allen built and flew a human-powered aircraft across the English Channel, the Chicago, Rock Island, and Pacific Railroad declared bankruptcy, and anti-technology crusader Ted Kazinski—the so-called Unibomber—sent out the first of his many mail bombs. On the computer programming front, the Ada language was released as the de facto coding schema for US government projects, especially those written for the defense industry (e.g., missile guidance systems) and public safety initiatives (e.g., air and rail traffic control, satellite systems, and so forth). This standard, however, was highly controversial and sparked protests by many engineers and scientists who believed its unreliability made it dangerous for safety-critical applications.<sup>4</sup> The language never took hold for more mundane commercial applications such as video games—it was widely viewed as too complex for commercial use—even though early releases of the development environment included sample code for making a *Tetris*-like game.

As the curtain closed on Jimmy Carter's presidency and opened on Ronald Reagan's, one of the prominent sources of inspiration for the national public was the steady stream of astonishing photographs being sent back from *Voyager 1*. In February of 1980, the space probe took the first high-quality images of Janus, one of Saturn's moons, and in November *Voyager* came within 77,000 miles of the planet's cloud layer. Through pictures reprinted in newspapers across the country, Americans were treated to close-up images of Saturn's famous rings, as well as high-resolution color images of the planet/rings pairing that only weeks before had been the stuff of science fiction.

Other 1980 headlines were grimmer and contributed not to a positive popular impression about space or technology but to the growing cultural anxieties about high-tech war. For example, the Chrysler Corporation—the nation's tenth-largest manufacturing company, a major contributor to the military-industrial complex (e.g., tanks, rockets), and a cornerstone of the automotive industry—came so near to collapse that it required a federal bailout to save the company and preserve thousands of jobs. It was also in 1980 that the draft was reinstated for eighteen- to twenty-five-year-

old males in preparation for potential hostilities with the Soviet Union. Though *Tempest* designer Dave Theurer likely would have narrowly missed being eligible for this peacetime draft due to his age, it is easy to understand why he might have been troubled by images of bombs falling on cities—as in his 1980 game *Missile Command*—but also captivated by notions of outer space.

That the Iran Hostage Crisis was ongoing throughout 1980 only further frayed Americans' nerves, even as a host of natural and environmental disasters instilled fears about everything from vacationing (the MGM Grand Hotel and Casino fire in Las Vegas, Nevada, killed eighty-five people) to the unpredictability of Mother Nature (Mount St. Helens erupted) to the widespread problem of toxic waste in people's backyards (the federal government implemented the Comprehensive Environmental Response, Compensation, and Liability Act, which aimed to reveal and clean up so-called superfund sites). In short, 1980 was a year marked by news of constant attack and insecurity from all quarters: military, environmental, industrial, biological, and technological. This was the zeitgeist within which *Tempest*—a game about fending off varied and constant enemy attacks that can, in effect, shoot, capture, electrocute, and otherwise destroy the player's avatar—was imagined. Thus, while the game's imagery was abstract, the threats it posed to players were almost literally ripped from the headlines.

The years of and immediately following *Tempest's* release were similarly dynamic. On the one hand, the Iran Hostage Crisis came to an end just minutes after Ronald Reagan was sworn into office; the Space Shuttle *Columbia* successfully flew its first mission; the long-awaited design for the Vietnam Veterans Memorial was selected; the first US test-tube baby was born; and Sandra Day O'Connor became the first woman to serve on the US Supreme court—all developments that were generally received by the public as signs of national healing and progress. On the other hand, President Reagan was shot by John Hinckley Jr.; several people were killed during a test of the Space Shuttle *Columbia's* rocket engines; the Centers for Disease Control and Prevention identified the first AIDS cases; and despite Justice O'Connor's presence, the Equal Rights Amendment failed to be ratified by Congress—further evidence that progress begets additional and more difficult challenges.

Notably, this socio-cultural pattern—in which advancement multiplies and amplifies conflict and problems—is fundamental to *Tempest*, and while it was not the first or only game of its era to deploy this mechanic, it certainly reified it via the Skill-Step feature. By presenting players with

an unambiguous set of choices indexed to game levels meant to accustom the play experience to the user's ability, Skill-Step transformed the idea of problem multiplication and amplification from an unarticulated, uncontrollable, yet expected property of the game into a mechanism of self-actualization within (and arguably even beyond) the diegesis.<sup>5</sup> In other words, Skill-Step extended the idea of problem multiplication and amplification into a doctrine of war preparation, which once committed to, contributed a significant element to how *Tempest* felt to play—one that for all but the best players lasted well past the end of the game in the form of personal reflection: “Would I have made it farther if I had started at an easier level, or should I have started at a harder level to get more practice in advance of the greater challenges yet to come?”

At any rate, the extremes of 1981 continued through 1982. That year, three quarters of a million people gathered in Central Park in New York City for the largest rally against nuclear proliferation in history; the Knoxville World's Fair hosted over eleven million visitors and distributed specially minted game tokens for visitors emblazoned with the likenesses of *Pac-Man* (1980), *Ms. Pac-Man* (1981), *Qix* (1981), *Gorf* (1981), *Space Invaders* (1978), *Scramble* (1981), and *Donkey Kong* (1981); and “Lawn Chair Larry” floated more than three miles into the sky with nothing more than helium balloons tied to a lightweight piece of patio furniture. At the same time, the Unabomber struck again and was also briefly considered a suspect in the Chicago Tylenol murders, lethal injection became the de facto method for killing inmates on death row, and a retired dentist became the first person in history to receive an artificial heart. Perhaps the most important domestic headline of 1982—for the future of computing if not for the video game industry directly—was the breakup of “Ma Bell.” AT&T was disaggregated in response to antitrust proceedings, opening up possibilities for competition in the long-distance marketplace that eventually led to the development and massification of satellite phone and data transmissions.

In a way, the national context for *Tempest* was a microcosm of the game's global context: dynamic, unnerving, and dislocative. One could certainly argue, in fact, this global-local relationship to be self-evident. History and cultural development are fractal—events scale up or down in endless and nearly identical patterns, always influencing and being influenced by other things. This would explain why so many of the national and international events of the time seem to resonate in the look, sound, and feel of *Tempest*, and why elements of *Tempest* are discernible far beyond the arcade (as will become clear below).

Such a systems approach to unpacking *Tempest's* meaning is beyond the purpose of this book in a comprehensive way. Moreover, after a point, it also does not particularly nor effectively help illuminate *Tempest's* status as a landmark video game. Thus instead, we suggest here that the repetition of patterns from global to local is a result of the fact that the United States—the country in which Dave Theurer lived and *Tempest* was born—was a superpower at the time and consequently held the extraordinary capacity to shape the global theater according to local phenomena and ideology. Were this book about *Tetris* (1987)—a game developed by a Soviet computer engineer just a few years after *Tempest*—we would perhaps be making a similar argument about that game's context but from a Russian perspective. Regardless, there is no question that even Americans who were relatively ignorant of global politics would still have been steeped in the paranoia, fear, and antagonistic imaginings that transformed the popular culture of the time. Thus, when Theurer says that *Tempest's* origins lie in a dream he had about monsters climbing out of a hole, it is no great interpretive stretch to say that the game's invaders might represent aliens from outer space (which was newly visible thanks to *Voyager 1* and *Columbia*), Communists (or other enemies, of which the United States seemed to have many), viruses (such as the recently discovered HIV), or technological projects gone wrong (nuclear threats and accidents were proliferating). From a global and national perspective, all of these are quite reasonable interpretations, and we would go so far as to say that they are each true in their way. *Tempest* was conceived, developed, and released in a specific and special environmental salmagundi whose ingredients palpably suffuse the game world.

As we suggested above, we are not discounting the possibility that Theurer did, in fact, dream up (literally) the idea of *Tempest*. Rather, we mean to clarify some of the very real material that might have contributed to the substance of such a dream. Theurer himself has spoken about how his professional goals and responsibilities became entangled with his (understandable) anxiety about nuclear Armageddon in the 1970s and 1980s:

When I did *Missile Command* I lived near Ames Research Center down in Mountain View. They were always sending out these U2 flights, they go straight up and sound like an atomic bomb exploding. I'd hear those things and it would terrify me. And I'd wake up in the middle of the night from a nightmare where I'd see these streaks coming in, and I'd be up in the Santa Cruz mountains and I'd see it

hit Sunnyvale and I'd know I had about 45 seconds until the blast reached me. I had those nightmares once a month for a year after I finished *Missile Command*, I had internalized the game so much while working on it. Having to do all this other stuff raised hell with my personal life, too. If there's anything I could communicate in this interview it is that people should watch out for their personal lives when they get sucked into these projects. It's really seductive and all consuming. My entire existence was creating these games. They're holding out this huge carrot, all the money you're going to make. And it's fun, so you think, OK, if I can just make it for two or three years, then I'll work on my life. I see a lot of that going on now. (Morph 1994, n.p.)

It is also worth noting that Theurer did not merely have voyeuristic familiarity with nuclear hardware. His first job out of college was working as a programmer for Bunker Ramo, a military electronics company. Simon "Si" Ramo, one of the founders of that company, was a major contributor to the development of the Intercontinental Ballistic Missile (ICBM), which became the cornerstone of the nuclear arms race.

There are, of course, other contextual elements worth noting, elements that in some ways speak more immediately and tangibly to how *Tempest* worked and why the public received it so enthusiastically. Specifically, we are thinking of developments in US popular culture, the consumer electronics marketplace, and arcades and home games. The first of these semi-otic domains—US popular culture—is the subject of the next section.

### Cultural Context

In 1979, the industrialized world (and the United States especially) was awash in technological developments that both revolutionized communication and seemed to bring the future into the present. Usenet newsgroups, for example, almost instantaneously changed how people with access to the Internet exchanged information. Built on a technology that is arguably the precursor to everything from Web fora and FAQs to blogs, RSS, and Atom aggregators, Usenet newsgroups provided the infrastructure for some of the first online communities. During this same time, Dan Bricklin and Bob Frankston wrote and released VisiCalc, generally considered to be the first spreadsheet application for the microcomputer, the first "killer app," and the software program that put Apple Computer, Inc. (and arguably home

computers generally) on the consumer electronics map. As middle-class buyers began to think seriously that having computers in their homes made sense for both practical (ostensibly) and entertaining (actually) purposes, they were simultaneously exposed to the idea that, through the introduction of the Sony Walkman, their personal music collection could be made mobile. Even as the Walkman and its plethora of portable audio-cassette-playing clones became ubiquitous, Philips and Sony together were testing and standardizing the Compact Disc format that would shortly replace the audio cassette. Notably, as magnetic tape was being phased out for audio purposes, its utility was about to extend many times over in the home movie industry: JVC's VHS format had triumphed over Sony's Betamax, prompting a number of Hollywood studios—including Paramount and Columbia—to reorganize in order to compete in the growing home entertainment (i.e., movies on videotape) market.

Complementing these technologies in orienting consumers to the narrowing gap between future and present, digital and analog, work and play, liminal and liminoid, were a host of television series that offered an unprecedented set of opportunities for viewers to imagine themselves (or at least their descendants) as galactic travelers: *Doctor Who* (1963–89; 2005–2015), *Blake's 7* (1978–1981), *The New Adventures of Flash Gordon* (1979–1982), *Buck Rogers in the 25th Century* (1979–1981), *Mork & Mindy* (1978–1982), and *Battlestar Galactica* (1978–1979), among others. The same thing was happening on the big screen where theatergoers were being treated to major releases featuring the kinds of themes players would soon find in *Tempest* and other arcade games: space battles (*Star Trek: The Motion Picture*), alien invasion (*Alien*; *Phantasm*), a near-future apocalypse (*Mad Max*; *Meteor*; *The China Syndrome*; *Prophecy*), time travel (*The Black Hole*; *Time After Time*), and the Cold War (*Moonraker*; *Apocalypse Now*). In fact, by the end of 1980, many of the futuristic concepts of the late 1970s had become reality.

Technological innovations and the convergences they encouraged extended well beyond the mass media. GPS technology, for instance, which had proven indispensable for military applications, would soon be made available to the public, changing how people thought about navigation in everything from life-critical (e.g., commercial airline flights) to life-enhancing (e.g., returning to a favorite fishing spot) undertakings. Similarly, new techniques had been developed for data transmission over Ethernet, allowing for (at the time) extremely high-speed transmissions (10 Mbs or about 1.2 MB/second). At the same time, Bill Gates's new company

Micro-soft—this was the original spelling—was hired by IBM to write an operating system for its soon-to-be-released personal computer; Raymond Damadian released the first commercial full body MRI scanner; and the lithium-ion battery—today a mainstay of the modern consumer electronics industry—was made practical. More than ever, people in industrialized nations were experiencing the ways in which computers could do more than just compute; they could save lives, expand the horizons of the species, and, of course, entertain.

The possibilities of computers and other new technologies could also frighten. Throughout 1980, the Unabomber's anti-technology attacks continued unabated and filmmakers seemed obsessed with stories of advanced alien invaders (*Gamera: Super Monster*; *Flash Gordon*; *Superman II*), repressive technological societies (*Star Wars Episode V: The Empire Strikes Back*; *Battle Beyond the Stars*), new and old technologies in conflict (*The Final Countdown*; *Galaxina*; *Altered States*; *Saturn 3*), and the absurd, sometimes tragic effects that technologically entwined life begets (*Hangar 18*; *The Ninth Configuration*; *The Shining*; *Cheech & Chong's Next Movie*; *Caddyshack*).<sup>6</sup> These same themes pervaded television as well, echoing in ongoing programming and new fare alike, ranging from the sublime (*Cosmos: A Personal Voyage*) to the ridiculous (*Beyond Westworld*; *Galactica 1980*).

Particularly noteworthy in 1981 was IBM's announcement of the IBM PC. The machine was relatively unremarkable from aesthetic, performance, and price-point perspectives: it looked like a bland office machine, used a tried-and-true processor (i.e., slow even by 1981 standards) and an inefficient operating system (*Micro-soft DOS 1.0*), and cost around \$1,600 (a sizeable amount then). By comparison, the Commodore VIC-20 was much cheaper (\$300), the Apple II better looking, the Osborne 1 more portable, and the TI-99/4A produced better graphics. What the IBM PC had, however, was an open architecture (i.e., anyone could develop hardware and software for it) and IBM's marketing muscle and brand recognition to foster rapid market penetration. By the time *Tempest* was hitting its stride in arcades, 1.4 million personal computers had become fixtures in homes and businesses, double the number of the year before (Reimer 2005).

Needless to say, the media industries both encouraged and benefited from this popularization of computation. In 1981, MTV, HBO, and Showtime joined CNN and Cinemax in offering twenty-four-hours-a-day programming, a development made possible in part by advances in both industrial and consumer-level computing and electronics (including satellite

deployment and video recording devices). Concomitantly, all manner of shows on television (e.g., *Hill Street Blues*, *The Fall Guy*, *Falcon Crest*) featured episodes that hinged on computer culture, from hacking, bank fraud, and disastrously buggy software, to love scenes, shoot-outs, and nerd duels in video game arcades.

Filmmakers, too, had discovered the power and appeal of computers, using them behind, if not necessarily on, the screen. *Raiders of the Lost Ark*, for instance, thrilled fans with its spectacular and computer-assisted special effects. While the effects themselves were optical and not digital in nature, computers were essential to their production. It was computers that precisely controlled the cameras that moved among the film's life-like miniature sets, providing exceptionally smooth shots that would have been impossible otherwise (Robertson 2008).

Computers were on the screen too—or at least appeared to be. *Escape from New York*, for example, contains images of a vector-based computer navigation panel. These images were not produced by computer, however, but with three dimensional models painted black and outlined with reflective tape. In a bit of moviemaking magic, the models were filmed under black light, causing the tape to light up in full color and produce the illusion of vector graphics (Squires 2011). Other films relied on similar tricks to mimic this kind of computational visualization, from *Outland*, which used several varieties of vector-like imagery to depict computer interfaces and space effects (including one that looks strikingly like *Tempest's* cylinder tube), to the disturbing poster art of British cult classic *Inseminoid*.

In fact, the vector graphics aesthetic—sharp lines, saturated colors, and often a sense of three-dimensionality—seems to represent for the late 1970s and early 1980s popular imagination the enormous stored up energy of computers and offered waypoints for highly industrialized society that lead from the urban dirt and grime of the present to the pristine flux and fluidity of the future. The malevolent sorcerer (appropriately named “Evil”) from *Time Bandits* sums up this vision well (if tongue-in-cheek) when he muses on the motives behind his latest plan to his lackey, Robert:

EVIL: When I have the map, I will be free, and the world will be different, because I have understanding.

ROBERT: Uh, understanding of what, Master?

EVIL: Digital watches. And soon I shall have understanding of video cassette recorders and car telephones. And when I have understanding

of them, I shall have understanding of computers. And when I have understanding of computers, I shall be the Supreme Being!

In 1982, a year after *Tempest's* release, the planets aligned in ways that confirmed the game's high-tech iconic arcade experience<sup>7</sup>: compact discs became available to the general public; Disney's futuristic EPCOT Center opened; emoticons and computer viri entered the mainstream; Dolby Surround Sound was offered in home audio components; British commercial network Television South broadcast the first television program depicting three-dimensional computer graphics; and *Time* magazine famously chose "The Computer" as its 1982 Man of the Year. In addition, *T.J. Hooker* (starring *Star Trek* legend William Shatner) and *The Powers of Matthew Star* (notable here for its opening and closing segments that used the same electric blue vectors that made *Tempest* so distinctive) debuted, even as mass media executives began to actively pursue closing the format gap between video games and television (e.g., *Knight Rider* was made into a themed game and *Pac-Man* prompted a Saturday morning cartoon). By 1983, CBS had an entire television stable of video game characters grouped together under the title *Saturday Supercade*, and by 1984, ABC was airing a cartoon based on *Dragon's Lair*.

Games were being developed from other properties too. *E.T.: The Extra-Terrestrial*, *Star Trek II: The Wrath of Khan*, *Poltergeist*, *Firefox*, *First Blood*, *The Dark Crystal*, *Conan the Barbarian*, *Blade Runner*, *Megaforce*, *Porky's*, *On the Trail of the Pink Panther*, *Rocky III*, and *Tron* were all 1982 films that were soon followed by video game treatments. Interestingly, while much has been written about the US video game crash of 1983–84, comparatively little scholarship has documented the role of television and film in that phenomenon. Instead, pundits observe (quite rightly) that the crash was primarily due to poor quality control, low barriers to entry, and few video game powerhouses dominating the marketplace. Clearly, though, consumers in the late 1970s and early 1980s were being overwhelmed with the video game concept from all over the media landscape. Not only was there a glut of video games by 1983, there was also a glut of media experiences constellating around video games generally.

There are few examples of how the proliferation and penetration of computationally driven mass media was evolving that are more salient and disturbing than David Cronenberg's 1983 film *Videodrome*. Starring James Woods as Max Ren, an ambitious executive at a small television station,

the movie depicts Ren's descent into a suicidal madness catalyzed by a covert, brain-tumor inducing signal embedded in a pirated television broadcast of scenes of anonymous tortures and murders. While the movie's tag line—"First it controls your mind, then it destroys your body"—appears to refer to the medium of television, an attentive viewing suggests that Cronenberg was commenting on the whole of the early 1980s mass media apparatus—from the new 24/7/365 broadcast cycle, to the amorality of media executives, to the increasingly immersive voyeurism that newer television programming was enabling, to the full-scale integration of computers into mass media. Significantly, Cronenberg placed an Atari 800 computer system, Atari 810 floppy disk drive, two Atari 2600 joysticks, and two Atari games (*Combat* [1977] and *Air-Sea Battle* [1977]) in two decisive scenes in the film, as if to emphasize that the eros generated by the nexus of television, violence, computation, play, and the human psyche promised only the most ruinous of ends. As science-fiction scholars Sherryl Vint and Mark Bould put it:

The image of the visceral, fleshy videotape [in *Videodrome*] reveals how we are programmed by the signals we consume, and also emphasises [sic] the continuity of this realm of representation with the material, fleshy world. [. . .] The real battles are not fought on television screens, in abstract codes of information that exist in a separate space from the biological existence of human life. Rather, the representation and the material are relentlessly intertwined: technological artefacts [sic] fuse with and transform into flesh (Vint and Bould 2006, 238).

*Videodrome*, in other words, both enacted and depicted how synergies among real life, mass media, and entertainment could impact the human spirit in devastatingly deleterious ways.

Verisimilitude was not the only aesthetic being used at this time to convey the significance of the convergence of mass media and entertainment, however. Vector graphics, too—despite being relatively new and expensive (when actually rendered by computer, at least)—were becoming increasingly commonplace and had already been put before the public eye on television (e.g., *Buck Rogers in the 25th Century* [1979]; *Sapphire & Steel* [1979]) and film (*Star Wars* [1977]; *Alien* [1979]; *The Black Hole* [1979]) prior to *Tempest's* development. Therefore, while we cannot dispute Theurer's attribution of *Tempest's* origins to a dream, we would add that the chances of his

dream imagery having been influenced by the proliferation of *Tempest*-like imagery and content (not to mention the computers used to make them) in popular culture up to that point are high. We suggest, too, that other extant game machines of that time influentially flowed into and out from the *Tempest* of Theurer's imagination; this specific marketplace context is the subject of the next section.

### Marketplace Context

The late 1970s and early 1980s were, for all intents and purposes, the golden age of the video game arcade. Within Atari's stable alone, dozens of classic titles flank *Tempest*: *Asteroids* (1979), *Monte Carlo* (1980), *Battlezone* (1980), *Centipede* (1981), *Dig Dug* (1982), and *Crystal Castles* (1983), to name just a few. Atari's primary competitor in the vector game market at the time was Cinematronics, and in a distant third place was the short-lived breakaway company Vectorbeam, started by Larry Rosenthal (developer of Cinematronics' *SpaceWar!*-inspired game *Space Wars* [1977]) and Bill Cravens. Over the course of five years (1978–1983), Cinematronics and Vectorbeam produced a number of notable vector-based games, including *Rip Off* (1980), *Armor Attack* (1980), *Star Castle* (1980), and *Cosmic Chasm* (1983). In the home market, the GCE/Milton Bradley Vectrex console—an exclusively vector graphics-based game system—weakly competed with Atari's 5200 system, both of which were released in 1982.

While the reasons behind the early popularity of vector-based games are manifold and interwoven, several technical and marketplace details are important to highlight. First and foremost, the wireframe format of vector games in this era could be rendered on screen much more rapidly than raster graphics, a fact that permitted the design of games with more fluidly animated interactive elements. Vector graphics also facilitated the construction of rudimentary but navigable three-dimensional environments, which gave consumers a taste of virtual world immersion. By the time *Tempest* was released, this latter fact had already garnered the attention of studio executives at Disney. The company had tested the vector graphics waters in 1979 with *The Black Hole* and was on track to release *Tron* (a vector-rich 1982 film that arguably cemented vector aesthetics into mass consciousness). Interestingly, *Tron*'s creators—Steven Lisberger and Donald Kushner—were turned down by Warner Bros., MGM, and Columbia Pictures before Disney picked up the project (Culhane 1982, 3). That Warner passed on the film is perhaps understandable—it was already connected to the vector

world through its 1976 purchase of Atari. Also unsurprising is MGM's refusal to option *Tron*; the studio had fallen on hard times in the early 1970s, and by 1980 had dialed back its film production activities. Columbia Pictures' coffers were similarly diminished, not so much due to years of mismanagement (the MGM story) but rather because of a series of expensive but ultimately lucrative takeovers it had affected. Thus, even though all of these companies might ideally have wished to adopt an innovative vector graphics project like *Tron*, it was Disney that backed the venture.

It is worth dwelling for a moment on Warner Communications' connection to the vector marketplace, or rather the company's role in the media sphere of which that market was a part. The Atari acquisition enabled Warner to convert the public's growing interest in electronics and space exploration into a range of media-related consumer products to which the company already held the rights. Warner Communications, through its many subsidiaries, not only owned game software, hardware, and related patents but also some of the planet's most valuable media properties at the time. Among these properties were *Star Trek* (1966), *Mission: Impossible* (1966), and *Tarzan* (1966), all of which eventually found their way (in one form or another) into Atari's video game lineup. Warner also drew on the assets of a number of its other media content and production companies (e.g., Panavision, Elektra Records, MTV) to generate industrial and promotional leverage against its rivals.

Another important ingredient of Warner's strategy to claim its share of the growing consumer electronics market was its late 1970s development (through Warner Cable) of QUBE, the first interactive cable network and home of the Pinwheel Channel (later renamed Nickelodeon). By amassing and concentrating technologies and content providers for the purpose of capturing and acclimating consumers to the co-mingling of play, computers, and television, Warner helped redefine how everyday people approached—physically and psychologically—relatively sophisticated electronic devices. At the heart of this transformation were subsidiaries such as Atari and games such as *Tempest*, which delivered to local venues the thrill of far-off and future-found space heroes and adventures.

Returning to our discussion of *Tempest's* general marketplace context, it is instructive to look at the products that competed directly with coin-operated video games at the time. Just as the arcade industry was expanding in the late 1970s and early 1980s, so too was the home computer game industry (PCs, consoles, and handhelds). While arcade culture was already well established, with roots in the pinball and coin-operated game culture

of the 1930s (and the arcade and amusements culture before that), home video game culture was brand new. As a result, home video games had the powerful if short-lived market advantage of novelty and convenience: players could have the same kind of fun at home. Home play could also be easily supervised by parents, mitigating the manifold dangers of the local arcade (e.g., drugs, underage sexual encounters, and so forth). On the downside, home video games were often a misery to play, with poorly designed controllers, terrible graphics and sound, and even worse control schemes. They were also quite expensive to get into, both in terms of hardware and software.

Arcade machines, by contrast, offered much higher audiovisual quality, more complexity in their play offerings, and were cheaper to play (over the short term). However, arcades were often located in seedy neighborhoods and business establishments, and sustained play could wind up being surprisingly costly. It was this general dynamic—novelty, cost, quality, safety, location, and fun—that formed yet another important part of *Tempest's* context and suggests why it is helpful to understand the marketplace pressures on players when they tugged open the doors to their local arcades and ambled over to their favorite machines. Between 1979 and 1982, a decision to put more than a bit of pocket change into an arcade machine was a decision to support a particular game and its maker, as well as a decision *not* to support the growing PC gaming and home console market. It was also a decision to leave behind the steadfast but inevitably obsolete pinball machine industry.

Such choices were not always subtle or subconsciously determined: as Andy Hofle's superb "Arcade Ambience" project brilliantly illustrates, arcade goers in 1981 were routinely assailed by a cacophony of come-ons by numerous video game manufacturers, as well as by the ubiquitous corner full of warmly glowing pinball machines that chimed, thumped, and occasionally even spoke.<sup>8</sup> Moreover, many of the machines in the arcade were made by the same companies that designed home console games: Atari, Data East, Bally, Sega, Gottlieb, and so on.<sup>9</sup> To wade into the acoustic pandemonium of an arcade, change a sawbuck into a pocket-busting stash of tokens, and set to work on initialing a nemesis machine's high-score screen required therefore a certain level of commitment. The dedication such behaviors signify illustrates the importance for scholars of attending to games (such as *Tempest*) in their marketplace contexts: *Tempest* makes meaning through its look and feel as a game—from its soundtrack to its cabinet and marquee art (if exposed)—but also as an object (one among



Fig. 15. 1980s arcade images (Arcade images found at the “Growing Up In Arcades: 1979–1989” Flickr group and used with permission from Rich Wiebke [richie 59].)

many) of consumer choice. Even before a coin slipped its slot, *Tempest* had to attract people: gamers, of course, but before that, arcade owners, and before that, game publishers. *Tempest*, Theurer, and Atari accomplished these persuasions effectively; the game was a marketplace and critical success. To set aside the increasingly potent pressures of the emerging home gaming market and, for that matter, the important but fading star of pinball, is to ignore key industrial and consumer pressure points that had lasting consequences on *Tempest*'s value and longevity as an arcade machine and licensable property.

To conclude our discussion of the consumer-oriented elements of *Tempest*, then, we offer two simple but telling lists—located at the end of the book—that demonstrate the competitive milieu within which *Tempest* existed. Appendix A includes all the major and most of the significant minor software and hardware companies that came into being in the timeframe beginning one year before Theurer began work on *Tempest* through 1982, a year after the game's release. Anyone even marginally familiar with the video game culture of the Atari VCS era forward will, upon browsing this



Fig. 16. 1980s arcade images (Arcade images found at the “Growing Up In Arcades: 1979–1989” Flickr group and used with permission from Rich Wiebke [richie 59].)

list, likely be struck by a sense of the improbability that arcades and arcade machines could survive to the end of the millennium. While trade publications of the time (e.g., *Play Meter*) increasingly published articles tinted with low-grade panic about how to keep customers coming through arcade doors, and while pinball manufacturers shifted their design emphases from the surfer and mod themes of the 1960s and 1970s to themes drawn from the outer space and video game crazes of the 1980s,<sup>10</sup> the home computer and home game console markets boomed (and occasionally busted) and the number of computer game software and hardware companies in North America, Europe, and Asia tripled.<sup>11</sup>

Hindsight is always exceptional, of course, especially when applied to such a tumultuous period in the game industry’s history. Still, the day’s pundits were well aware of the volatility of the video game industry as a whole, in large part because they were attentive to the combination of consumer spending and business trends. As George Ditomassi, the senior



Fig. 17. 1980s arcade images (Arcade images found at the “Growing Up In Arcades: 1979–1989” Flickr group and used with permission from Rich Wiebke [richie 59].)

vice president of Milton Bradley, noted in *Business Week*: “You’ve got a bloodbath coming in cartridges” (1982). As if the home video game craze were not enough to gut the arcade industry, the home video game crash of 1983–84, which Ditomassi prophesied, certainly did the trick.

The second list, included in Appendix B, features the arcade machines released between 1979 to 1982. These were the machines that surrounded *Tempest* in busy arcades and from which *Tempest* stood out. Even a quick glance over this appendix reveals several notable data points. For starters, the number of arcade machines being produced was on the rise—from sixty-seven in 1979 to 178 by 1982—but so too were the number of game manufacturers. In 1979, approximately thirty manufacturers were making arcade machines, but by 1982 there were sixty-four—a two-fold increase. Also discernible is the spike of interest in outer space: in 1979, roughly twenty-seven of the sixty-seven games (40 percent) had a space theme, the same number—though a very different percentage (15 percent)—as

in 1982. In 1980, however, at least sixty of the approximately 128 arcade machines produced (47 percent) contained games set in outer space. The national obsession with exploration beyond Earth's atmosphere, which as we noted earlier also triggered spikes in space-themed films and television programs in 1979 and 1980, was undoubtedly precipitated by the proliferation of actual space news in the mass media: the *Voyager* missions, SkyLab, and the new Space Shuttle program had captured people's imaginations and anxieties (judging by how this theme was often treated in its various fictive forms). In any case, when *Tempest* was delivered to arcades in October of 1981, the space theme was well entrenched in players' psyches as one that was thrilling and current. Similarly, vector graphics—a technology also on the rise, as the lists show—seemed to lend a well-matched aesthetic to the jointly trending fascination and fear that accompanied its proliferation.

In addition to a fusillade of arcade machines, 1979 through 1982 also brought to consumers extensive options for home video game play. In 1979, Milton Bradley released the Microvision, the world's first mobile game system based on interchangeable cartridge technology; Texas Instruments released its TI-99/4 game-cartridge-accepting home computer; and Atari circulated advertisements for its Cosmos game system, which was to use holographic imaging technology. The Cosmos, alas, was ultimately scrapped for fear of competing with Atari's 2600 system and because "Ray Kassar [President of Atari's Consumer Division] was too scared to take a chance on the handheld/tabletop market" (Atarimuseum.com, n.d.).<sup>12</sup> In 1980, Nintendo released the first eight of its immensely successful Game & Watch handheld systems, Mattel marketed the much hyped Intellivision console, Sinclair Research introduced the ZX80, and Acorn Computers brought out the Atom—the latter two being home computer systems marketed for their game playing capabilities. By the time *Tempest* was in development in 1981, Astrovision had released the Bally Computer System (a rebranded version of the 1977 Bally Professional Arcade, later renamed again to the Bally Astrocade), Acorn had released its BBC Microcomputer System, Coleco had released the Total Control 4 handheld two-player game console, Commodore released the VIC-20 Personal Color Computer, Sinclair released the ZX81, and Sega began to promote its upcoming SG-1000 console. As *Tempest* ascended in popularity through 1982, Atari released the 5200 system, Coleco released both its Gemini and ColecoVision consoles, Commodore released the Commodore 64, Emerson released the Arcadia 2001 system, Entrex released the Adventure Vision machine, Sinclair re-

leased the ZX Spectrum, and General Consumer Electronics released the Vectrex, a home gaming console built around a small vector graphics monitor. All told, nearly thirty home video gaming-capable machines made it to store shelves while *Tempest* was being developed, distributed, and played.

If nothing else, the proliferation was portentous: not only did the rush of consoles signal the end of the arcade as the only game in town, it also heralded the beginning of what would become the video game crash of 1983–84.<sup>13</sup> Simply put, the market was being flooded with too many options. In response, many consumers chose to spend their entertainment dollars on more conventional toys, while the income from consumers who did buy one of the available systems was spread so thinly that most of the companies either folded or were snatched up at a discount by larger companies.

That said, the flood of consoles and computers yielded a torrent of games. In 1979, the “voracious video-game market” (as one reporter would later call it) produced such legendary titles as *Akalabeth: World of Doom*, *Adventure*, and *Flight Simulator* (Polskin 1982, n.p.), and by 1980, Atari had converted the arcade hit *Space Invaders* into a 2600 cartridge, while *Rogue*, another legendary title (it occupies position #6 on *PC World’s* list of “10 Greatest PC Games Ever”) began to circulate freely among computer users around the world (Edwards 2009, n.p.). At the same time, Infocom released the first of its famous *Zork* titles, and the Apple II game *The Prisoner* (based on a popular television program) was published.

Still more notable titles arrived in 1981, as did two significant game journalism outlets: *Electronic Games* (US) and *Computer and Video Games* (UK), both subsequently recognized as founders of this area of reportage. Among the now famous games these magazines covered soon after their launch were *3D Monster Maze*, *Ultima I: The First Age of Darkness*, *Wizardry: Proving Grounds of the Mad Overlord*, *President Elect*, and *Castle Wolfenstein*. Needless to say, 1982 was just as energized, with console releases spanning the legendary (*Barnstorming*, *Megamania*, *E.T.: The Extra-Terrestrial*, *Utopia*, *Dragonstomper*, *Escape from the Mindmaster*, *Star Wars: The Empire Strikes Back*, *Prisoner 2*, *Wizardry II: The Knight of Diamonds*, *Ultima II: The Revenge of the Enchantress*) to the infamous (*Custer’s Revenge*, *Burning Desire*, and several other adult titles for the Atari 2600).

Perhaps the best popular indicators that home video games were beginning to supplant arcade games occurred in the middle and at the end of 1982. In June, *TV Guide’s* Howard Polskin published a feature article about Mattel’s video game development division (i.e., games for the Intellivision), and in December, cable station TBS rolled out *Starcade*, a game show in

which contestants played newly released arcade games for prizes and included two episodes in which a *Tempest* machine was the grand prize.<sup>14</sup> In what was clearly a desperate attempt to reinvigorate interest in arcade machines, *Starcade* was designed to reach out to the very people who were suddenly spending more time watching—and playing on—their televisions than playing video games at the mall, bowling alley, or corner bar.

### Conclusion

One last context we would like to touch on briefly en route to chapter 4 and an exploration of *Tempest*'s post-release life is the game's ludic context, or the playful environment in which it was most likely found. *Tempest* was delivered to video game arcades near their commercial and cultural zenith, at a time when these spaces were still full of people and machines. Golden era arcades were often loud (with music blared through ceiling speakers so as to be heard over the clamor of game sounds), dim (so as to better display game screens and lighted marquees), and smelly (while the olfactory characteristics of every arcade were different, they generally included a mixture of cigarettes, ozone, popcorn, carpet adhesive, and liberally applied teenage aftershave and perfume unable to quite mask the bountiful teenage B.O.). They were also performative and educational spaces: captivating games attracted players in crowds, making public performance a tangible part of the arcade experience. Commonly, younger players learned from older ones, not only play techniques but also more ritualistic behaviors such as the custom of letting quarters or tokens wait in line for a turn at the machine, queuing up coins along the screen bezel or the marquee frame of currently occupied machines. In fact, the performance/spectator dynamic became so common that by late 1981, higher end arcades began offering the option of "Auxiliary Show Monitors" (as Bally/Midway called them), view screens that sat on top of the most popular arcade machines so that as a crowd grew, people toward the back could also enjoy the action. As one Bally/Midway promotional flyer provocatively read: "Watching can almost be as much fun as playing" (Bally/Midway Manufacturing Company 1982).

To varying degrees, Dave Theurer's games enjoyed this kind of attention, drawing players and observers alike. While Theurer's first game—*Atari Soccer* (1979), an innovative four-player offering the likes of which is unusual even today—was popular due to its cooperative/competitive design, and Theurer's last game—*I, Robot* (1983), a 3-D shooter/art experiment—drew attention because of its unique look, unusual modes,

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Fig. r8. Bally/Midway auxiliary show monitor

and curious rules, it was Theurer's middle games—*Missile Command* and *Tempest*—that became arcade darlings.

With its large trackball, spare but intense sound effects, furious game play, and pointed geopolitical commentary, *Missile Command* was instantly popular and in fact stayed popular for years. The game involved protecting six cities and three anti-ballistic missile launch sites from ICBMs falling from the sky. Over the course of the game, the missiles fall faster, split

apart and become multiple warheads, and are periodically joined by an array of other flying and falling objects, from fighter planes to smart bombs to UFOs. When all six of the player's cities are destroyed, the playfield erupts with a nuclear cloud, which upon dissipation leaves only a devastated landscape and the ominous double entendre "Game Over."

Interestingly (but not surprisingly), *Tempest* and *Missile Command* have much in common. Both involve fending off waves of invaders that move along linear paths, both have enemies that fracture and multiply, and both employ unusual controls. While many of the arcade machines surrounding *Missile Command* and *Tempest*—Theurer's machines often co-existed in arcades, despite being released a year apart—used conventional buttons and eight-position joysticks, these two games used unusual physical interfaces that were also highly responsive and tactile. Additionally, neither game used music, a design choice that complemented their high-contrast playfields—bright colors against a black background. (Technically, there is one tiny piece of music in *Tempest*—assuming one does not categorize sound effects as music—but it is easily missed if one is not hyper-attentive. Upon reaching a score sufficient to be awarded a point bonus, there is a high-pitched, one-second long, arpeggio of six to eight notes that seems to be non-diegetic.)

With *Tempest*, however, Theurer moved away from the representational style of *Missile Command*, opting instead for what 3-D computer animators refer to as "primitives" (i.e., simple geometric shapes such as triangles, rectangles, and other sorts of polygons). As we detailed in chapter 1, these shapes comprise the game's playfield and the interactive objects that occupy it (i.e., the avatar and enemies), creating an abstract and distinctive experience. Thus, running across *Tempest* in an arcade could be startling. Lacking mutant animals, vengeful karatekas, and commonplace controls, *Tempest* encouraged attentiveness to the whole of a constantly and dynamically changing playfield. Its aesthetic was simple but deep, its controls unequivocal. And, unlike *Missile Command* where player guesses often pay off thanks to conjunctions of angles and the size of explosions, guesses in *Tempest* tend to destroy the shooter.

*Tempest's* mechanics were by no means unique, but combined with the precision lines of its vector graphics, the required mental and physical accuracy of play matched the visual precision of the game's thin lines. Other machines, too, had unforgiving play (e.g., *Frogger* [1981]), but their raster graphics often frustrated players, even those who had learned the vagaries of where the hardware perceived the back of one sprite and the front of

another. Not so with *Tempest*. When the shooter explodes into a set of concentric polygons, there is no ambiguity about how it happened: the shooter was touched—ever so slightly, but unmistakably—by an enemy. In arcades full of machines that depended on players' acceptance of the imprecision of raster graphics, *Tempest* offered a different experience, one that allowed a human to perform like a machine: perfectly. Indeed, *Tempest*'s vectors and precision control knob could enable impressive synchronization with the player's eyes and mind, and it is perhaps this experience of deep immersion combined with near absolute control that led to the mythic *Polybius* story—*Tempest* as a CIA brain-washing instrument—that we described in chapter 1. And once again, it is this tight integration among mind, body, screen, and interface that invokes the movie *Videodrome*, wherein the protagonist's body becomes one with a pistol—itsself reminiscent of a TV remote—which the protagonist ultimately uses to switch himself off.

As with any game, *Tempest*'s interactive context is diverse and expansive, and therefore inevitably and uniquely characterized by what each player brings to the game. Still, *Tempest*'s distinctive look and feel made it iconic.<sup>15</sup> To play *Tempest* was to play with the future, to touch the virtual, to leave behind raster cartoons for the wireframe building blocks of a vicinal tomorrow. It is to this tomorrow, the afterlife of *Tempest*, that we now attend.