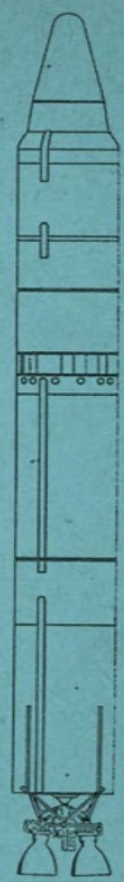
COMMAND AND CONTROL



NUCLEAR WEAPONS, the DAMASCUS ACCIDENT, and the ILLUSION OF SAFETY

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ERIC SCHLOSSER

AUTHOR OF FAST FOOD NATION

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COMMAND AND CONTROL

Nuclear Weapons, the Damascus Accident, and the Illusion of Safety

ERIC SCHLOSSER

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ENDPAPER ART BY GIDEON KENDALL

For my father

Ring the bells that still can ring
Forget your perfect offering
There is a crack, a crack in everything
That’s how the light gets in.

Leonard Cohen

CONTENTS

AUTHOR'S NOTE

This is a book about the effort to control nuclear weapons—to ensure that one doesn't go off b accident, by mistake, or by any other unauthorized means. The emphasis in these pages isn't on the high-level diplomacy behind arms control treaties. It's on the operating systems and the mind-set that have guided the management of America's nuclear arsenal for almost seventy years The history of similar efforts in the Soviet Union is largely absent here. Although no less important, such a history requires a knowledge of Russian archives and sources that I lack. *Command and Contr* explores the precarious balance between the need for nuclear weapon safety and the need to defend th United States from attack. It looks at the attempts by American scientists, policy makers, and militar officers to reconcile those two demands, from the dawn of the nuclear age until the end of the Cold War. And through the story of a long-forgotten accident, it aims to shed light on a larger theme: the mixture of human fallibility and technological complexity that can lead to disaster.

Although most of the events in this book occurred a long time ago, they remain unfortunately relevant. Thousands of nuclear warheads still sit atop missiles belonging to the United States and Russia, ready to be launched at a moment's notice. Hundreds more are possessed by India, China, Pakistan, Israel, North Korea, Great Britain, and France. As of this writing, a nuclear weapon has not destroyed a city since August 1945. But there is no guarantee that such good luck will last.

The fall of the Berlin Wall now feels like ancient history. An entire generation has been raised without experiencing the dread and anxiety of the Cold War, a conflict that lasted almost half a century and threatened to annihilate mankind. This book assumes that most of its readers know little about nuclear weapons, their inner workings, or the strategic thinking that justifies their use. I hope readers who are familiar with these subjects will nevertheless learn a new thing or two here. My own ignorance, I now realize, was profound. No great monument has been built to honor those who served during the Cold War, who risked their lives and sometimes lost them in the name of freedom. It was ordinary men and women, not just diplomats and statesmen, who helped to avert a nuclear holocaust. Their courage and their sacrifices should be remembered.

SELECTED CAST OF CHARACTERS

The Titan II Missile Combat Crew

Captain Michael T. Mazzaro, the commander, a young officer from Massachusetts with a pregnant wife
Lieutenant Allan D. Childers, the deputy commander, raised in Okinawa, a former DJ in his late twenties
Staff Sergeant Rodney L. Holder, the ballistic missile systems analyst technician, son of a Navy officer, responsible for keeping the Titan II ready to launch
Staff Sergeant Ronald O. Fuller, the missile facilities technician, responsible for the equipment at the launch complex
Lieutenant Miguel Serrano, a trainee studying to become a deputy commander

Propellant Transfer System Team A

Senior Airman Charles T. Heineman, the team chief
Senior Airman David Powell, an experienced Titan II repairman, twenty-one and raised in Kentucky
Airman Jeffrey L. Plumb, nineteen and from Detroit, a novice receiving on-the-job training

Propellant Transfer System Team B

Sergeant Jeff Kennedy, a quality control evaluator for the 308th Strategic Missile Wing, perhaps the best missile mechanic at Little Rock Air Force Base, a former deckhand from Maine in his midtwenties
Colonel James L. Morris, the head of maintenance at the 308th Strategic Missile Wing
Senior Airman James R. Sandaker, a young missile technician from Evansville, Minnesota
Technical Sergeant Michael A. Hanson, the team chief
Senior Airman Greg Devlin, a junior middleweight Golden Gloves boxer
Senior Airman David L. Livingston, a twenty-two-year-old missile repairman from Ohio with a fondness for motorcycles

Civilians In and Around Damascus

Sid King, the twenty-seven-year-old manager of a local radio station
Gus Anglin, the sheriff of Van Buren County
Sam Hutto, a dairy farmer with land across the road from the missile site

The Disaster Response Force

Colonel William A. Jones, the head of the force as well as the base commander
Captain Donald P. Mueller, a flight surgeon manning the force's ambulance
Richard L. English, head of the Disaster Preparedness Unit, a civilian in his late fifties, still fit and athletic, nicknamed "Colonel," who'd served in the Air Force for many years
Technical Sergeant David G. Rossborough, an experienced first responder

Security Police Officers

Technical Sergeant Thomas A. Brocksmith, the on-scene police supervisor at the accident site
Technical Sergeant Donald V. Green, a noncommissioned officer in his early thirties who volunteered to escort a flatbed truck to Launch Complex 374-7
Technical Sergeant Jimmy E. Roberts, a friend of Green's who accompanied him on the drive to Damascus

At the Little Rock Command Post

Colonel John T. Moser, commander of the 308th Strategic Missile Wing

At the SAC Command Post in Omaha

General Lloyd R. Leavitt, Jr., the vice commander in chief of the Strategic Air Command

At Barksdale Air Force Base in Lousiana

Colonel Ben G. Scallorn, a Titan II expert at the Eighth Air Force who'd worked with the missiles since the first silos were built

The Manhattan Project

General Leslie R. Groves, director of the project, who led the effort to build an atomic bomb

J. Robert Oppenheimer, a theoretical physicist, later known as "the father of the atomic bomb," who served as the first director of th Los Alamos Laboratory

Edward Teller, a physicist later known as "the father of the hydrogen bomb," often at odds with the other Los Alamos scientists

George B. Kistiakowsky, a chemist and perhaps the nation's leading explosives expert, later the science adviser to President Dwight D. Eisenhower

Scientists and Engineers at the Weapons Labs

Bob Peurifoy, an engineer from Texas who joined Sandia in 1952 and subsequently became its leading advocate for nuclear weapo safety

Harold Agnew, a physicist from Colorado who helped create the first manmade nuclear chain reaction, filmed the destruction of Hiroshima from an observer plane, and played an important role in nuclear weapon safety efforts at the Los Alamos Laboratory

Carl Carlson, a young physicist at Sandia who in the late 1950s recognized the vulnerability of a nuclear weapon's electrical syster during an accident

Bill Stevens, an engineer who became the first head of Sandia's nuclear safety department and worked closely with Bob Peurifoy

Stan Spray, a Sandia engineer who burned, crushed, and routinely tortured nuclear weapon components to discover their flaws

Military Leaders

General Curtis E. LeMay, an engineer who revolutionized American bombing techniques during the Second World War and turned the Strategic Air Command into the most powerful military organization in history

General Thomas S. Power, an Air Force officer who led the firebombing of Tokyo during the Second World War, followed LeMay the Strategic Air Command, and gained the reputation of being a mean son of a bitch

General Maxwell D. Taylor, an Army officer who championed the nuclear strategy of limited war and served as influential adviser t President John F. Kennedy

Officials in Washington, D.C.

David E. Lilienthal, the first chairman of the Atomic Energy Commission and a strong believer in civilian control of nuclear weapor

Fred Charles Iklé, a RAND analyst who studied the potential consequences of an accidental nuclear detonation and later served as undersecretary of defense in the Reagan administration

Donald A. Quarles, an engineer whose work at Sandia, the Department of the Air Force, and the Department of Defense helped to promote nuclear weapon safety

Robert S. McNamara, a former automobile executive who, as secretary of defense during the Kennedy and Johnson administrations struggled to formulate a rational nuclear strategy

ACRONYMS AND ABBREVIATIONS

A-Bomb—an atomic bomb, a weapon deriving its explosive power from the fission of uranium or plutonium atoms

AEC—Atomic Energy Commission, the civilian agency created in 1947 to oversee nuclear weapons and nuclear power

AFSWP—Armed Forces Special Weapons Project, a military agency formed in 1947 to deal with nuclear weapons

B.E. Number—a unique eight-digit number that identifies each of the targets in the Air Force's *Bombing Encyclopedia*

BMEWS—Ballistic Missile Early Warning System, the radar system built after *Sputnik* to detect Soviet missiles heading toward the United States

BOMARC—a ground-launched antiaircraft missile with an atomic warhead, designed by Boeing (BO) and the Michigan Aerospace Research Center (MARC), that was deployed at sites in the United States and Canada

CND—Campaign for Nuclear Disarmament, a British antiwar group whose logo later became known as the "peace symbol"

DEFCON—Defense Readiness Condition, the American military's readiness for hostilities, ranked on a scale from DEFCON 5 (the lowest level of alert) to DEFCON 1 (nuclear war)

DEW Line—the Distant Early Warning Line, a radar system that extended across the Arctic in North America to detect Soviet bombers

DIRECT—Defense Improved Emergency Message Automatic Transmission System Replacement Command and Control Terminal, the Pentagon computer system currently deployed to send and receive a nuclear attack order

DUL—the Deliberate, Unauthorized Launch of a missile

ENIAC—the Electronic Numerical Integrator and Computer, America's first large-scale electronic, digital computer, built for the Army to calculate the trajectory of artillery shells and later used at Los Alamos to help design a thermonuclear weapon

EOD—Explosive Ordnance Disposal, the rendering safe of warheads, bombs, and anything else that might detonate

FCDA—the Federal Civil Defense Administration, which from 1951 until 1979 advised the American public on how to survive a nuclear war

H-Bomb—a hydrogen bomb, the most powerful weapon ever invented, deriving its explosive force not only from nuclear fission b also from nuclear fusion, the elemental power of the sun

ICBM—Intercontinental Ballistic Missile, a missile that can propel a nuclear warhead more than 3,400 miles

JAG—the nickname for a military attorney, a member of the Judge Advocate General's Corps

K crew—a backup crew for the Titan II missile, on call to give advice during an emergency

LOX—liquid oxygen, a propellant that was used as an oxidizer, in combination with rocket fuel, to launch Atlas and Titan I missile

MAD—Mutually Assured Destruction, a nuclear strategy that seeks to maintain peace by ensuring that adversaries have the capabil to destroy one another

MANIAC—the Mathematical Analyzer, Numerical Integrator, and Computer, an early electronic, digital computer used at Los Alamos to help design the first hydrogen bombs

MART—Missile Alarm Response Team, the security police who responded to problems at Titan II missile sites

MFT—Mobile Fire Team, a heavily armed four-man team of Air Force security officers

MIMS—Missile Inspection and Maintenance Squadron, the repair crews who kept Titan II missiles ready to launch

MIRV—Multiple Independently targetable Reentry Vehicle, a ballistic missile carrying two or more warheads that can be aimed at different targets

MIT—Massachusetts Institute of Technology

MSA—a nickname for the vapor-detection equipment built by the Mine Safety Appliance Company and installed in Titan II silos

NATO—North Atlantic Treaty Organization, the military alliance formed in 1949 to defend Western Europe against an attack by th Soviet Union

NORAD—North American Air Defense Command, an organization created in 1958 by the United States and Canada to defend against a Soviet attack, later renamed the North American Aerospace Defense Command

NRC—Nuclear Regulatory Commission, the federal agency that licenses and regulates civilian nuclear power plants

OPLAN—Operations Plan, the term used since 2003 to describe the nuclear war plans of the United States

PAL—Permissive Action Link, a coded device installed within a nuclear warhead or bomb, much like a lock, to prevent unauthoriz use of the weapon

PK—Probability of Kill, the likelihood of a target being destroyed

PPM—Parts per Million

PTPMU—Propellant Tank Pressure Monitor Unit, the gauge in a Titan II launch control center that provided digital readouts of the fuel and oxidizer pressures within the missile

PTS—Propellant Transfer System, the facilities and equipment used to handle the fuel and oxidizer for a Titan II missile

RAF—Royal Air Force, the armed service in Great Britain that during the Cold War was responsible for land-based aircraft and missiles

RAND—a think tank in Santa Monica, California, created by the Air Force after the Second World War, whose name was derived from the phrase "Research ANd Development"

RFHCO—Rocket Fuel Handler's Clothing Outfit, a liquidproof, vaporproof outfit with an air pack and a bubble helmet that looked like a space suit, commonly known among Titan II crews as a "ref-co"

RV—Reentry Vehicle, the nose cone of a missile containing its warhead

SAC—Strategic Air Command, the organization that until 1992 was responsible for the long-range bombers, the land-based missile and most of the nuclear weapons deployed by the U.S. Air Force

SAGE—Semi-Automatic Ground Environment, an air defense system built in the late 1950s that linked hundreds of radars into a network guided by computers in real time

SIOP—Single Integrated Operational Plan, the name given to the nuclear war plan of the United States from 1960 until 2003

SOCS—Strategic Operational Control System, a communications network employed by the Strategic Air Command during the 195 featuring a red telephone at its headquarters in Omaha that could be used to call every SAC air base simultaneously and broadcast a war order through their loudspeakers

SRAM—Short-Range Attack Missile, a missile with a nuclear warhead, launched from the air to hit targets on the ground, that was carried mainly by B-52 bombers, from the early 1970s until 1993

TAC—Tactical Air Command, the organization that from 1946 until 1992 was responsible for the ground support fighter planes of the U.S. Air Force

TACAMO—Take Charge and Move Out, a communications system created by the U.S. Navy that uses aircraft to transmit a nuclea attack order during an emergency

TASS—Telegraphic Agency of the Soviet Union (Telegrafnoe Agentstvo Sovetskogo Soyuza), the official news agency of the Sovi government

TATB—1,3,5-triamino-2,4,6-trinitrobenzene, an "insensitive" high explosive that cannot easily be detonated by fire, shock, or impact

USAAF—United States Army Air Forces, the organization responsible for America's land-based bombers during the Second World War

USAF—United States Air Force, the new and independent armed service that replaced the USAAF in 1947

WSEG—Weapon Systems Evaluation Group, a high-level research unit, employing both military and civilian personnel, that from 1948 until 1976 advised the Joint Chiefs of Staff

WWMCCS—World Wide Military Command and Control System, an organization formed during the Kennedy administration to

combine the sensors, computers, command posts, and communications networks of the different armed services into a single centralized system

ZI—Zone of the Interior, a phrase used by the military to describe the continental United States

PART ONE

THE TITAN

Not Good

On September 18, 1980, at about six thirty in the evening, Senior Airman David F. Powell an Airman Jeffrey L. Plumb walked into the silo at Launch Complex 374-7, a few miles north of Damascus, Arkansas. They were planning to do a routine maintenance procedure on a Titan II missile. They'd spent countless hours underground at complexes like this one. But no matter how many times they entered the silo, the Titan II always looked impressive. It was the largest intercontinental ballistic missile ever built by the United States: 10 feet in diameter and 103 feet tall, roughly the height of a nine-story building. It had an aluminum skin with a matte finish and U.S. AIR FORCE painted in big letters down the side. The nose cone on top of the Titan II was deep black, and inside it sat a W-53 thermonuclear warhead, the most powerful weapon ever carried by an American missile. The warhead had a yield of 9 megatons—about three times the explosive force of all the bombs dropped during the Second World War, including both atomic bombs.

Day or night, winter or spring, the silo always felt the same. It was eerily quiet, and mercury vapo lights on the walls bathed the missile in a bright white glow. When you opened the door on a lower level and stepped into the launch duct, the Titan II loomed above you like an immense black-tipped silver bullet, loaded in a concrete gun barrel, primed, cocked, ready to go, and pointed at the sky.

The missile was designed to launch within a minute and hit a target as far as six thousand miles away. In order to do that, the Titan II relied upon a pair of liquid propellants—a rocket fuel and an oxidizer—that were "hypergolic." The moment they came into contact with each other, they'd instantly and forcefully ignite. The missile had two stages, and inside both of them, an oxidizer tank rested on top of a fuel tank, with pipes leading down to an engine. Stage 1, which extended about seventy feet upward from the bottom of the missile, contained about 85,000 pounds of fuel and 163,000 pounds of oxidizer. Stage 2, the upper section where the warhead sat, was smaller and held about one fourth of those amounts. If the missile were launched, fuel and oxidizer would flow throug the stage 1 pipes, mix inside the combustion chambers of the engine, catch on fire, emit hot gases, an send almost half a million pounds of thrust through the supersonic convergent-divergent nozzles beneath it. Within a few minutes, the Titan II would be fifty miles off the ground.

The two propellants were extremely efficient—and extremely dangerous. The fuel, Aerozine-50, could spontaneously ignite when it came into contact with everyday things like wool, rags, or rust. A a liquid, Aerozine-50 was clear and colorless. As a vapor, it reacted with the water and the oxygen in the air and became a whitish cloud with a fishy smell. This fuel vapor could be explosive in proportions as low as 2 percent. Inhaling it could cause breathing difficulties, a reduced heart rate, vomiting, convulsions, tremors, and death. The fuel was also highly carcinogenic and easily absorbed through the skin.

The missile's oxidizer, nitrogen tetroxide, was even more hazardous. Under federal law, it was

classified as a “Poison A,” the most deadly category of man-made chemicals. In its liquid form, the oxidizer was a translucent, yellowy brown. Although not as flammable as the fuel, it could spontaneously ignite if it touched leather, paper, cloth, or wood. And its boiling point was only 70 degrees Fahrenheit. At temperatures any higher, the liquid oxidizer boiled into a reddish brown vapor that smelled like ammonia. Contact with water turned the vapor into a corrosive acid that could react with the moisture in a person’s eyes or skin and cause severe burns. When inhaled, the oxidizer could destroy tissue in the upper respiratory system and the lungs. The damage might not be felt immediately. Six to twelve hours after being inhaled, the stuff could suddenly cause headaches, dizziness, difficulty breathing, pneumonia, and pulmonary edema leading to death.

Powell and Plumb were missile repairmen. They belonged to Propellant Transfer System (PTS) Team A of the 308th Strategic Missile Wing, whose headquarters was about an hour or so away at Little Rock Air Force Base. They’d been called to the site that day because a warning light had signaled that pressure was low in the stage 2 oxidizer tank. If the pressure fell too low, the oxidizer wouldn’t flow smoothly to the engine. A “low light” could mean a serious problem—a rupture, a leak. But it was far more likely that a slight change in temperature had lowered the pressure inside the tank. Air-conditioning units in the silo were supposed to keep the missile cooled to about 60 degrees. If Powell and Plum didn’t find any leaks, they’d simply unscrew the cap on the oxidizer tank and add more nitrogen gas. The nitrogen maintained a steady pressure on the liquid inside, pushing downward. It was a simple, mundane task, like putting air in your tires before a long drive.

Powell had served on a PTS team for almost three years and knew the hazards of the Titan II. During his first visit to a launch complex, an oxidizer leak created a toxic cloud that shut down operations for three days. He was twenty-one years old, a proud “hillbilly” from rural Kentucky who loved the job and planned to reenlist at the end of the year.

Plumb had been with the 308th for just nine months. He wasn’t qualified to do this sort of missile maintenance or to handle these propellants. Accompanying Powell and watching everything that Powell did was considered Plumb’s “OJT,” his on-the-job training. Plumb was nineteen, raised in suburban Detroit.

Although an oxidizer low light wasn’t unusual, Air Force technical orders required that both men wear Category I protective gear when entering the silo to investigate it. “Going Category I” meant getting into a Rocket Fuel Handler’s Clothing Outfit (RFHCO)—an airtight, liquidproof, vaporproof, fire-resistant combination of gear designed to protect them from the oxidizer and the fuel. The men called it a “ref-co.” A RFHCO looked like a space suit from an early-1960s science fiction movie. It had a white detachable bubble helmet with a voice-actuated radio and a transparent Plexiglas face screen. The suit was off white, with a long zipper extending from the top of the left shoulder, across the torso, to the right knee. You stepped into the RFHCO and wore long johns underneath it. The black vinyl gloves and boots weren’t attached, so the RFHCO had roll-down cuffs at the wrists and the ankles to maintain a tight seal. The suit weighed about twenty-two pounds. The RFHCO backpack weighed an additional thirty-five and carried about an hour’s worth of air. The outfit was heavy and cumbersome. It could be hot, sticky, and uncomfortable, especially when worn outside the air-conditioned silo. But it could also save your life.

The stage 2 oxidizer pressure cap was about two thirds of the way up the missile. In order to reach it, Powell and Plumb had to walk across a retractable steel platform that extended from the silo wall. The tall, hollow cylinder in which the Titan II stood was enclosed by another concrete cylinder with nine interior levels, housing equipment. Level 1 was near the top of the missile; level 9 about twenty feet beneath the missile. The steel work platforms folded down from the walls hydraulically. Each one had a stiff rubber edge to prevent the Titan II from getting scratched, while keeping the gap between the platform and the missile as narrow as possible.

The airmen entered the launch duct at level 2. Far above their heads was a concrete silo door. It was supposed to protect the missile from the wind and the rain and the effects of a nuclear weapon detonating nearby. The door weighed 740 tons. Far below the men, beneath the Titan II, a concrete flame deflector shaped like a *W* was installed to guide the hot gases downward at launch, then upward through exhaust vents and out of the silo. The missile stood on a thrust mount, a steel ring at level 7 that weighed about 26,000 pounds. The thrust mount was attached to the walls by large springs, so that the Titan II could ride out a nuclear attack, bounce instead of break, and then take off.

In addition to the W-53 warhead and a few hundred thousand pounds of propellants, many other things in the silo could detonate. Electroexplosive devices were used after ignition to free the missile from the thrust mount, separate stage 2 from stage 1, release the nose cone. The missile also housed numerous small rocket engines with flammable solid fuel to adjust the pitch and the roll of the warhead midflight. The Titan II launch complex had been carefully designed to minimize the risk of having so many flammables and explosives within it. Fire detectors, fire suppression systems, toxic vapor detectors, and decontamination showers were scattered throughout the nine levels of the silo. These safety devices were bolstered by strict safety rules.

Whenever a PTS team member put on a RFHCO, he had to be accompanied by someone else in a RFHCO, with two other people waiting as backup, ready to put on their suits. Every Category I task had to be performed according to a standardized checklist, which the team chief usually read aloud over the radio communications network. There was one way to do everything—and only one way. Technical Order 21M-LGM25C-2-12, Figure 2-18, told Powell and Plumb exactly what to do as they stood on the platform near the missile.

“Step four,” the PTS team chief said over the radio. “Remove airborne disconnect pressure cap.”

“Roger,” Powell replied.

“Caution. When complying with step four, do not exceed one hundred sixty foot-pounds of torque. Overtorquing may result in damage to the missile skin.”

“Roger.”

As Powell used a socket wrench to unscrew the pressure cap, the socket fell off. It struck the platform and bounced. Powell grabbed for it but missed.

Plumb watched the nine-pound socket slip through the narrow gap between the platform and the missile, fall about seventy feet, hit the thrust mount, and then ricochet off the Titan II. It seemed to happen in slow motion. A moment later, fuel sprayed from a hole in the missile like water from a garden hose.

“Oh man,” Plumb thought. “This is not good.”

New Wave

Earlier that day, Second Lieutenant Allan D. Childers had gotten out of bed around five, showered, put on his uniform, kissed his wife good-bye, grabbed his overnight bag, and headed for the predeparture briefing at Little Rock Air Force Base. Childers was the deputy commander of a Titan II missile combat crew. At seven o'clock every morning, the crews about to pull an alert gathered in a large room at the headquarters of the 308th Strategic Missile Wing. The 308th operated eighteen Titan II launch complexes in Arkansas, each with a single missile and a four man crew. The wing's motto was *Non sibi sed aliis*—"Not for self but for others." While senior officers and staff stood in the front of the briefing room, each combat crew sat at its own small table.

Childers took a seat with his crew. Captain Michael T. Mazzaro was the commander, a brilliant young officer from Massachusetts, about five foot eight, with thinning brown hair. Staff Sergeant Rodney L. Holder was the missile systems analyst technician, the one who made sure the missile was always ready to go. He looked a lot like Childers, tall and thin with fair hair and glasses. Staff Sergeant Ronald O. Fuller, handsome and baby faced, from Elmira, New York, was the missile facilities technician. His job focused on the workings of the launch site. Once or twice a week, the fo of them began their days at one of these briefings and then spent the next twenty-four hours together underground, monitoring their missile; supervising maintenance at the site; constantly practicing, training, and awaiting the order to launch.

Childers hardly fit the stereotype of a warmongering Strategic Air Command (SAC) officer, eage to nuke the Soviets and bring on Armageddon. For about a year before joining the Air Force, he'd bee a late-night radio DJ who played mainly acid rock, spent his days surfing, and had hair down to his shoulders. He wasn't a hippie, but he also wasn't harboring any lifelong ambition to become a spit-and-polish military officer. He'd spent most of his childhood on the Japanese island of Okinawa, where his father was an aircraft maintenance mechanic for the Air Force. The family home was a Quonset hut, a prefabricated steel building dating back to the Second World War. Although the accommodations were far from luxurious, growing up on that island during the 1960s was idyllic. Childers spent a lot of time lying on the beach and scuba diving. At Kadena Air Force Base the social divide between officers and enlisted men like his father was almost impossible to bridge. The two groups did not mix. But at the local high school nobody seemed to care about military ranks or racial distinctions. White, black, and Asian kids hung out together, and at various times Childers dated not only the daughter of a major but also the daughter of a colonel. Most of the students had a mother or father in the armed services. The Vietnam War wasn't a distant, abstract conflict debated in the classroom; it touched almost every household directly. Childers had two brothers and a sister, and they were all proud of their father. But none of them wanted anything to do with the military.

After graduating from high school in 1971, Childers went to the University of Arizona, hoping to

become an engineer. He dropped out after a few semesters, returned to Okinawa, and found work as a disc jockey at a radio station on the island. He was nineteen, the youngest employee at the station, an they gave him the late-night shift. It was a dream job. From midnight until six in the morning, Childers played his favorite music—Led Zeppelin, Neil Young, Janis Joplin, Jimi Hendrix, Creedenc Clearwater Revival. GIs would call the station and make requests. He loved dedicating songs on their behalf and reading messages on the air to their families and girlfriends. After work he'd sleep until noon, and then hit the beach.

The station in Okinawa went off the air in 1973, and Childers moved to Tampa, Florida, hoping to enroll in radio school. But he didn't have enough money for tuition and, after a few months of lookin for work, decided to join the Air Force. He expected to wind up in Vietnam, one way or another. Serving at an air base sounded a lot better than carrying a rifle and fighting in the jungle. When Childers enlisted, he filled out a form requesting an assignment with the Armed Forces Radio and Television Service. He thought the Air Force might provide his training to become a radio announcer But he filled out the form incorrectly and got assigned to the newspaper at Norton Air Force Base in San Bernardino, California. He enjoyed the job and fell for Diane Brandeburg, a budget analyst who worked down the hall. In 1975 his commander persuaded him to become an officer, which would require a college degree. Through the Airman Scholarship and Commissioning Program, he attended Chaminade College of Honolulu, a good place to study and to surf. Diane was stationed at nearby Hickam Air Force Base, and they were married in 1977.

All three of Childers's siblings eventually served in the military. His older brother enlisted in the Army, his sister in the Air Force, his younger brother in the Navy. And all of them wound up with spouses who'd either served in the military or been raised in military families. Childers later realized that they'd been drawn back to a familiar way of life. It offered a good education, a sense of mission, the chance to do something useful, and a strong feeling of comradeship with others who'd chosen to serve.

In the hierarchy of Air Force officers, the fighter pilots and bomber pilots each claimed to be at th top. Despite their intense rivalry, the pilots agreed on at least one thing: missileers occupied a rung fa below them. Serving in an underground control center lacked the glamour of flying sorties into enem territory or gaining command of the skies. Childers's poor eyesight disqualified him from becoming an Air Force pilot, and the missile corps needed officers. Although he knew nothing about intercontinental ballistic missiles (ICBMs) and even less about what a missile officer did, he signed up for the program before graduating from college. He didn't care about the status or traditional Air Force snobbery. The job sounded interesting, and it offered the opportunity to command.

Childers spent six months studying Titan II operations at Sheppard Air Force Base in Texas and Vandenberg Air Force Base in California. Like all Titan II trainees, he carefully read the *Dash-1*, the technical manual that explained every aspect of the missile system. He spent hours in simulators, mock-ups of the control center where launch checklists and hazard checklists were practiced again an again. But he never saw a real Titan II missile until he pulled his first alert in Arkansas and stepped into the silo. It felt cold in there, like walking into a refrigerator, and the missile looked really big.

If an emergency war order arrived from SAC headquarters, every missile crew officer would face decision with almost unimaginable consequences. Given the order to launch, Childers would comply without hesitation. He had no desire to commit mass murder. And yet the only thing that prevented th Soviet Union from destroying the United States with nuclear weapons, according to the Cold War theory of deterrence, was the threat of being annihilated, as well. Childers had faith in the logic of nuclear deterrence: his willingness to launch the missile ensured that it would never be launched. At Vandenberg he had learned the general categories and locations of Titan II targets. Some were in the Soviet Union, others in China. But a crew was never told where its missile was aimed. That sort of

knowledge might inspire doubt. Like four members of a firing squad whose rifles were loaded with three bullets and one blank, a missile crew was expected to obey the order to fire, without bearing personal responsibility for the result.

After six weeks of training at Little Rock, Childers became the deputy commander of a Titan II site in 1979. The following year he was promoted, joining Mazzaro, Holder, and Fuller on an instructor crew. Unlike a typical crew that spent months or years pulling alerts at the same launch complex, an instructor crew brought trainees to different sites. On the morning of September 18, Childers and his crew were planning to bring a student, Second Lieutenant Miguel Serrano, to an overnight alert at Launch Complex 374-5, outside the town of Springhill. The crew always liked goin to "4-5." It was closer to the base than some of the other complexes, which meant they could get ther faster and get home sooner the next day.

Predeparture briefings always started with a roll call. Once it was clear that every launch complex would be fully staffed, the wing's senior officers talked to the eighty or so combat crew members about maintenance issues, new safety guidelines, changes in the emergency war order, and the latest weather report. The weather was a crucial factor in any maintenance work that involved fuel, oxidize or the reentry vehicle. Sometimes the briefings included a slide presentation on intelligence issues an the state of the world.

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ON SEPTEMBER 18, 1980, the world was unsettled. The president of Iraq, Saddam Hussein, had announced the previous day that the treaty defining the border between his country and Iran was no longer in effect. Troops from the two nations were already fighting skirmishes in southern Khuzestan Iran's foreign ministry had condemned "the hostile invasion . . . by the Iraqi regime," and a war over the disputed territory seemed imminent. In Tehran, fifty-two American hostages were still being held captive, almost a year after being seized at the U.S. embassy there. A failed rescue attempt by the U.S. military, during the spring of 1980, had prompted Iran's Revolutionary Guards to remove the hostage from the embassy and scatter them at locations throughout the city. Televised images of Iranian crowds burning American flags and shouting "Death to the Great Satan!" had become a nightly routine, and the American government seemed powerless to do anything about it.

Meanwhile, relations between the United States and the Soviet Union had reached their lowest point since the Cuban Missile Crisis in 1962. The Soviets had invaded Afghanistan nine months earlier, deploying more than 100,000 troops in a campaign that many feared was just the first stage o a wider assault on the oil-producing nations of the Middle East. The United States had responded to the invasion by imposing a grain embargo on the Soviet Union and boycotting the recent Summer Olympics in Moscow. Neither of those punishments, however, seemed likely to force a Soviet withdrawal from Kabul. The influence of the United States seemed everywhere in decline. On September 17, the International Institute for Strategic Studies, a prominent British think tank, issued report suggesting that the Soviet Union's new and more accurate ICBMs had made America's ICBM vulnerable to attack. The United States was falling behind not only in nuclear weaponry, the report claimed, but also in planes, tanks, and ground forces.

Amid this discouraging international news, the mood of the American people seemed equally downbeat. The economy of the United States was in recession, with high inflation and an unemployment rate of about 8 percent. Gasoline shortages raised the prospect of rationing and federa limits on automobile use. Watergate, the Vietnam War, and the energy crisis had shaken faith in the ability of government to accomplish anything. The president of the United States, Jimmy Carter, had offered his own harsh critique of the national state of mind. During a speech broadcast by the three

major television networks in prime time, the president warned that the United States faced an invisib threat: "a crisis in confidence." Old-fashioned American optimism had been replaced by a despairing self-absorbed worship of consumption. "Piling up material goods," Carter said, "cannot fill the emptiness of lives which have no purpose or meaning." The speech ended on a more practical note, outlining half a dozen steps to support renewable energy and eliminate the dependence on foreign oil The underlying message, however, was that the nation's most important problems could never be solved by Congress or the president, and Carter urged viewers to assume responsibility for their own fate. "All the legislation in the world," he said, "can't fix what's wrong with America."

Many Democrats and Republicans disagreed. They thought that Jimmy Carter was the problem, n some vague, existential crisis of the American soul. It was a presidential election year, and Carter ha gained the Democratic nomination after a bitter primary fight with Senator Edward M. Kennedy. Despite the victory, Carter's approval ratings plummeted. The Iranian hostage crisis brought more ba news every day, and an official report on the failed rescue attempt—describing how eight American servicemen died and half a dozen U.S. helicopters full of classified documents were abandoned in the desert—raised doubts about the readiness of the military. Although Carter was a devout Christian, a newly created evangelical group, the Moral Majority, was attacking his support for legalized abortion and a constitutional amendment to guarantee equal rights for women. A midsummer opinion poll found that 77 percent of the American people disapproved of President Carter's performance in the White House—a higher disapproval rate than that of President Richard Nixon at the height of Watergate.

The Republican candidate for president, Ronald Reagan, had a sunnier disposition. "I refuse to accept [Carter's] defeatist and pessimistic view of America," Reagan said. The country could not afford "four more years of weakness, indecision, mediocrity, and incompetence." Reagan called for large tax cuts, smaller government, deregulation, increased defense spending to confront the Soviet threat, and a renewed faith in the American dream. A popular third-party candidate, Congressman John B. Anderson, described himself as a centrist, labeling Reagan a right-wing extremist and Carter "a bumbler." Anderson agreed that things had gone fundamentally wrong in the United States. "Peopl feel that the country is coming apart at the seams," he said.

The nation's underlying anxiety fueled sales of a bestselling nonfiction book in late September: *Crisis Investing: Opportunities and Profits in the Coming Great Depression*. A number of bestselling novels also addressed the widespread fears about America's future. *The Devil's Alternative*, by Frederick Forsyth, described a Soviet plot to invade Western Europe. *The Fifth Horseman*, by Larry Collins and Dominique Lapierre, described a Libyan plot to blackmail the United States with a hydrogen bomb hidden in New York City. *The Spike*, by Arnaud de Borchgrave and Robert Moss, tol the story of a left-wing American journalist who uncovers Soviet plans for world domination but cannot persuade his liberal editor to publish them.

Perhaps the most influential bestseller of the year was *The Third World War: August 1985*, a nove written by a retired British officer, General Sir John Hackett. It offered a compelling, realistic accou of a full-scale war between NATO and the Soviet bloc. After a long series of European tank battles, the British cities of Birmingham and Wolverhampton are incinerated by a Soviet nuclear strike. The Russian city of Minsk is hit by nuclear weapons in retaliation, and the shock of its destruction causes the swift collapse of the Soviet Union. The moral of the story was clear: the United States and its allies needed to increase their military spending. "In the last few years before the outbreak of war the West began to wake up to the danger it faced," Hackett wrote, "and in the time available did just enough in repair of its neglected defenses to enable it, by a small margin, to survive." Ronald Reagan later called *The Third World War* an unusually important book. And it helped to launch a new literary genre, the techno-thriller, in which military heroism was celebrated, the intricate details of weaponry

played a central role in the narrative, and Cold War victories were achieved through the proper application of force.

On television, *The Waltons*, a long-running drama about an ordinary family's struggles during the Great Depression, was facing cancellation. Instead of worrying about how the show's young protagonist, John-Boy, would overcome adversity, American viewers were now far more interested in who'd shot J.R., the wealthy lead character of a new series, *Dallas*. Other family dramas about the rich and dysfunctional soon followed: *Dynasty, Falcon Crest, The Colbys*. Situation comedies dealing with topical or working-class issues—like *M*A*S*H, Maude, Sanford and Son, All in the Family*—were relics of a different era. In Hollywood, the year 1980 marked the end of the highly personal, director-driven filmmaking of the previous decade. Aside from Martin Scorsese's *Raging Bull* and Robert Redford's *Ordinary People*, due to open on September 19, the most notable movies were big-budget comedies, action pictures, and sequels like *Smokey and the Bandit II*.

The popular music of a historical moment can be more memorable and evocative than its books, politics, or films. A number of songs released in 1980 had the ability to worm their way into your brain and resist all attempts to dislodge them: "Do That to Me One More Time," by Captain & Tennille; "You May Be Right," by Billy Joel; "Sailing" and "Ride Like the Wind," by Christopher Cross. Disco was finally dead, its fate sealed by the closing of the nightclub Studio 54 and the opening of *Can't Stop the Music*, a movie starring the Village People. Punk was dead, too, and taking its place was the lighter, dance-oriented New Wave of Devo, The Police, The B-52's, and Talking Heads. The hard rock of The Rolling Stones had given way to the softer pop sounds of "Emotional Rescue." Led Zeppelin broke up, transforming Van Halen into America's favorite heavy metal band. Turning the radio dial, on almost every FM station, you could hear rough edges becoming smooth. Outlaw country no longer threatened the Nashville establishment. It had fully entered the mainstream, with Willie Nelson's hit "On the Road Again" and Waylon Jennings's "Theme from the *Dukes of Hazzard*." Bob Dylan now refused to sing any of his old songs. Born again and on the road, he played only gospel. John Lennon was in New York City, recording a new album for the first time in years and looking forward, in a few weeks, to his fortieth birthday. "Life begins at forty," Lennon told an interviewer. "It's like: *Wow!* what's going to happen next?"

In retrospect, it's easy to say that a particular year marked a turning point in history. And yet sometimes the significance of contemporary events is grasped even in the moment. The United States of the 1960s and the 1970s, with its liberalism and countercultural turmoil, was about to become something different. The year 1980, the start of a new decade, was when that change became palpable in ways both trivial and telling. During the first week of September, the antiwar activist and radical Abbie Hoffman surrendered to federal authorities after more than six years on the run. Before turning himself in, Hoffman sat for a prime-time television interview with Barbara Walters. Another radical leader, Jerry Rubin, had recently chosen a different path. In 1967, Hoffman and Rubin had tossed dollar bills over the balcony at the New York Stock Exchange as a protest against the evils of capitalism. In 1980, Rubin took a job as an investment analyst on Wall Street. "Politics and rebellion distinguished the '60's," he explained in the *New York Times*. "Money and financial interest will capture the passion of the '80's." Rubin had once again spotted a cultural shift and tried to place himself at its cutting edge. At the time, the highest-paid banker in the United States was Roger E. Anderson, the head of Continental Illinois National Bank, who earned about $710,000 a year. The incomes on Wall Street would soon rise. Suits and ties were back in fashion. Mustaches, beards, and bell-bottoms had become uncool, and an ironic guide to the new zeitgeist, *The Official Preppy Handbook*, was just arriving in stores. During a speech at the Republican convention that summer, Congressman Jack Kemp had noted what others did not yet acknowledge or see: "There is a tidal wave coming, a political tidal wave as powerful as the one that hit in 1932, when an era of Republican

dominance gave way to the New Deal.”