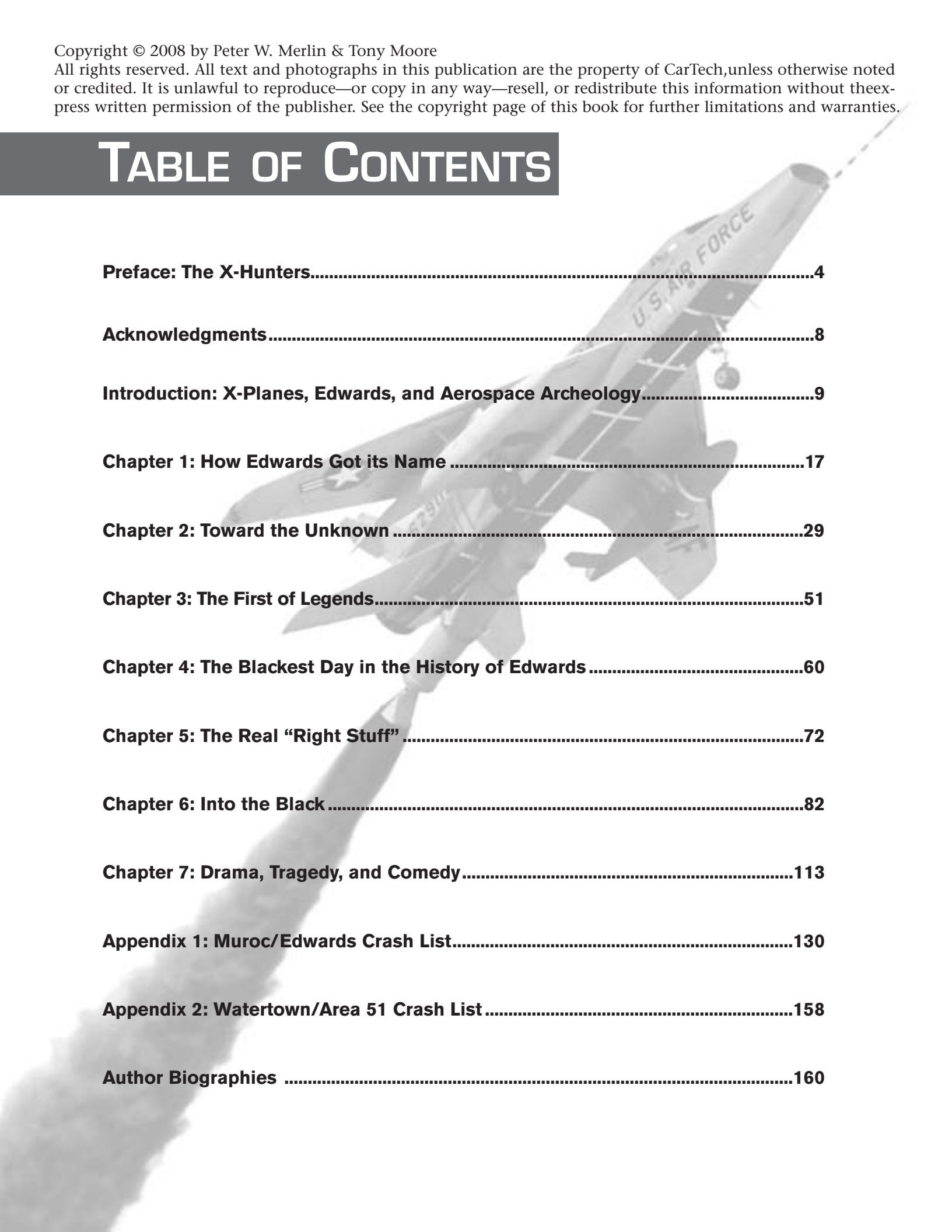


TABLE OF CONTENTS



Preface: The X-Hunters.....	4
Acknowledgments.....	8
Introduction: X-Planes, Edwards, and Aerospace Archeology.....	9
Chapter 1: How Edwards Got its Name	17
Chapter 2: Toward the Unknown	29
Chapter 3: The First of Legends.....	51
Chapter 4: The Blackest Day in the History of Edwards	60
Chapter 5: The Real “Right Stuff”	72
Chapter 6: Into the Black	82
Chapter 7: Drama, Tragedy, and Comedy.....	113
Appendix 1: Muroc/Edwards Crash List.....	130
Appendix 2: Watertown/Area 51 Crash List.....	158
Author Biographies	160



The world's first supersonic airplane, the Bell X-1, was carried aloft beneath a modified B-29. Due to ground-clearance limitations, a special pit was constructed on the parking ramp at Muroc Army Airfield in order to allow technicians to secure the rocket plane to the bomber's belly. (AFFTC History Office)

TOWARD THE UNKNOWN

Flight research in the 1940s and 1950s was characterized by efforts to expand the performance envelope of airplanes to supersonic speeds and altitudes near the edge of space. The first major effort in this direction was Bell Aircraft Company's rocket-powered research airplane, originally dubbed the XS-1 for Experimental Sonic but later shortened to X-1.

Engineers had determined that a .50-caliber bullet was capable of exceeding the speed of sound. In order to design a manned supersonic airplane, they simply scaled up the projectile's shape, added wings and tail surfaces, included provisions for a pilot, controls mechanisms, life-support systems, and a liquid-fueled rocket engine. The result was a sleek airplane capable of successfully navigating the transonic and low supersonic flight regimes.

Three X-1 airplanes were built for a research program involving Bell, the Army Air Forces, and the National Advisory Committee for Aeronautics (NACA). The single-seat craft was designed for launch from beneath a modified B-29 bomber for glide and powered flights, prior to making an unpowered landing on tricycle-type gear.

The first X-1 was completed in late December 1945 and underwent glide trials at Pinecastle Army Airfield near Orlando, Florida, beginning in January 1946. After the initial 10 unpowered tests were completed at Pinecastle in March, the aircraft was returned to the Bell factory for installation of a rocket engine. Test operations then moved to Muroc.

During testing at Muroc, the first X-1 was flown in a series of contractor handling-qualities tests. It

was then turned over to the Air Force for envelope expansion flights and maximum performance trials, including the first manned supersonic flight. On 14 October 1947, Capt. Charles E. “Chuck” Yeager achieved a speed of Mach 1.06 (700 mph) at an altitude of 43,000 feet. After the second X-1 was used to complete a series of contractor test flights, it was turned over to the NACA for research into the characteristics of transonic stability and control. The third X-1 only completed one glide flight.

Toward Mach 2

Just one month after Yeager broke the so-called “sound barrier,” the Air Force authorized a study to develop a second-generation X-1 with significantly increased performance. The resulting design incorporated the same wing, horizontal tail, and engine as the first-generation airplane. New design features included a redesigned fuselage, improved cockpit, and increased fuel capacity. Three airframes, designated X-1A, X-1B, and X-1D were built in order to allow test pilots to investigate aerodynamic phenomena and airplane performance at speeds greater than Mach 2 and altitudes above 90,000 feet. A high-speed armament systems testbed called the X-1C was proposed but never built.

The X-1D was completed first and was slated for heat-transfer research. It arrived at Edwards Air Force Base in July 1951, suspended from the modified bomb bay of a Boeing EB-50A. The X-1D was equipped with a new low-pressure fuel system, a slightly increased fuel capacity, and minor changes in cockpit instrumentation.



The X-1A and X-1B were slightly larger than their predecessors. New design features included an improved cockpit and increased fuel capacity. (AFFTC History Office)

On 24 July, with Bell company test pilot Jean “Skip” Ziegler at the controls, the X-1D was launched over Rogers Dry Lake on what was to become the only successful flight of its career. The unpowered glide was completed after a nine-minute descent, but upon landing, the nose gear failed and the aircraft slid ungracefully to a stop. Repairs took several weeks to complete and a second flight was scheduled for mid-August.

Mystery Explosions

The mission on 22 August 1951 initially seemed routine, with the X-1D carried aloft by the EB-50A for what was to be its first powered flight. The crew of the mother plane included pilot Maj. Wilbur Sellers (who, sadly, would be dead less than 24 hours later in the crash of a Lockheed F-94B) and flight test engineer Maj. Jack Ridley. Chase pilots included Gen. Albert Boyd in a North American F-86 and Col. Gust Askounis in a Lockheed T-33.

As the mated aircraft ascended through 7,000 feet, Lt. Col. Frank K. “Pete” Everest entered the cockpit of the X-1D with Ridley’s assistance. Everest noted that the nitrogen source pressure indicator was giving a very low reading. After discussing the problem with Bell engineer Wendell Moore, who was aboard the EB-50, the decision was made to abort the mission and jettison the X-1D’s propellants.

Shortly after Everest climbed back into the cockpit to initiate the jettison process, he began pressurizing the liquid oxygen tank, and then closed the valve to check the tank pressure indicator. Next, he reopened a valve to bring

the pressure up to the necessary level for jettisoning.

Suddenly, an explosion rocked the aircraft. Askounis, in the chase plane beneath the EB-50A, saw flames and smoke. He called on the radio, “Hey, Pete! Drop her! Drop her! She’s on fire!”

Everest saw flames and smoke pouring from the X-1D and jumped from the rocket plane’s cockpit into the EB-50A, knocking Ridley down before he had a chance to pull the emergency jettison handle. This may have inadvertently saved the lives of all aboard because the removable locking pins on the shackles holding the X-1D in place were still fastened. Had Ridley tried to initiate emergency jettison, the burning research craft would have become jammed in place and burned inside the bomber’s belly.

Moments later, Ridley made his way to the cockpit and pulled the normal release handle. The X-1D, still burning fiercely, plunged toward the desert. Less than a minute later, the rocket plane was a twisted pile of wreckage in the scrub southwest of Rogers Dry Lake.

Despite an extensive investigation, the cause of the explosion remained a mystery for several years. An accident review board concluded that the most likely cause was a leak in the fuel system that created an explosive mixture of alcohol and air, which may have been ignited by an electrical spark from the rocket plane’s radio transmitter or external power supply. Such speculation ultimately proved erroneous.

With the loss of the X-1D, and still awaiting the arrival of the X-1A and X-1B, the test team turned to the last of the original X-1 models. A captive test of the aircraft was conducted on 9 November 1951, to serve as a dress rehearsal for its first powered flight. Carried aloft



The X-1D was the first of the second-generation “Mach busters” to fly. Unfortunately, it completed just one subsonic glide flight. The airplane was lost to an explosion during preparations for its first powered flight. (AFFTC History Office)



This launch photo of a second-generation X-1 illustrates how it must have looked when the X-1D was jettisoned from the mothership. (AFFTC History Office)

beneath the EB-50A, the X-1 carried a full load of alcohol and liquid oxygen propellants. During the flight, Bell test pilot Joseph Cannon planned to jettison distilled water to simulate hydrogen peroxide. As had occurred on the X-1D, loss of nitrogen source pressure resulted in cancellation of the jettison test and the X-1 was returned to Edwards with a full fuel load.

After landing, the EB-50A was towed to the east end of the parking ramp and positioned so Cannon could safely jettison propellants from the X-1. During the procedure, the rocket plane exploded. With the help of ground personnel, Cannon escaped but suffered serious burns.

A lengthy investigation yielded only a variety of unsubstantiated theories about possible causes, such as a catastrophic failure in the liquid nitrogen system. Unfortunately, the hidden flaw leading to the explosion would claim more X-planes before it was finally found.

One of these was the second Bell X-2, lost over Lake Ontario in May 1953 during a captive flight from Bell’s plant at Buffalo, New York. An explosion occurred during tests of the rocket plane’s liquid oxygen system, ripping the plane away from the B-50 mothership and resulting in the deaths of Bell test pilot Skip Ziegler and crewman Frank Wolko. Although the wreckage of the X-2 was never found, an accident review board again determined that an electrical malfunction must have ignited an explosive mix of alcohol and oxygen vapor. It would be two more years before the true cause was found.

Speed and Altitude

The X-1A arrived at Edwards on 7 January 1953. Following completion of contractor testing and some



An F-86 chase plane accompanies the X-1A as it glides toward a lakebed landing at Edwards following engine shutdown. (NASA)