The Track to Survival

Someone had to find out if a pilot could eject from an airplane at supersonic speed and live.

BY JOHN L. FRISBEE

On October 14, 1947, Capt. Chuck Yeager broke the sound barrier in the experimental rocket-propelled X-1. Scientists and engineers now knew that an airplane and its pilot could safely fly faster than the speed of sound. But could a pilot bail out at such speed and survive? That was a question that had to be answered quickly, for USAF's first supersonic fighters were just over the horizon.

It was certain that the wind blast on leaving the cockpit could dislocate limbs and break bones. There also would be rapid—almost instantaneous—deceleration, subjecting the pilot to very high G loads. Some scientists thought the human body could endure no more than eighteen Gs, or eighteen times the force of gravity—far less than a pilot would experience in a supersonic bailout.

Two approaches to the problem were evident: first, build a complex, heavy, expensive ejection capsule for the pilot; second, find out what stresses an unprotected human *could* survive. The Air Force assigned the second approach to flight surgeon Lt. Col. John Paul Stapp, a bachelor with a philosophical bent, a quiet sense of humor, a love of classical music, and unquenchable curiosity.

Under Colonel Stapp's direction, Northrop Aircraft Co. built at Edwards (then Muroc) AFB, Calif., a 2,000-foot rail track for a rocket-driven "sled" that could accelerate to nearly 1,000 mph. Toward the end of the track, scoops beneath the sled would dig into a pool of water, jerking the sled from several hundred miles an hour to a stop in just over a second, simulating the deceleration of a high-speed ejection. Early passengers were dummies. At the end of one run, the safety harness broke and the dummy plunged through a one-inch wood windscreen, sailing 700 feet across the desert. A few more rides, a few improvements, and it was time for the first human passenger.

In December 1947, Paul Stapp began riding the sled at increasing speeds. By May of the following year, he had rocketed down the track sixteen times and withstood a force of thirty-five Gs during deceleration. So much for the eighteen-G limit of human endurance.

What was the sudden stop like? Colonel Stapp reported: "It felt as though my eyes were being pulled out of my head. . . . I lifted my eyelids with my fingers, but I couldn't see a thing. . . . They put me on a stretcher, and in a minute or two I saw some blue specks. . . . In about eight minutes . . . I saw one of the surgeons wiggle his fingers at me, and I was able to count them. Then I knew my retinas had not been detached, and that I wasn't going to be blind."

Stapp hits the water brake at the end of a 632-mph rocket sled run.

Colonel Stapp continued to ride the sled at Edwards until 1953, when he was sent to Holloman AFB, N. M., to work with a longer track and an improved sled called *Sonic Wind*. There, on December 10, 1954, the forty-four-year-old Stapp rode the sled to a record 632 miles an hour, decelerating to zero in a second and a quarter with a force of more than forty Gs. Momentarily his body weight was about 6,800 pounds. Wind blast and deceleration were equivalent to a high-altitude ejection at supersonic speed.

Out of these wild rides came improved helmets, arm and leg restraints, better aircraft seats, stronger safety harnesses, and techniques for positioning the body to help absorb unearthly forces. And for Paul Stapp? During his twenty-nine rides came several retinal hemorrhages, cracked ribs, and two broken wrists. The second he set himself while walking back to the Aero Medical Field Laboratory that he headed.

Colonel Stapp was named winner of the Cheney Award for 1954. That award recognizes acts of "valor, extreme fortitude, or self-sacrifice in a humanitarian interest performed in connection with aircraft." That same year, he also won AFA's Theodore von Kármán Trophy for distinguished service in the field of aerospace science. But for unassuming Paul Stapp, the greatest reward was the knowledge that he had helped make a dangerous profession a little less hazardous—that many jet pilots who had to abandon their planes were still alive and flying.

War is the breeding ground of heroes. In times of peace, few have the opportunity or the dedication and courage to risk permanent injury or death, as Lt. Col. John Paul Stapp did repeatedly, so that others may live. He exemplified in extraordinary measure "the noble quality we call valor." ■