In Flight USA

Testing the Limits: Experimental Test Pilot Chuck Tucker

By ZQ TAYLOR

Experimental test pilots court unknown demons outside the flight envelope. These aviators willingly put themselves in harm's way, feigning it's the only thing they know how to do. Chuck Tucker of Northrop X-4 Bantam and YB-49 Flying Wing fame was a pilot during the pinnacle of aviation test pioneering in the 1940s, 50s, and 60s, when safety margins and standardized procedures were practically non-existent, and danger was an understatement. Tucker is a man who has spent pretty much his entire life surviving one harrowing event after another. From his days with the 23rd Fighter Group to the early days of flight testing, this man of perpetual motion chalks up most of it to luck.

A little luck and a lot of tenacity

Growing up in the Depression Era, Charles J. Tucker was a wiry, tenacious kid who built airplane models, but did not spend his days dreaming of becoming the next Lucky Lindy or Buck Rogers. Then a college classmate took Tucker for a plane ride in a 1935 Luscombe. It was the first time Tucker had been airborne—and the last time he questioned his future.

Like most Americans living during that time period, Tucker learned to fly by the seat of his pants, so to speak, making the most of instinct and opportunities rather than some well-thought out plan. With a newly discovered passion for flight, he learned to fly, then enlisted in the Army Air Corps in June 1941 as an aviation cadet.

The Hump to China and the 23rd Fighter Group

Based at Morrison Field in West Palm Beach, Florida, Tucker racked up hours in B-17, B-18, and B-24 aircraft, until April 19, 1942, when his squadron
boarded C-47s—with orders to an unknown destination. After nearly a month of hops, the Army Air Corps pilots landed in Kunming, China. And Tucker's 5'8" body was wracked with dysentery.

Chuck Tucker in 1948 after maiden test flight of Northrop X-4. (Photo Courtesy: Chuck Tucker.)

The man who fetched a doctor was none other than Claire Chennault, the brazen commander of the American Volunteer Group (AVG), better known as the Flying Tigers. Chennault's physician gave Tucker a small dose of opium, which immediately cured the young aviator. Chennault took to the feisty pilot and commandeered Tucker as his personal ferry pilot during the very days that the AVG was transitioning to the 23rd Fighter Group.

Tucker flying with the 23rd Fighter group over China. (US Navy)

Enthralled to be *almost* in the thick of it, Tucker asked to join one of the new squadrons. In August 1942, those orders were granted and Tucker was soon flying an assortment of P-40s

with the 75th Fighter Squadron under the capable command of Colonel Robert L. Scott, of later autobiography fame with God is My Co-Pilot.

The squadron's mission was clear: attack and destroy the enemy by strafing airfields, troops, and supply depots, while protecting the skies over China. After a summer of strafing and four air-to-air kills against Japanese Zero fighter planes, Tucker was shot down by ground fire over Northern Indochina in the highly mountainous region of HaGiang.

Enough Chinese to Save His Life

With luck as his co-pilot, Tucker once again landed on his feet—eventually. After jumping from his bullet-riddled fighter, he tumbled into a steep canyon ravine, and heard barking dogs and nearing Japanese. Tucker scrambled up the hill, eventually losing his enemies. Cautiously, the withering aviator approached a Chinese garrison.

"I knew enough Chinese to save my life," Tucker says. "A Chinese soldier pointed a gun to my head, perhaps mistaking me for a Vichy Frenchman, so I said the only Chinese phrase I knew over and over. 'I am American. Not a Frenchman. I shoot down Japanese airplanes.' "

It worked. A small band of Chinese soldiers and a bony pony escorted Tucker for five days through dense terrain to the nearest airstrip with a telephone. His squadron retrieved the beleaguered Tucker.

"I was so relieved to get back to base, to safety. Then I had to hunt down my clothes," Tucker recollected with a chuckle. The custom in those days was to divvy up a dead pilot's clothes.

Experimental Flights for Northrop

Tucker was once again at the right place at the right time. After the war, he did a stint with the 412th Fighter Group, raced a cropped-wing P-63 at the Cleveland National Air Races, and tested production P-80s at Lockheed. Then, he was hired by Northrop in 1948 to test fly the first X-4 Bantam. It is rare for a test pilot to make the first flight of a new design and he was thrilled at his good fortune.

Tucker arrived at Northrop in Hawthorne, California, before the X-4 was off the assembly line. The X-4 was built to investigate tailless configurations at transonic speeds, on the premise that eliminating the horizontal tail might also eliminate stability problems at that velocity.

On the Flying Wings over Tomorrow

While waiting for the X-4, Tucker busied himself flying co-pilot in the B-35 and YB-49 Flying Wing. Air Force test pilots Daniel Forbes and Glen Edwards were killed in June 1948, while performing stall tests in the YB-49, and the Air Force and Northrop wanted to attempt to duplicate those tests. Tucker drew the short straw for the risky assignment.

Perhaps one of the most talked about, orphic airplanes ever built, the doomed YB-49 no longer exists, but the vortex of conspiracy theories and cloaked mysteries continues. Tucker's assignment was to perform 24 stall tests in forward c/g, working back gradually to try and stall. There were no telemetering or chase planes with the Forbes/Edwards tests; so much of Tucker's testing was incremental, based on adjustments from each previous stall test. Tucker requested a chase plane and a YB-49 flight engineer to shift fuel to alter the c/g.

"I remember the plane just started to fall so I began my recovery and it did a snap roll, and wham! It went around twice, so fast I couldn't believe it," Tucker says. "I recovered by giving it the old flight school recover—left rudder and full forward stick. It recovered inverted and I was flying upside down at about 10,000 feet above the ground. The inboard ailerons induced a very slow roll rate and I thought if I roll it, I'm not going to make it, I'm going to hit the ground."

Tucker pulled through the roll with a half loop at 3,000 feet and 2.5 Gs, according to the accelerometer mounted in his cockpit. When he finally recovered and had landed, someone on the ground asked if Tucker was going to do another one.

"I'd gotten away with something that day; I had been in trouble and was lucky to recover. Forbes and Edwards started their test at 20,000 feet, I started at 30,000. If I'd started at 20,000 I'd have ended up on the ground, too. I was just lucky," he says.

Buckle up and enjoy the X-4

Northrop built two X-4s, Air Force serial numbers 46-676 and 46-677. Everything was hydraulic except the electric rudder on this experimental aircraft. Tucker flew 46-676 on

December 16, 1948, after three aborted takeoff attempts due to slow rudder response and yaw controllability issues.

"It was a little beast, that one. When I'd push on the rudder, it would take three or four seconds to go full deflection. I'd put in some rudder, but couldn't keep up with it," Tucker says of the first X-4. "My first day out as the official X-4 experimental test pilot nearly killed me. That airplane was flying me and I was just holding on for the ride," remembers Tucker.

Tucker accidentally went supersonic one day in the second X-4. He was finishing a last X-4 test, with Colonel Al Boyd, commanding officer at Muroc, as the chase pilot. At 40,000 feet over the Mojave, Tucker had the nose pointed down toward the hangar at a 20-degree dive angle, moving fast. He pulled back on the throttle and opened the speed brakes controlled by a nimble stick-mounted trigger, but the aircraft continued to accelerate.

"At 35,000 feet, I felt the rumble," says Tucker. "I knew I was going fast but the aircraft was supposed to be self limiting. At 30,000 feet, the vibrations were gone and the X-4 accelerated effortlessly. We had a flight recorder in the cockpit, otherwise I'm not sure anyone would have believed what was really going on up there."

It didn't take long for Walt Williams of NACA (predecessor of NASA) to telephone Tucker. Williams informed him that the X-4 went supersonic that day at 1.02 Mach speed. Then Williams wanted to know how Tucker had done it.

"I told Walt that I think I just happened to hit the right level of temperature at the right time, that I'd tweaked the brakes, and that the aircraft just slicked through the speed," Tucker said.

NACA took the aircraft for some experimenting of its own.

Still Soaring with Ingenuity

While Tucker flew many different aircraft through the years and has since retired from aviation corporations, he still tests, tinkers, and experiments with flight. His latest accomplishment is a remote-controlled invention—a blended body aircraft model with an aspect ratio of one. Blended-body designs flatten the lifting surface of traditional tube-and-wing architecture to optimize aerodynamic efficiency. The lower the aspect ratio, the more square the design.

The Tucker Vortex is a blended body invention designed not to stall. (Photo Courtesy: Chuck Tucker.)

Dubbed the Tucker Vortex, his square-bodied design looks like something out of an old Buck Rogers episode, but flies like something from a dream—executing rolls, loops, and tight turns up to 10 Gs with no tendencies to depart from expected performance specs. The Tucker Vortex is seen regularly at the model airplane field in Morgan Hill, California.

Tucker has not typically been splashed across the covers of glam magazines, but he has *always* been on the leading edge of experimental aviation. I asked Mr. Tucker how he might sum up his years of flying many of the world's most memorable aircraft and the experiences and skill he's garnered in hundreds of cockpits.

"Flying—there's nothing to it. With a little luck, if you can make the nose go where you want it to go, you can fly," says Tucker.

Well, Mr. Tucker, I think you've proven that it's a little more than that.