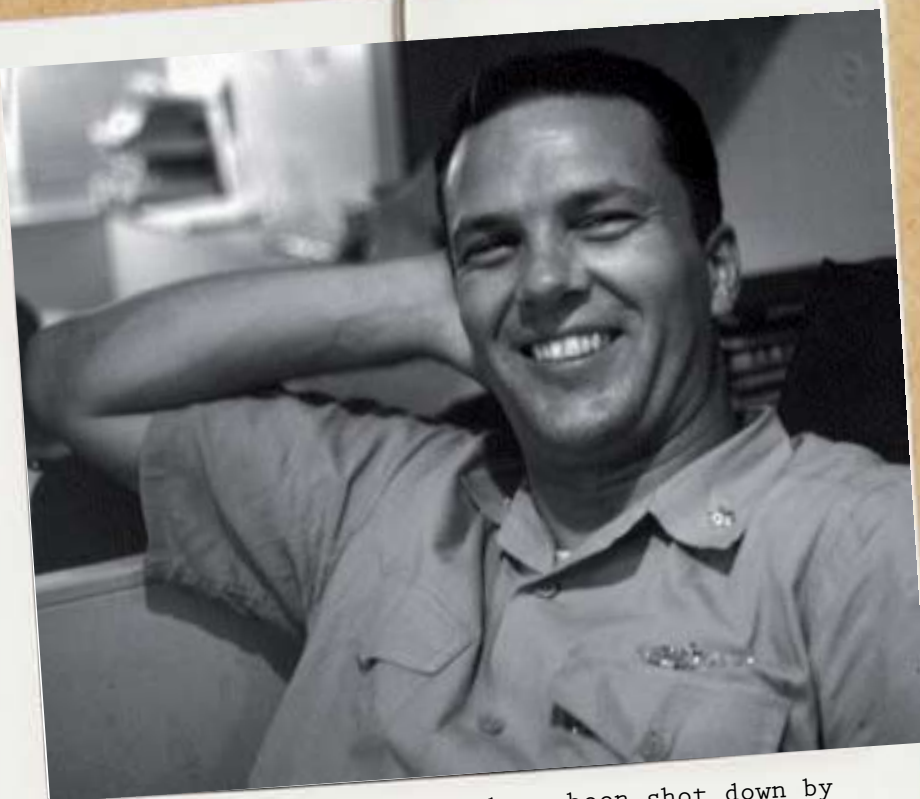


TRAILBLAZERS

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It is a dubious accolade to have been shot down by one's own missile, but as Pete Purvis discovered, some things are just going to happen

The day I shot myself down

Pete Purvis

My friends have often introduced me with the unforgiving phrase, 'Hey, I'd like you to meet the guy who shot himself down.' This honor belongs to myself and another Grumman test pilot, Tommy Attridge, who managed to fly his F-11F-1 fighter into a hail of 20mm rounds he had just fired during supersonic gunnery testing. Several years later, as a test pilot for Grumman Aerospace flying out of Point Mugu, California, I found a more modern way to do this using a Sparrow missile and the F-14A Tomcat, which, at the time, was the Navy's fighter of the future.

More than three decades later, that day – June 20, 1973 – remains extremely sharp in my memory. And with good reason. It wasn't a dark, stormy night. The midday sun was bright in the clear southern sky. The Californian Channel Islands off Point Mugu stood out against the glistening ocean below as Bill 'Tank' Sherman and I flew west toward the test area in the Pacific Missile Test Range. Tank and I had known each other since we were in the same class in the US Navy's F-4 replacement air group training. He already had a combat tour under his belt as a Navy Radar Intercept Officer (RIO) and was good at his business. Analytical, competent and cool, he was the kind of pilot you wanted to have along when things got hectic. I learned the real value of a good RIO over North Vietnam while flying combat missions in the F-4B Phantom from the USS Coral Sea.

One of the myriad development tests of a tactical airplane is weapons separation, whether those weapons are bombs or missiles. That day, we were testing a critical point in the Sparrow missile launch envelope. We weren't testing the missile's ability to kill airplanes, only its ability to clear our airplane safely when fired. The crucial test point took place at Mach 0.95, 5,000ft altitude and zero g, and it consisted of firing Raytheon AIM-7 Sparrow missiles from the farthest aft station (Number 4) in the 'tunnel' that is under the F-14 between the two engines where most missiles are mounted in semi-submerged launches in the tunnel with two of its eight cruciform wings (four forward, four aft) inserted into the slots in each launcher. These triangular fins are 16in wide and, when the missile is attached to the launcher, stick into the bottom of the fuselage.

The test point for that day was in the heart of the low-altitude transonic range where the high-dynamic pressure flow fields close to the fuselage are mysterious. The zero g launch parameter meant the missile would not get any help from gravity as it was pushed away from the airplane by the two semicircular feet embedded in the launcher mechanism. Each of these feet was attached to a cylinder that contained a small explosive charge that was set off by pulling the trigger on the stick.

This particular launch was not thought to be risky from a pure separation standpoint because preceding Sparrow launches from the F-14 wing pylon, forward and mid-fuselage positions in identical flight conditions had demonstrated favorable release dynamics, and good clearance between the missile and the aircraft throughout the entire launch sequence. In fact, the missile company Raytheon, on the basis of its own aerodynamic analysis,



The F-14 was the United States Navy's primary maritime air superiority fighter

was concerned that the missile would severely pitch nose down as it had on two of the three prior launches at this condition, and possibly be so far below the aircraft as it passed the F-14's nose radar that it could, in the real world for which it was designed, lose the rear antenna radar signal and compromise the target acquisition portion of the missile trajectory.

Raytheon engineers had predicted a 2ft clearance. Independent Grumman wind tunnel tests confirmed the Raytheon analysis. However, this was not to be the case for this launch.

During the preflight briefing, the engineers once again displayed graphs that showed the predicted missile-to-fuselage clearance as a function of the time after trigger pull. As expected, clearance was seen to be tight. But we had the utmost confidence in Grumman's separation engineer, Tom Reilly, and his data. All previous launch data used during build-ups had come out on the money. We were good to go.

The test missile was a dummy AIM-7E-2, an obsolescent model of the Sparrow with the same form, and function as the AIM 7-F, the missile scheduled for the fleet. The 7E2's casing, however, was slightly thinner than the 7F's.

The rest of the briefing was routine. After the routine ground checks, we took off and flew directly to our test location about 80 miles offshore between Santa Rosa and San Nicolas Islands, directly west of Los Angeles. The test crew has two primary jobs: to hit a specific data point (aircraft attitude, altitude, airspeed, g loading) in the most efficient manner; and to relate unusual phenomena and analysis to the folks back on the ground. On this day, the second part was covered by several million dollars' worth of test instrumentation. This was very fortunate, because things were about to get exciting.

We hit our point in the sky (567 KIAS, 5,000ft, zero g) and I pulled the trigger: 'Ka-whumpf!!! A much louder 'ka-whumpf' than we had ever experienced before. The missile appeared in my peripheral vision as it passed from beneath the left nacelle. It was tumbling end over end, spewing fire. 'That's weird', I thought.



The F-14 entered service in 1974 with the US Navy, replacing the F-4 Phantom II. It was retired in 2006

My first real thought was, 'I'll bet stray foreign debris pieces enter the left engine'. My instant analysis seemed to be confirmed a few seconds later when the master caution light flashed in front of me. My eyes jumped to the caution panel, which had begun to light up like a pinball machine!

'HORIZONTAL TAIL' and 'RUDDER AUTHORITY', numerous lesser lights, and 'BLEED DUCT' (that's the one that usually came on before fire warning lights) blinked at me. I disregarded all but the 'bleed duct' light and tried to punch it out by turning off the bleed air source. That didn't work! Now the chase told me I was venting fuel, and had 'a pretty good fire going'.

"How good is that?" I asked in my cool-guy, smart-ass best. "There's the left fire warning light!" I shut down the left engine, which didn't work either. As I reached for the left fuel shut-off handle, the nose pitched up violently, so sharply in fact that the force of more than 10g curled me into fetal position. I couldn't reach either the face curtain or the alternate handle between my legs. It didn't take long for me to figure out that I was no longer in control of the situation.

'Eject, Tank, eject', were my thoughts, and as the high g force (data said it peaked at 1.3 seconds) bled off to a point at which one of us could reach the face curtain, either Tank or I initiated the ejection sequence, and in just one second we went from raucous noise and confusion to almost complete peace and quiet.

The ejection was smooth and, after my body completed about four somersaults, my chute opened. The opening shock was gentler than I had expected. In fact, I hardly noticed it. All the action from missile launch to our ejection took only 39 seconds. It seemed much longer. We had ejected at an estimated 350kts, having bled off 150-200kts in the pitch up, and at 7,000ft we were 2,000ft higher than we started. Post-accident analysis of the instrumentation showed the violent nose-up maneuver was caused by a full nose-up stabilator command, the result of a probable burn-through of the control rod that actuated nose-down commands. Had the stabilator command gone full nose-down, these words would not be written.

As I stopped swinging in the chute, I saw Tank about 225ft away and 100ft below me. We waved at each other to indicate we were in good shape. We'd hoped to wave at a helicopter, which had launched a few minutes after we'd ejected, but to travel 80 miles in a helo flying at 120kts takes a long time. Our airplane descended in a slow, shallow left spiral, burning fiercely in a long plume reaching from the trailing edge of the wing to

well beyond the tail. On impact, it broke up and scattered pieces across a 100ft radius. The largest chunk was the left portion of the tail section, which floated in a pool of pink hydraulic fluid.

The parachute ride was calm, serene, and long. The only noise was the chase plane roaring by several times. As I hung in the chute, my thoughts turned to the next phase: water survival. The sea below was calm. I wondered whether the crash sound had alerted the sharks, which must be lurking hungrily below awaiting their next meal? Oddly, that was the last time I thought of sharks for the rest of the day because my mind soon became otherwise engaged. Sharks weren't something I could control, but water entry was, so I began to go through my water survival tactics. I pulled the right handle of the seat pan to release my life raft, which was supposed to remain attached to the pan on the end of a long yellow lanyard, or so I'd been told. I peered carefully below, but saw no raft or shadow on the water. Pulled the left one. Still no sign.

Bear in mind that the last time I had hung in a parachute harness was in preflight some 16 years before. I wasn't about to perform a creative search for my life raft using chute steering or other acrobatics best left to the 82nd Airborne. Nor did I care to enter the water in other than the prescribed manner, so I gingerly walked my fingers up the risers and found the parachute's quick-release fittings, so I could actuate them when I hit the water to avoid becoming tangled in shrouds, yet another way to die.

After what seemed like a very long time hanging below the chute, the water suddenly rushed up at me, an event that according to survival school anecdotes signaled impending water entry. I plummeted about 10ft under, then bobbed to the top while trying to actuate my life vest all the way. In my state of diminished IQ, I had forgotten that very basic step on the way down. I flailed about the surface, kicking, treading water with one hand and searching for the life-vest toggle with the other, then treading water with both. My addled brain realized that this maneuver wasn't going to be a long-term survival technique. It is better to submerge if you must, open your eyes and find the damned toggles, or you're going to die. Doing so, I found the right one, pulled it, and once again ascended to the surface, this time from about 8ft down. Next, find the left toggle. Now that I was floating, I figured I didn't need to perform my immersion act again, so I somewhat calmly found the left toggle and inflated the rest of the life vest that contained most of the neck collar and thus, lots more comfort.

Now, where was the raft? Because I hadn't seen either the raft or its shadow on the way down, I assumed it hadn't inflated but

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it must be on the water nearby. I couldn't turn around very well because of my stiff neck. I soon saw the raft about 15ft away out of the corner of my eye. I remembered rafts being yellow, but this one was black and at first glance seemed partially inflated. Both illusions were caused by the protective cover draped over the raft's side. I pulled on the lanyard and pulled the vessel to me.

Now the fun began. The time had come to board the raft, I remembered the 'method' from earlier days in water survival training: "Face the low end of the raft, grab the sides, pull it toward you, do a snap roll, and you'll be in a nice, comfortable position on your back." Right. But this approach didn't consider that the person boarding the raft still had his seat pan strapped to his butt. The outcome of this trick was an inverted raft parked on top of my head. I flipped the raft and rested.

Soon I hoisted myself into the raft on my stomach, rested, then tried to complete a sneaky slow-roll. After about 45° of roll, I became hung up on something. My oxygen hose was still connected to the seat pan. I fumbled around and eventually freed the hose, disconnected the pan, and very carefully pushed it to the foot of the raft - I certainly didn't need to puncture it now. About now, my tired and befuddled mind decided to take stock of the situation and sort out priorities.

Where's Tank? I figured he was behind me because he yelled from that direction a few minutes ago. I had replied by waving my arms, I was too weak to do much else after flailing about, and I was nauseous from swallowing sea water.

I turned on my Guard channel beeper, mainly to see if it would work. Half the world knew where we were, probably including the Soviets who regularly shadowed Pacific Missile Range operations with trawlers offshore. Planes had been flying

around us when we ejected: two F-4s (Bloodhound 21, an S-2 used by PMR for range clearance. We also carried a PRC-90 survival radio, so I stowed the Guard beeper and pulled out the PRC, connected the earphone plug to the plug on my hard hat (this was probably the most coherent thing I'd done since leaving the airplane), turned to Guard transmit/receive, and held a short confab with Tank. We were both fine. We were the only people talking on Guard, so I attempted to raise someone on Plead Control, PMR's main range-control frequency. Success. Bloodhound 21 flew low overhead, and we began conversing. Where was the cavalry? It was about 10 minutes away, in two helicopters.

Relieved, I tried to get comfortable. I first sighted the helo as he passed the foot of my raft several hundred yards away, and headed for the wreckage. Almost in unison, both Bloodhound 21 and I let him know neither Tank nor I were at the wreckage. "I'm at your nine o'clock," I vectored him to me over the radio. (I was really at his three - another good argument for giving direction first, then clock code.)

He quickly locked on. "You don't need a smoke." I was happy to hear that. If lighting a flare followed the trend of my misadventures of the past hour, I probably would have doused myself in orange smoke, or opened the wrong end and burned myself.

"Do you have any difficulty?" asked the helo pilot. "I'm hung up on something in the raft," I said. "I'll drop a swimmer," he yelled.

After about 30 seconds, the swimmer splashed down about five yards away, disconnected me from whatever had me hung up, then guided me toward the horse collar being lowered by the second crewman. Using sign language, he told me to get out of the raft. Hesitant to leave the security of my new-found home, I somewhat reluctantly obeyed. Strange thoughts race through the mind at times. I got into the horse collar the right way on the first attempt (getting in the wrong way is probably the most common mistake in rescues). As I came abreast of the helo's door, the crewman grabbed me and pulled me in. I let him do everything his way. At this point, I wasn't about to insert my own inputs, the wisdom of which I had begun to suspect not long after entering the water nearly an hour earlier.

I saw the other helo getting close to Tank, who had a flare in his hand that was billowing immense clouds of orange smoke. I walked forward in the aircraft and watched as the crewman hoisted the swimmer aboard. Both helped me out of my flight gear, then I strapped myself onto the canvas bench, looked out of the open door at the sight of the ocean below me, and smoked one of several cigarettes offered by the crew as we flew off.

One tenet of the fighter pilot's creed is: 'I would rather die than look bad.' You have to look cool as you dismount, just as though nothing had happened, kind of John Wayne-like. Yeah, right! As I stepped down from the helicopter and my feet hit the ground, I began to shiver uncontrollably, and I had great difficulty talking. The thermal shock from flailing around in the 60° ocean for almost an hour had hit. This embarrassing state didn't wear off until later in sick bay, after I had belted down four large, raw brandies.

That evening, Tank and I had our Grumman bowling league scheduled. We went. Luckily, neither of us dropped a ball. ■

Purvis's story



Pete Purvis was born on December 1, 1934 in Cleveland, Ohio, where his first exposure to aviation came while sitting atop

the family's 1937 Ford watching the Cleveland Air Races. After leaving high school he spent four years at the US Naval Academy, where he encountered his first Grumman aircraft.

Purvis flew his first Grumman aircraft, an S2F-1 Tracker, while assigned to VS-32 at NAS Quonset Point, Rhode Island. He soon decided that there was more to flying than chugging along at 100ft, and was eventually selected to attend the US Navy Test Pilot School where he was

assigned to the Service Test Division. One of his most interesting projects was the Skyhook Covert Aerial Retriever System invented by Robert Fulton, who was a direct descendant of the steamboat inventor. He achieved several firsts for Skyhook, including the first live pick-up at night, and the first snatch of two people simultaneously. After three years at NATC, Purvis resigned his commission in 1968 to join Westinghouse in Baltimore as an engineering test pilot. Grumman called in 1971 and offered him the opportunity to become an F-14 experimental test pilot. By early 1975, flight test activity at Point Mugu had waned, so Purvis joined Grumman International as director of Washington operations, and in 1981 he became affiliated with Tracor Aerospace.