



45,000' Delta Dart Endurance

By: M. Ross Shulmister

July 24, 2001

The F-106 was the best-designed fighter of its time. It was sleek, stable, and powerful. But it also had more endurance than any of its contemporaries. Just how much is demonstrated in this story.

It was the summer of 1970, and the 27th F.I.S. Fighting Falcons had been selected to fly competition at Tyndall AFB, Florida. The top guns of the squadron (majors and above, of course) all headed for Tyndall at the end of July, ready to take on 104's and anything else the exercise could throw at them.

The squadron's only bachelor (me, a captain) was selected to remain behind.

But maintenance is never a sure thing, and the competition team needed another bird. None of the married guys wanted to ferry a bird from Loring to Tyndall, so they volunteered the bachelor: "He won't care." (They were right, I didn't care.)

And so, on the afternoon of 30 July 1970, I loaded my littlest travel bag and hopped into a Cadillac of a fighter, the Delta Dart.

Loring was quiet. The B-52s were all snug in their alert chocks, the alert F-106's were waiting quietly in the alert hanger, and no one else was flying. I started my engine, and was immediately cleared for takeoff. The 27th was located at the end of the runway anyway, so there was no significant taxiing.

Tyndall is approximately 3 hours from Loring (by 106, that is). The F-106, with external tanks, had (according to the Dash one) an endurance of 3:15, plus 5 minutes for taxiing, so 15 minutes was an adequate reserve. The '6 could fly a few minutes longer, but regs required shutting down with at least 600 pounds of fuel, so 3:20 was "it".

I have always been one to test the edges of a plane's performance, and so, when other pilots were content to do their cross-countries at 39,000 or 41,000 feet, I preferred to ease the bird up to 43,000 feet. The problem with flying any airplane

at that altitude is that you start bumping into the "sound barrier" at lower and lower indicated air speeds. You may be flying at the same true airspeed as at lower altitudes, but your indicated airspeed gets lower and lower as you get higher and higher. Lift is related to indicated airspeed, and maximum lift over drag (max L/D) is based on indicated airspeed. When you reach the altitude where the speed of sound is down around 170 knots or so of indicated airspeed, you just can't maintain speed without engaging the afterburner.

Flying at Max L/D also requires constant attention, to make sure you don't slow below that speed (it's called getting behind the power curve - it takes more energy to fly slower), and that can tend to annoy a pilot who has other things on his mind. But I really didn't have anything else on my mind so it was no big deal.

I took off and was cleared to 41,000 feet. I climbed to 39,000 at best rate of climb, and continued at Max L/D speed with just enough extra power to have a little climb.

Most airlines cruise at 37,000 and 39,000. I asked for clearance to 43,000. Air Traffic Control didn't care. No one flies at 43,000 except SR-71s, U-2s, and flying saucers, and most of those fly only around Nevada and Roswell, NM. As the 106 burns off fuel, it is able to cruise-climb to a higher altitude without afterburner assistance. As I burned off fuel, I eased the bird higher and higher. ATC chuckled as they cleared to fly at any altitude above 41,000. The controller showed a little disbelief when I reported passing 45,000. Actually I only made it about 100 feet or so above 45,000, but it was enough to impress the civilian down below.

Another thing about the J-75, the higher it gets, the less fuel it burns. I suppose that's partly because there's less drag at the lower indicated airspeeds that come with those high altitudes, but the net result is that you get the same true airspeed as at low altitudes, but with a dramatic increase in fuel economy.

Anyway, I found myself at Tyndall about 3 hours from Loring, and at 45,000 feet, and a surprising surplus of fuel on board. Nothing like a little extra flying time. I requested clearance to Memphis TACAN and back, at 45,000 feet, of course, and ATC had no problem with that.

Coming back from Memphis, I asked for an en route descent - always a great way to fly with very little fuel consumption, and from 45,000 feet - that's a L-O-N-G glide!

Down below, the flying was over for the day. There was no one in the Panama City skies, and the weather was purr-fect. I did a few gentle 360s to buy more time with a minimum loss of altitude. Takes a really long time to descend from 45,000 feet.

Meanwhile, someone down below was not a happy camper. I was overdue with more than 3:20 of flight time, and the Ops Officer wanted to know why I was not on the ground. Ops advised him I was on approach.

It was a lazy scenic approach, with the Gulf of Mexico on my left. As I neared the runway, it was power up, speed brakes out, gear down, easy descent (with a light fuel load - almost none - the '6 handled like it had helium in the tanks), grease it on, pop the chute, use enough brakes to stop at the intersection, and note the flight time - 3:35. Add 5 minutes for taxiing, and that's 3:40. Add THAT to the performance boundary.

As I taxied to the ramp, my fuel low level warning lights came on. No big surprise there. As long as they weren't on when I touched down, I would be okay.

As I shut down the engine, the crew chief advised me I was to report to the Ops Officer (I was one of his "favorite" people).

"You're in deep [whatever-that-brown-stuff-is]," he said. "Your low level fuel lights are on."

"Yes, sir, they came on while I was taxiing in."

"How much time did you log?"

"3:40," I said.

"You're in deep [you know]. You stay right here until maintenance calls me with how much fuel you had left."

A few minutes later, Maintenance called and reported I had a little over 600 pounds remaining.

The Ops Officer was pi...ed, but I think it was not because I demonstrated the capability of the Delta Dart, but rather because he had no grounds to hang me :).

So, it has been demonstrated that the F-106 had more endurance than any other contemporary operational fighter.

And for those of you who never got to ride in a '6, you can experience the same feel of a cross country flight F-106 by putting on a crash helmet and a face mask, and riding down the turnpike in a brand new Cadillac, with your seat belt on.

LtCol M. Ross Shulmister
USAF Retired

P.S. The 27th lost the competition. According to the stories I heard when the major top guns and lieutenant colonel top guns returned to Loring, they lost because the F-104's didn't play fair - they kept fighting vertically instead of horizontally.

P.P.S. I understand that there were no F-104's at the 1970 William Tell - I don't know when else that some of the competitors from the 27th put the blame on F-104's, so there is an inconsistency in my story that I cannot reconcile. The story is, however, true. Since I wasn't selected to participate in the 1970 William Tell, I would not have known which birds and which squadrons were involved.