The F-111 in Linebacker I and II

In August 1971, I was assigned – not willingly – to the 474th TFW flying the F-111A (a.k.a McNamara's folly) at Nellis AFB, Nevada. I say 'not willingly' because I was previously flying the F-100D "Super Sabre" and had done a one year tour in Southeast Asia from November 1969 – October 1970. No single seat aviator wants to go to a dual place aircraft, especially one where you sit side-by-side (this arrangement was courtesy of the US Navy before they dumped the F-111.) A tandem seating arrangement would have made it impossible to use the aircraft carrier's elevators as the aircraft would have been too long.

The transition to the F-111, or Aardvark as it was commonly known, was uneventful. However, many things about the jet and training program left one with the sense that the full capability of the aircraft was not being realized. I personally did not like the side-by-side seating arrangement because it was difficult for the pilot – commonly called the aircraft commander – to see anything from his 3 o'clock to 6 o'clock position. The right seater, usually a navigator, had to operate the attack radar so his focus was usually heads down in the scope. The navigator also controlled the armament control panel on his side of the cockpit. The pilot only controlled the Master Arm switch. I am 99% certain this arrangement was for the delivery of nuclear weapons. It would take specific actions by two crewmembers to arm and release a weapon.

Unlike other Air Force fighters, there were no ejection seats in the Aaardvark. Instead, the entire crew compartment, or capsule, would separate from the aircraft once an ejection handle was activated and the pyrotechnics fired properly. Before my squadron deployed to Southeast Asia, the wing lost an F-111 and two crewmembers were killed because the pyrotechnics (think of these as a fuze that enabled the crew capsule to separate) failed to function. Our F-111s were grounded for about a month until a fix was identified and all the aircraft were inspected. I never did fully trust the ejection system. Thankfully, I never had the occasion to pull the handle for a nylon letdown.

The F-111 was a variable swept wing, all weather, supersonic aircraft equipped with both an attack radar and terrain following radars (TFR). TFR is a technology that allows very low flying aircraft to maintain a relatively constant altitude above ground level. The F-111 employed two TFR radars in its elongated nose as well as the larger attack radar dish. Each TFR system was "stand alone" such that if one failed the pilot could select the second system. Prior to deploying for Linebacker, we never flew TFR in the weather during stateside training sorties. Additionally, the primary means of weapons delivery was either straight and level or "toss bomb" using the analog computer. The aircraft was capable of dive bombing but we never trained for that mission.

The F-111's radar was optimized for ground attack. The radar was useless for detecting any air-to-air threats. The attack radar served two primary functions on combat sorties. First, we used it to update the INS prior to crossing into North Vietnam because the INS had a tendency to drift thereby degrading subsequent target acquisition. Second, during the actual bomb run the right seater would use the radar to locate the offset aiming point so the weapons release computer would provide steering information to the actual target.

What the F-111 could do best was go fast at low level to fly underneath enemy radars thereby minimizing detection from an integrated air defense system. The flight control system had been optimized for this flight regime and worked very well. The aircraft was rock solid at 200 feet AGL and 500 KCAS. The downside was the F-111 community did not have conventional weapons to take advantage of this unique capability. For example, if the aircrew selected the minimum release setting of 125 milliseconds between MK-82 500 lb high drag munitions alternating from each side of the aircraft, there would be a 'gap' between the effective frag patterns once the bombs hit the ground and exploded.

I mentioned earlier that the F-111 pilot could sweep the wings from 16 degrees – normal for takeoff – to full aft at 72 degrees. There are plusses and minuses for each setting. Certainly using the forward setting, 16 degrees, provides the most lift for takeoff. After takeoff and at altitude, most pilots would place the wings aft to 26 degrees for cruise. Starting the descent to TFR altitudes, the pilot would sweep the wings further aft for the high speed target run. There was, however, a huge difference once the wings were swept aft of 45 degrees. At 45 degrees and further aft the flight controls – ailerons and rudder – were limited. This meant that the pilot could not aggressively maneuver the jet should the need arise to avoid AAA or SAMs. I'm confident that most pilots used a wing sweep setting that did not limit flight control effectiveness while still retaining the ability to go as fast as possible.

The aircraft design incorporated 4 pylons that pivoted with the wing sweep. Two pylons on each side closest to the fuselage possessed this functionality. When we carried the standard load of 12 MK-82 high drag bombs, two pylons would have a BRU-3/A rack attached. (BRU stands for bomb release unit.) For the high altitude missions in Laos, we'd carry 24 MK-82 'slick' bombs using 4 BRU-3/A racks. Each BRU-3/A rack could carry six 500 lb bombs. We carried an ECM pod on the fuselage centerline. The 474th had many problems with the BRU-3/A racks and the armament control system. There were incidents where pilots depressed the pickle button and the racks AND bombs separated together from the aircraft. Dropping "duds" in RP-6 does not endear the aircrew to the F-111 system. This issue should have been identified and solved during rigorous stateside training.

In September 1972, the 474th TFW received orders to deploy to Thailand to relieve the 49th TFW equipped with F-4Ds. The 49th needed to return to Holloman AFB and prepare for a Crested Cap deployment to Europe. The 429th and 430th fighter squadrons were selected to deploy while the 428th remained at Nellis AFB. My squadron, the 429th TFS, was first out of the chute with 12 F-111s. The route of flight was from Nellis to Guam to Takhli RTAB, Thailand. The wing had sent a few experienced crews to Takhli

to prepare for combat operations. I was one of 12 aircrews that pre-positioned at Guam so when the F-111s arrived and were refueled we launched for Takhli. After a 6+ hour flight from Guam, the first six Aardvarks arrived in country for combat operations slated to begin that very night.

Unfortunately, the 430th TFS lost a jet, # 7078, and crew the very first night, 28 September 1972. Ranger 23 took off heading for North Vietnam and never returned. The mission planning was not adequate because the F-111 flying at night absolutely depended upon mensurated data and accurate radar predications. Those critical elements were lacking as the F-4Ds had little use for them. The left seater had been on the Combat Lancer deployment in the late 1960s when three of six deployed F-111s were lost. There were many dejected aircrews after this loss on the first night. What happened? Was it a system failure or operator error? A safety stand down was necessary to get our kit in one bag before again heading north. Much later, a review of all data associated with this flight determined Ranger 23 most likely descended into heavy rain, experienced "scope blanking" – a phenomenon no one had ever experienced, and flew into mountainous terrain. (The following paragraph discusses "scope blanking".)

As more F-111s and personnel arrived in Thailand, the wing instituted a local flying schedule to acclimate aircrews and planes to the new environment vastly different from the dry Nevada desert. What we found was very unsettling because of the potentially deadly impact it had on the TFR system and by extension, the aircrew. The large water droplets associated with Monsoon weather patterns in Southeast Asia attenuated the TFR radar! The way the automatic TFR system worked needs a bit of explanation. The pilot could set a clearance plane above the terrain of 200, 300, 400, 500, 750 or 1000 feet. He could also select a soft, medium or hard ride. Generally, almost everyone I knew used the medium ride setting. The system also incorporated a Low Altitude Radar Altimeter (LARA) that looked straight down. When flying on auto TF over a desert, a lake, an ocean, or dry lakebed there would not be any terrain for the radar to detect, e.g., there would be no radar returns. The system would then use the LARA for the set clearance plane. In the F-111A that we were flying, auto TF only guaranteed terrain safe separation for bank angles not exceeding 10 degrees. In addition, the navigator only had the ability to load or use one radar offset location. Later during our deployment, we received an urgent fix allowing up to six pre-planned offsets to be loaded prior to takeoff. Finally yet importantly, the pilot had an E-scope that went out to 10 miles that conveyed key information as to the operation of the TFR system. The E-scope displayed a solid line representing the set clearance plane. As long as there were returns on the E-scope underneath the set clearance plane line, the pilot knew the TFR system was detecting mountainous terrain. However, if the scope started going blank at 10 miles working back to 0 miles, one of two things was happening. First, the auto TF system was going into LARA override because the F-111 was soon to overfly a flat surface. This was not very likely unless you were egressing "feet wet" over the ocean after hitting a target. Second and more deadly in the mountains and karst formations of Laos and western North Vietnam, the aircraft was most likely flying through a heavy downpour and the large water droplets were attenuating the TFR's radar energy! Not good. If the pilot did not notice this occurrence and take action by climbing to a minimum enroute altitude the system would default to LARA override and the chance of hitting a solid rock mountain increased exponentially. For the pilot, situational awareness was paramount. Hitting the ground or a mountain would ruin your day. All of us learned to have a no kidding MEA memorized for our route of flight.

After the stand down, the 474th returned to combat operations October 5th.

Our sister squadron, the 430th TFS, almost lost a jet during a RP-6 sortie October 12th. The North Vietnamese fired four SAMs that missed but scared the hell out of the aircrew. With only SA-2s and SA-3s, the likelihood, or probability, of a SAM hitting an F-111 flying TFR was low. However, any SAM firing definitely garnered your full attention. A few days later, my squadron --the 429th --suffered our first loss and the second for the Wing.

The 429th TFS lost a jet and aircrew on October 16th. The frag order specified four MK-84 2000 lb 'slick' bombs for a target west of Thud Ridge and fairly close to Hanoi. The pilot had very few hours in the F-111 as he had previously been an ATC instructor pilot before being assigned to the 474th TFW. Making a "toss bomb" delivery at night in a high threat AAA and SAM environment is no piece of cake even for an experienced aviator. The pilot and navigator planned to ingress from the northwest at low level and high speed. Once the navigator had locked onto the radar-offset point, the pilot would de-activate the TF system, depress the pickle (bomb release) button, and begin a climb following the steering bars to the target until the computer released the bombs. Now the problems begin …. how to get back to low altitude and engage the auto TF system and get out of the high threat environment? The aircraft is now at a relatively high altitude where North Vietnamese radars can track it and pass information to the shooters – either AAA or SAMs. We'll never know for certain what transpired; however, the North Vietnamese stated the very next day that they had shot down an F-111. Both officers were married – a tragic loss. After this combat loss the 474th was never again fragged for any weapons in Route Pack 5 or 6 other than 12 MK-82 high drag 500 lb bombs.

F-111 tactics and procedures. After the loss of Ranger 23 on the first night, each aircrew had to leave a map with the mission-planning cell depicting route of flight and navigation turn points. We also had to name each turn point and then attempt to call Moonbeam, a C-130 command and control aircraft, upon our arrival at each point. The F-111 had both a UHF and HF radio. We preferred to use the HF for these reports such that the UHF would remain on strike frequency. This was a pain in the ass, especially in RP-6. Aircrews also learned rather quickly that the bad guys could see the explosive carts firing the ejector plungers to propel the bombs off the BRU-3/A racks. They would then point their AAA salvos ahead of the aircraft's expected flight path – think of a shotgun hunter trying to hit a pheasant. You shoot where the bird is expected to be based on the time of flight of the shot versus

where he is now. Our procedure, especially in the flat delta in RP-6, was to paddle off the auto TF and aggressively bank the jet in order to change the aircraft's flight vector by 30 -45 degrees. Never be predictable if you have an option.

In late October Henry Kissinger and Le Duc Tho were close to a negotiated settlement so combat sorties to RP-5 and 6 were curtailed. Our combat sorties in North Vietnam were all south of the 20th Parallel in RP-1. Additionally, the 474th flew high altitude missions over Laos carrying 24 MK-82 "slick" bombs or 16 CBUs (cluster bomb units where a radar fuze opens the clamshell at a specified altitude above the ground and small fragmentary bomblets are released over a wide area) using a technique known as beacon bombing. In beacon bombing, a ground transmitter placed by "friendlies" emitted a frequency compatible with our attack radar. Once the beacon was acquired, the navigator would put in the range and bearing to the target. After that occurred, it was simply a matter of the pilot following the cockpit steering bars until the weapons computer released the bombs. These high altitude sorties over Laos were vastly different – and less stressful -- than flying into North Vietnam. The higher threat sorties to RP-1 allowed an egress over the Gulf of Tonkin after striking the target. So as not to have the US Navy become agitated at an unknown bogey approaching their ships high speed at night, the crew first 'squawked' using the IFF, turned on the aircraft external lights and made a call to Red Crown, the Navy's controlling agency Getting hosed by friendly fire was not a good way to end the sortie.

The night of November 6th, the 430th lost another F-111 and crew in RP-1. This was the wing's third loss. Of note, this was the eve of the Presidential elections in the United States so units were urged to conduct a max bombing effort. Typhoon Pamela was situated off the Vietnamese coast so weather was terrible. I flew that same evening and could not get to my assigned target in RP-1 as the E-scope kept blanking out due to the TFR's energy being attenuated by the heavy rains. I dumped my bombs on a secondary target – most likely Mu Gia Pass – from a high altitude.

Thirteen days later, November 19th, the 430th TFS lost another jet and aircrew on a mission to RP-1. This was number four. Then on December 1st, pieces of the wreckage washed ashore about 30 miles north of DaNang in South Vietnam. Subsequent investigation of the wreckage showed the wings were swept all the way aft to 72 degrees. Before this loss, aircraft # 092 had been written up by aircrews that the LARA was not working as advertised! Reportedly, a few days prior to the accident, another 430th crew went "feet wet" and when they turned on the exterior lights discovered the F-111 was less than 100 feet above the ocean when the LARA said they were at 500 feet. YGBSM!! There is no indication to the crew that the LARA has failed internally. The best guess based on investigation of the wreckage is that the aircraft flew into the ocean and was destroyed.

BACK TO THE PACK, December 18th 1972! President Nixon has had it with the North Vietnamese slow-rolling negotiations. All 474th aircrews attended a mass briefing where new, less restrictive rules of engagement (ROE) were outlined. Targets previously off limits such as those within 10 miles of downtown Hanoi were now on the Air Tasking Order, or frag. As this was to be a maximum effort, no search and rescue (SAR) missions were contemplated for the first three days. The missions assigned to the F-111s were to support the B-52 strikes. Yes, the Buffs were at last going to hit targets in North Vietnam. The 474th sorties were to hit known GCI and SAM sites 15-20 minutes prior to the B-52s first time on target (ToT) – hopefully to reduce the Buffs' losses.

The integrated air defenses over North Vietnam took a heavy toll on the Air Force. The night of December 19th the 430th TFS lost a jet and aircrew – number five. A B-52 was also lost that same evening. The spirit of Christmas was **not** in the air. Instead, it was very heavy AAA, multiple SAMs and MiGs.

December 20th is the night I darned near bought the farm. My target was Kep Airfield along the northeast railroad leading to China. Recce photos depicting bomb damage assessment showed the runway was still in use. The special instructions prevented me from egressing feet wet after dropping my bombs. That would have been my preferred route as it was the shorter distance to safety. Evidently, the US Navy was not interested in seeing other than their own aircraft approaching the carriers at high speed.

Here's a short synopsis of that night. Because of our internal fuel load, there was no need for either pre or post-flight aerial refueling. I stayed at a medium altitude until starting a gradual letdown over Laos. All aircraft systems were a "go." As we normally did approaching the border, my navigator and I selected the weapons and release intervals before I selected Master Arm "on." The North Vietnamese GCI radar sites were detecting me and other F-111s as we made our way to assigned targets. The 'chatter' on UHF guard became intense approaching North Vietnam. Teaball was calling out bandits, e.g., MiGs, and I could see in the distance lots of AAA and a few SAMs rising into the night sky. When the B-52s were within range, you'd often see four or more SAMs fired at the approaching heavies. Once in North Vietnam airspace I had descended down to 200 feet AGL and flying 500 KCAS plus. My flight path took me north of Thud Ridge toward Kep Airfield and the northeast rail line extending into China. Approaching Kep I climbed to 500 feet AGL and slowed down (did not want to but the restriction on the MK-82 fins was ~ 480 KCAS) until bomb release. When all 12 bombs were on their way to the target, I changed heading more than 30 degrees – the auto TF was intentionally paddled OFF – pushed the throttles up and started a descent over the rugged terrain to 300 feet AGL where I engaged the auto TF. Unable to egress over the Gulf of Tonkin, I turned around and headed back over the northeast railroad. Approaching the gap in the mountains where the railroad was located, all hell broke loose. The RHAW gear was screaming at me, 23 and 37 mm AAA was too damned accurate and Teaball was calling out blue bandits (comment: a blue bandit meant it was a MiG 21). I instinctively banked the jet to the right, flying closer to the Chinese border hoping for a little less AAA – to heck with the buffer zone restriction along the Vietnamese / Chinese border. How the gunners missed us is still a mystery but one I'm thankful for. Turning northwest and now down to 200 feet AGL across the relatively flat terrain, Teaball was calling out blue bandits in reference to "Bullseye", downtown Hanoi. I thought we were in close proximity and sure enough, a short time later I saw the exterior lights of two MiG-21s about 7,000 -10,000 feet above us going in the opposite direction. Finally, on my way back to Thailand, I saw a B-52,

Orange 03, hit by a SAM followed by a tremendous fireball. My personal records are sketchy but I believe the Air Force lost six B-52s this night. In retrospect, having the Buffs fly predictable paths to their targets using "bomber stream" tactics with elements approximately 10 miles in trail was not tactically sound. Once the B-52s had dropped their bombs and made a turn off target, their ECM coverage became degraded thereby providing SAM operators the ability to track targets. Shortly thereafter, B-52 tactics were changed significantly.

The sixth and last F-111 lost is a relatively good news story as both the pilot and PWSO came home as POWs (comment: PWSO stands for pilot weapons system operator; the Air Force put recent UPT graduates into the right seat much to their chagrin). On December 22nd, Captain Rob Sponeybarger and 1st Lt Bill Wilson, 429th TFS were fragged 30 minutes in front of me on the Bac Mai railroad depot southwest of Hanoi. My target was the Gia Thong storage area just north of Gia Lam airfield northeast of downtown Hanoi. Sponey made a call that his jet was hit and he was shutting down one engine. He nursed the Aardvark to the rugged terrain west of Hanoi where they ejected because the spreading fire had caused the flight controls to become "mushy." The capsule worked! Once on the ground, Sponey and Bill decided to separate in order to increase their survival chances. Sponey was captured Christmas Eve and Bill made it to New Year's Day before the North Vietnamese located him. In fact, an A-7D dropped Bill a survival pod filled with supplies on December 31st.

President Nixon called a bombing halt December 30th for the areas around Hanoi and Haiphong Harbor. Peace talks were scheduled to resume January 8, 1973 in Paris. A newspaper clip I still have states that from 18 – 30 December 1972, the duration of Linebacker II, the US Air Force lost 27 aircraft including 15 B-52s. Ninety-three airmen were killed, captured or missing in this maximum effort operation.

January 8, 1973. Crews from the 428th TFS arrive and the 429th aircrews start heading home. For the 430th TFS jocks this is great news for their 179 day TDY deployment has turned into a PCS assignment so they'll earn credit for a short tour. For the 429th, we'll go home for a short rest and most of us will return so the 430th can return to CONUS.

Summary:

The final scorecard for Linebacker I and II shows the 474th paid a high price during combat operations. We lost six F-111s and five crews (10 officers). The 430th TFS lost four jets and four crews while the 429th lost two jets and one crew. I'll leave it to historians to judge airpower's effectiveness in Southeast Asia. If asked, my inputs would focus on two areas. First, train in peacetime the way you intend to fight in combat. Wring out systems and weapons before heading to war. This was not done in the F-111 community and we paid the price in losses, inadequate weapons as well as system inadequacies. Second, gradual escalation to "give peace a chance" is a sham. We lost too many aircraft and aviators either killed or captured during many years of 'going downtown', e.g., into North Vietnam, and bombing pauses. Only the massive bombing during Linebacker II convinced the North Vietnamese to return to the bargaining table. As a very senior officer so aptly stated, "Once Air Power was allowed to do its thing, we kicked their butts."