



Mirage Enthusiasts Blogs



One Team For Life

Blog 2. Mirage Modifications.

20 Oct 23. Richard Bomball: Radar Navigation

Firstly, the Mirage was not the only bird to be airbrushed. As I recall, little or nothing was said of the Sabre presence at Butterworth in 1959/60 in the last two years of the Emergency.

But moving on to the Mirage, I did the 4th Course and stayed on at OCU. In the last half of 1966 I was sent to the Nellis to do an 80 hour F105 Short Course to learn the rudiments of radar navigation in preparation for our acquisition of the Cyrano 11B radar and introduction of the ground attack Mirage course. This was at the height of the Vietnam war and the Americans had no idea why I had come, hoping I was going on staff as an exchange officer. Because of their limited role in the Rolling Thunder campaign in Vietnam, ie, bombing the living daylights out of the North, flying in heavily escorted packages, they had deleted the radnav flying serials from the course but, fortunately, had retained the ground school. So I very quickly contacted our air attache in Washington who negotiated three or four radnav rides for me.

When I came home and flew the Mirage with the 11B radar, two things immediately became obvious: firstly, the 11B radar was a miniaturised replica of the F105 radar – so the French had engaged in some very efficient industrial espionage; secondly, for some very odd reason, the French had modified out of the 11B radar the two capabilities essential for radnav, viz pilot control of the gain and of the antenna elevation! Gain was set at maximum and the antenna was set at a fixed slightly downward angle. I assume these changes were to prevent dumb pilots from flying into hills with the gain turned right down or the antenna set full up. Admirable aims perhaps, but effectively rendering radnav almost impossible.

Fortunately, two French techreps were at Williamtown. So I had an urgent discussion with them to see if it was feasible to re-programme these capabilities back into the system. The gain wheel on the radar control stick would give infinite control but we needed to decide on values for antenna up/down control buttons. I can't remember the exact values but I proposed something like a ¼ degree per blip up to about 1 ½ degrees and down to 1 ½ degrees. Anyway, the guess turned out perfectly. At the end of the discussion, in his thick French accent, the senior rep asked "Monsieur Bomball when would you like to fly it?" In answer to my 'as-soon-as' response he floored me by saying I could have it by 1130 that morning!

I scheduled a mission for 1130 and armed with a re-programmed control box off I went. To cut a long story short, it worked like a charm and, following the mandatory modification paperwork, that was the way the Mirage flew to the end of its life.

My second and final tale relates more to the basics of radnav. In this day and age of GPS and digitised moving map displays, today's jocks would be horrified at what we dealt with back in the '60s. We bought the Mirage without the Inertial Platform to support the Position Homing Indicator system. As a consequence its precession rate rendered it next to useless very quickly. Hence Jimmy Treadwell's colourful translation of the PHI acronym as the Pure Horseshit Indicator! If that wasn't



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enough, many of you will recall the old concertina flip maps we laboriously prepared that always seemed to have the key features at the next fold in the map. I had found in the F105 that trying to juggle the flip map, interpret the screen, keep track of time and not fly into a hill etc was next to impossible. There had to be a better way! Fortunately, somewhere in my distant past I had learnt how to heat treat Perspex and, after a lot of thought, it occurred to me that it might be possible to create a knee pad with an etched representation of the radar screen at the correct scale, rollers at the front and back to take a continuous route map, and we could kiss the flip map goodbye. Over a weekend I created a prototype, drew up a route map and flew it the next Monday. I really liked it and gave to Andy Patten, the USAF exchange officer to try. He came back totally convinced. Many year later he credited me with inventing the first moving map display. A bit of a stretch but nice to hear anyway. We gave the prototype to 478 Sqn to produce sufficient models to support the first course and that was that. Over the life of the Mirage the knee pad evolved and finally became a lit version the clipped to the gunsight but the system stood the test of time.

To conclude, in early 1990, in between leaving the Chief of Development post (about to be centralised into Defence) and taking over the Defence Academy, for my sins I was tasked to lead the Mirage Sales team which successfully sold the remaining 50 to Pakistan. A bitter-sweet achievement!! Don't hold your collective breaths, but I am attempting to write an account of that final episode and put it into book form to complete the final, final chapter in the Mirage story.

Footnotes:

1. from Doug Riding:

Dick is too modest to include a footnote to his recall of his Thud Short Course, and that is he topped the course and won the weapons prize for all weapons delivery modes.

Cheers Dick, and thanks for the record of radnav in the Mirage, unquestionably the most challenging role for great multi-role fighter

2. from John Quaife:

Good to read Dick!

Despite the conspiracy theories, I know the current RAAF Historian would welcome your manuscript of the final, final chapter when completed.

Noting Doug's comments I'm wondering if you were also dux of the first local F/A-18 advanced course?

I didn't make the claim, but did recognise your contribution in 'the CLASSIC – F/A-18 A&B Aircraft in Australian Service'. Being an old Mirage pilot myself, the book includes more than the occasional reference to the real-man's aircraft that preceded it.

3. From Ian Burke:

I think you will find the term "Pure horse shit indicator" was first used by Brick Bradford around '65-66.

Mike Tardent: 22 Oct 23: Modifications to the Lady

I have a couple of anecdotes that may be of interest. They both involve illegal modifications to the Lady.



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In 1984, realising that we had only a few aircraft left that could still carry and fire the AIM9B, (most of our fleet had R550 mods then), and knowing the Hornet was imminent, I wrote to their lordships requesting release of our war reserves of R530 and AIM 9B missiles for our training and enjoyment.

Well, I didn't actually use the enjoyment word, maybe morale or something. To my surprise, this was granted. We promptly planned a quicky point defence adex at WLM which involved Canberra and Caribou aircraft. The aim was to launch a fully loaded air defence Mirage to fire an R530, two AIM 9B's and a full gunpack at the appropriate targets. The sorties were launched from the ORP under 3CARU instructions. As XO, I had decided that the batting order was in reverse seniority, so the boggies got to shoot first and the more senior guys got to shoot what was left. A morning of great anticipation and excitement. The first four sorties resulted in aborts, no fire, no nothing, so we stopped the program. A quick tech investigation revealed that the missile prep switch circuit had fused.

In the history of the Mirage we had never carried a full warload of missiles. Only an R550 radar head and an AIM 9B seeker head in training sorties. When we fired a missile, it was one or the other never, both and certainly not three! The simple fact was the missile electrical circuit was never fused to allow the R550 and the Sidewinders to run both the seeker heads and the associated heating requirements of the weapons. Our troops were brilliant in their rapid assessment of the problem and allowed me to say to our Sengo, "stick an effing nail in there, we cannot lose this opportunity". So it happened, and a bunch of happy pilots had probably the best sortie of their Mirage career! The downside was the realisation that we had fired our total war reserve of missiles off in one day! I didn't like night flying in the Mirage. Not an easy aircraft and in my view, crap cockpit lighting. Nowhere near enough sorties to build confidence. My first weekly planning conference in January 1982, Tex Watson asked the question, "any night flying 77? No sir, I said, but as a heads up, at the end of daylight saving, we will fly four nights a week, three waves of 12 aircraft each night for three months until we finish, regardless of the time."

To his everlasting credit, Tex went along with the program and I finished up with the most incredibly competent bunch of guys as this program went on every winter while I was XO.

My gunship experience in Vietnam taught me a few things. At night, in a shallow dive, the pilot flying called "hot" and the pilot not flying armed the master switch and shut his eyes. On completion of firing the pilot flying called "handing over" and the support pilot recovered the aircraft and flew it in the circuit until the shooting pilot recovered some vision.

It seemed to me that executing a front quarter R530 missile attack involving a pitch up to 30 degrees, firing, and then a roll to inverted while experiencing the loss of vision from the missile launch was somewhat problematic. I did extensive research and could not find any anecdotal or other experience of night weapon launches requiring such manoeuvres the R530 required. So, the Huey had beautiful cockpit night lighting, red and white, fully variable and selectable. Back to the hangar, asked the troops can we put different lights into the existing circuits. These blokes are getting used to me now!

We reconfigured the cockpit lighting on an aircraft to a mix of adjustable red and white lighting in the hangar and and threw a blanket over it and let everyone have a look. Bear in mind I now have a pilot body who are doing night aeros for all I know! RJB had a look and I believe, liked it. The protocol for having this mod processed through SUPCOM and then trialled through ARDU would have taken longer than a Mars flight, so I said to Sengo let's just put it out on the line and see what it flies like. We did, and we loved it!



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After more than 2000 hours on this magnificent aircraft I can say I went from intimidated to confident, perhaps almost to mastery, but always with respect!

As a footnote, I must endorse comments here about Dick Bomball, the finest OC I ever served under. A pilot who challenged the weapons board every time he flew, and a great golfer, which for those of you who know, is the supreme measure of a man!

Barry Schulz. 22 Oct 23: UHF Comms

On a similar note – after a coupla thousand hours on the ‘French lady’ and as XO 75 at Butterworth under ‘Beege’ Weston, I was frustrated at the continued acceptance of poor UHF comms; especially, during ACT where more often than not the radios were even worse!

I initiated a mod using the microphone from my ex USAF F4ES days at Nellis FWS – the mics were available in the box-packing inventory. The Radtechs came to the party and not only did the microphone fit our masks neatly, reproduction was as clear as a bell! ATC & boggies alike were questioning why my comms were so clear and theirs were not. The secret was out and 75 Sqn consequently modded all pilot’s masks. So we were enjoying clear crisp comms and the ‘Brick Brigade’ were not!

The cat was out of the bag when ‘Country’ returned to Willy and the illegal Mod was discovered and de-Modded.

I initiated ‘air wars’ with Trudy and our enemy 3 SQN and, to enable friend–foe recognition, got agreement from the Engineers to paint identifying symbols on the wings of our birds. I was thinking a circle, triangle, square etc – the boggies wanted swastikas, Israeli stars, P&Bs etc. Commonsense and authority prevailed! So on a Friday afternoon the paint job was done using an AVTUR-based paint to facilitate removal after the program.. Unfortunately the paint wallas gave less than precise instructions as to the location of the paint and a permanent version was used. Not only did this take time for the markings to be removed but, etched into the surface leaving a ‘watermark’ effect ... oops!

After a successful Air-to-Air programme in which we recorded superiority over the Fighting 3rd, we proved our supremacy by modding their hallowed Mirage tailfin out side the 3 Sqn crew room. We cut cannon holes from the radar reflectors on the banner and superglued them to the tail (I’ve lost the photo which was presented to Bernie Reynolds during the Morning Mass briefing – Brick was less than impressed). We suffered 3 Sqn’s revenge of rotting prawns, black & white chook invasion of our crew room and defacing of our carved Squadron badge – the Magpie’s head was removed “... teeny tiny little thing, got no feathers got nor wings – cut its head off”. So sad!!
Enjoy the memories



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23 Oct 23. Sean Trestrail: Those were the Days

As to your description of the 75Sqn desecration of the 3 Sqn fin you know the rules "No Film no Kill!" typical of the "Black and White Mistrals" cavalier attitude to record keeping you failed to document your feeble attempt to desecrate the Fighting Thirds fin.

The Fast Fighting Third on the other hand with their usual attention to detail fully documented their retaliatory "Wumpy Duck" raid with both pre and post strike imagery some of which is attached. Other images of the chooks running around the crewroom are available on special request however are not published here as they also contain images of the chooks on the "Ukers" board ... now considered not appropriate for modern minds. For the archives I here document in writing the true accurate details of "Operation Wumpy Duck"

The planning of this raid was meticulous. The Arma was provided with 10 Ringgit and asked to procure half a dozen of the mangiest chooks possible from the Butterworth market. Though perplexed why master wanted scungy chooks she obtained some magnificent specimens. Great care was taken in preparation of the new revised 75Sqn crest ... this was important as it would have been ungentlemanly to flog the original crest off the crew room door and not provide a suitable replacement.

And so one Hot Friday night operation "Wumpy duck" commenced. Crest removal from the front door was straight forward and it was immediately spirited away for safekeeping. Then the replacement crest was attached over the bar with precision and delicacy with 6"nails. The command to "Release the chooks" was given the chooks then commenced to fertilize the the 75Sqn crew room carpet and tables then the master stroke.

The cheap foam type ceiling tiles were carefully moved to expose the opening of the faux ceiling pillars. then approximately 1Kg of rotting prawns were deposited in each ceiling pillar. The final phase during the withdrawal was to turn off the Air conditioning to allow the new contents of the crew room to mature over the weekend.

Monday morning was a very memorable occasion for 75.

But there is more.

One 75 Sqn pilot who shall rename nameless but lets say his nickname was of a "Rural" nature took particular offense to 3Sqns magnificent donation of a new Squadron crest. The crest was left outside the confines of the 75Sqn building for 4 days basting in the tropical heat. Thursday night came a dinning in. Said rural member decides to lambast 3Sqn by displaying the now bloated wumpy duck...(now looking more like Mr Creosote) to the members. To add emphasis to his presentation the rural pilot with great speed and rotational force from below the table presented the wumpy duck to the guests. The internal gas pressure of 4 days in the sun had clearly compromised the Wumpy ducks structural integrity as it slowly disemboweled itself in front of the members.... much mirth, merriment and dry reaching ensued.

Footnote. I do acknowledge the aplomb in which 75Sqn carried out their retaliatory response in removing a certain minor artillery piece from 3Sqns custody. Those were the days.