

Ron Haack Wing Commander (rtd)

## BACKGROUND



Grew up on a dairy farm in South East Queensland; matriculated from Gympie State High School in 1968, just shy of 17<sup>th</sup> birthday. Vocational interests were engineering and aviation with aspirations to be an astronaut.

Applied for a Qantas cadetship but unsuccessful, could not afford University so applied for direct entrant aircrew in the Air Force. Initially too young so spent 18 months working on the farm at Miva. Joined the RAAF in April 1970 on No 77 Pilots Course and graduated in July 1971.

Thought progression to Astronaut was through fast jet and test pilot qualifications but was initially posted to fly DC-3 Dakota aircraft (Gooney Bird) at the Aircraft

Research and Development Unit (ARDU), Laverton, Vic. Disappointed but an opportunity to mature and enjoy some great experiences; one epic mission to central Java, Indonesia in Dec 72 just after confrontation. Continued to apply for fighter training every two weeks.

Eventually, posted to Williamstown (Fighter Town – Newcastle) for Mirage 3 fighter training. Operated the Mirage 3 with 75 Squadron in Malaysia/Singapore and 77 Squadron at Williamstown. Continued to apply for test pilot training.

Was posted to the Empire Test Pilot School (ETPS) at Boscombe Down, Wiltshire, England in December 1977; graduated as an experimental test pilot in December 1978. Prince Charles was guest of honour at the graduation.

Spent the next four years conducting certification/qualification flight tests on Mirage 3, F-111, Macchi, Nomad and CT-4 aircraft at ARDU. Staff job in the Tactical Fighter Project Office in support of the F/A-18-Hornet acquisition was followed by a posting to the USA to qualify on the Hornet and certify unique capabilities incorporated in RAAF aircraft.

Back in Australia in 1985, represented McDonnell Douglas and flew the first flights of most RAAF Hornets as they rolled off the assembly line at Avalon, VIC. Joined Aerospace Technologies of Australia (ASTA) to continue F/A-18 production flying. At the time I was also test flying the Nomad Searchmaster and conducting post-maintenance test flights of the Mirage 3.

Eventually, posted back to ARDU supervising fast jet and rotary wing test flying and then to Williamstown as the Operations Manager for the fighter force. Retired from the RAAF in Oct 95 and joined Qantas flying Boeing 747-400 and Airbus A330 aircraft. Continued to conduct civilian certification tests on aircraft such as Cessna Caravan, B-1900, King Air, CASA 212, Diamond 42, Mallard, Cessna Citation and Lear Jet. Operated the Lear Jet in military support and fire scan roles for a short while.

Helped revitalise the Flight Test Society of Australia (FTSA - [www.ftsa.org.au](http://www.ftsa.org.au)) as Secretary. Currently, Treasurer of the Fighter Squadrons Branch of the Air Force Association (AFA), Business Manager AFANSW and Manager *Wings* magazine.

Didn't make astronaut but life has been eventful and rewarding.

### **Highlights of Test Flying**

- TP training – ETPS
- Mirage:
  - ◆ CRV-7 Rockets
  - ◆ Mirage HIPATS Target Towing
- F-111
  - ◆ GBU-10 – Surfing at 100ft at Mach 1.2
  - ◆ F-111 Mk41 Destructor Separation – parachute failures
  - ◆ Mirage/F-111 Karinga Fin Separation and Demonstration
- Certification of RAAF modifications to F/A-18 Hornet:
  - ◆ HF radio performance
  - ◆ EMI/EMC qualification
- USN Hornet:
  - ◆ F/A-18 weapons separation 60° Dive Mach 1.3
  - ◆ Voice Control Interactive Device
  - ◆ USN Engine Accelerated Life Cycle Tests
  - ◆ USN Dynamic Departure
  - ◆ Convair 880 AA Refuelling
- RAAF Hornet:
  - ◆ Production Acceptance Tests - 1<sup>st</sup> Flights
  - ◆ Boeing 707 AA Refuelling Certification
    - ◇ Tullamarine
    - ◇ PC-9 Rendezvous
- CT-4E Spinning
- Nomad Single Engine Climb Performance
- Mallard:
  - ◆ Single Engine Climb Performance
  - ◆ Stalling
  - ◆ Max Energy Stop

## TF/A-18 HORNET DYNAMIC DEPARTURE



This link <https://youtu.be/clsvuEfW6Tc> or the above QR Code is to a video (watch carefully or you will miss it) that records the loss of control of a brand new two-seat Hornet during a flight test event at NAS Patuxent River, Maryland, USA on April 2, 1985. Lt Col Tom Wagner tp, USMC was PIC and Sqn Ldr Ron Haack tp, RAAF was in the aft seat for observation.

TF/A-18 BuNo 161947 came off the McDonnell Douglas assembly line with an uncharacteristic roll divergence at 20° Angle of Attack (AOA - Alpha). McDonnell spent about 50 flight hours attempting to isolate the cause without success and the aircraft was transferred to the USN at a discount and assigned to the Strike Aircraft Test Directorate, NAS Patuxent River for further evaluation.

Coincidentally, the initial contingent of RAAF crews were also at Pax River with A21-101 and A21-102 conducting certification of RAAF unique modifications and analysis of system endurance in preparation for the trans-pacific ferry to Aus.

As the only other two-seat Hornet at Pax was the very first prototype and not representative of production A/C, the USN sought a handling qualities comparison between 161947 and one of the RAAF two-seaters. I was also interested in the anomaly and traded a flight in one of ours for a flight in 161947.

As with all flight test, handling qualities evaluation progresses incrementally from benign to worst case condition and the video records the last test point in the last mission of the planned USN evaluation.

The two-seat Hornet exhibits weakened, inherent directional stability simply due to the large keel surface forward of the Centre of Gravity (CG) formed by the extended nose and canopy.

For the last test flight, 161947's directional stability was deliberately weakened further by a centreline fuel tank, wing tip missiles and maximum lateral mass asymmetry; two VER (Vertical Ejector Rack) mounted 1,000lb GP bombs on the left outboard wing station yielding 22,000ftlbs of lateral mass asymmetry.

Planned manoeuvres involved a series of Wind Up Turns at Mach 0.7, 0.8, 0.9. (WUT – a manoeuvre that uses bank and dive/climb pitch attitude to maintain constant Mach/IAS at the required “g” or AOA condition.). WUT's were conducted both to the left and right and once stable at the test condition (speed & AOA), full deflection roll control was step applied

either into or out of the turn direction, e.g. right WUT, stable, full left stick, restabilise then full right stick.

The departure occurred at the last test point of the series in a right WUT at Mach 0.9, full A/B to sustain, and full left stick at 20° Alpha (approx. 6.5g). The A/C initially rolled left about 30° then sliced violently to the right like a Frisbee. Once initial energy was dissipated, the A/C settled into an inverted, rather smooth yaw rotation to the right. Both engines flamed out and relight automatically once the airflow streamlined and as can be seen, aerodynamics ultimately took over, pitched the A/C nose high then into a dive from which recovery was effected.

Once the A/C settled into the steady, inverted yaw rotation, I had the impression the fins had separated, and we were going to continue rotating into Chesapeake Bay at a high rate of descent so I reached for the seat pan ejection handle. Primary flight displays were in spin mode so basic flight parameters were not displayed on the Multi-Function Displays (MFDs) but the STBY instruments on the centre pedestal behind the stick indicated 18,000ft so I decided I could wait a while longer before ejecting.

I had command of the ejection sequence and I had seen Col Wagner's head bounce off the canopy quite strongly during the initial departure and he appeared to be slumped forward in the cockpit. There was no human noise from the front seat. At that point the A/C rolled upright, pitched nose high then into a dive like a dart and I got back on the controls to recover. I could not make contact with Wagner as his comms lead had disconnected so we were both trying to fly the aircraft out of the vertical dive back to level flight. He re-connected his comms, formally took control and we returned to Pax River for an uneventful landing. Had he been unconscious, an ejection would have been disastrous.

We entered the WUT at 30,000ft, Mach 0.9 and recovered at about 12,000ft. In the heart of the departure, the A/C lost 10,000ft in about 6 seconds so a fairly dramatic rate of descent. The entire event took less than 20 seconds. The lateral acceleration at the point of departure had been so violent that a BIC pen in Wagner's shoulder pouch was crushed between his left upper arm and the cockpit sill leaving quite a welt, the only injury. Surprisingly, there was no evidence of physical damage, all external stores remained attached and all systems operated normally.

While the video appears dramatic and I guess it was to some extent, after the initial violent departure it was quite a pleasant ride, a bit like a high speed merry go-round ride. However, there was no rest for the wicked, after de-brief and review of the video and the test data captured during the event, I flew a mission that night in A21-101 to evaluate the civilian VOR/ILS system the RAAF had installed in their Hornet fleet.

The USN determined that slight eccentricity of the Radome was generating a small side force sufficient to cause the roll off with weakened direction stability at medium angles of attack. A boundary layer treatment was applied to the lower surface of the radome and that eliminated the boundary layer asymmetry and thus the side force and returned the aircraft to standard behaviour.