THE STORY OF A RAAF FIGHTER PILOT ON USAF EXCHANGE POSTING

FLTLT Barry M SCHULZ, AFC

I was an USAF EXCHANGE OFFICER at the 414 FIGHTER WEAPONS SCHOOL NELLIS AFB, NEVADA from JANUARY 1972 until DEC 1974.

United States Air Force
Tactical Fighter Weapons Center
Fighter Weapons School

this certifies that

FLIGHT LIEUTENANT BARRY M. SCHULZ

successfully completed the

Fighter Weapons Instructor Course

conducted by the USAF Fighter Weapons School

and is therefore entitled to this

Diploma

given at Nellis Air Force Base, Nevada on this 23rd day

of August in the year of our Lord, Nineteen Hundred and Seventy two

COMMANDANT USAF FIGHTER WEAPONS SCHOOL

COMMANDER 57TH FIGHTER WEAPONS WING

COMMANDER USAF TACTICAL FIGHTER WEAPONS CENTER

There was also a RAF and RCAF EXCHANGE OFFICER at the FWS. Collectively, we 'NOFORNS' were 10% of the instructor population; this rose to about 30% whenever USAF instructors deployed on 'roadshows' to update US, EUROPEAN and SEA Squadrons on tactics and intelligence matters.

The FWS has a long history of being the centre of fighter combat expertise since post WW2.

The USN ‘TOPGUN’ SCHOOL is acknowledged as a like unit.

The RAAF’S FCI COURSE conducted by 2OCU is an equivalent centre of expertise. RAAF and USAF AIR COMBAT TACTICS were pretty much on par in the early 1970s.

The main role of the FWS is to train exceptional USAF Pilots and Weapons System Officers to become Fighter Weapons Instructors and Tactics Development Officers at their home Squadrons. The course was five months in duration and consisted of AIR COMBAT TACTICS, GROUND ATTACK RANGE, GROUND ATTACK TACTICAL, and NUCLEAR WEAPONS PHASES with extensive academic and flying components.

The FWS was also the USAF centre for tactical development and weapons employment procedures across all USAF fighter employment disciplines.

Every FWS instructor was qualified as an instructor in all roles.

The FWS was regularly subjected to ‘No Notice’ TAC Evaluation Assessments (TACEVAL) which included aircraft maintenance capability. All instructors were tested. Typically, an intercept was flown followed by ACM engagement. GUN CAMERA and RADAR FILM were assessed. We always carried a spare pre-recorded Radar Film Cassette in our G-suit, just in case the RADAR WAS not performing to specifications on the day.

The FWS was equipped with the upgraded F-4E modified with leading edge slats (an improvement in aircraft handling). Reputed to be departure-proof it was found that, if one tried, it would depart spectacularly.

Returning to base with a length of Drag-Chute Strap streaming behind the aircraft (deployment of the Drag Chute was the departure recovery procedure) was not a good look!.

TISEO was a long-range camera installed in the left-wing leading edge. It was capable of manually tracking targets or slaved to the RADAR Antenna.

The RADAR DISPLAYS were upgraded to digital displays.

TISEO was used to enhance ground and air target identification; eg, up to 15-20 nm on an F-4 sized target. This met rules of engagement requirements.

Before commencing the tactical training phases, students were re-taught how to fly the F-4E to the aircraft and their limits. USAF units were often restricted from low-level flight below 10,000 feet, no supersonic tactics, and a restricted envelope in which to fly the aircraft - G and ANGLE-of-ATTACK (AoA).

LOW LEVEL NAVIGATION skills were also honed.

This led to some interesting incidents with aircraft returning with branches and leaf matter in tanks!

BASIC AIR COMBAT MANOEUVRES had not really changed since WW1. Fighter performance, manoeuvrability and equipment have modified many classic manoeuvres, but a YO-YO is YO-YO, etc. The emphasis on 'DOG-FIGHTING' was almost negated by the missile era. However, the skill of close combat has reemerged with highly capable missiles and cannon.

The continuum in AIR COMBAT TACTICS from the KOREAN war theory and practice were inherited and applied up to the VIETNAM conflict period.

The USAF soon recognised that their successes in VIETNAM were far exceeded by the USN; kill ratios of 12:1 versus 5:1 were telling!

USAF HEADQUARTERS directed that the TACTICAL AIR COMMAND correct this anomaly. The FWS was, in turn, tasked with implementing change.

USN air tactics were studied at length and many of the USN tactics were adopted albeit, with a different title; eg, 'COMBAT PAIR' versus 'LOOSE DEUCE' etc. COMBAT AIR PATROL (CAP) tactics became the solution to protecting the strike aircraft thus enhancing their success and survival.

Further, the threat from enemy RADAR, SAM and AAA had to be addressed.

A decision to establish specialist Air Combat Squadrons in VIETNAM OPERATIONS, led to a new FWS role to train selected aircrew in newly developed AIR COMBAT TACTICS techniques before they were assigned to that theatre.

'… KNOW YOUR ENEMY' become a catch phrase in the FWS and intelligence on VIETNAMESE (ie, RUSSIAN and CHINESE) AIR COMBAT and AIR DEFENCE TECHNIQUES were studied at length.

The knowledge from 'CONSTANT PEG' programme was showing positive results. support from AWACS, 'WILD WEASEL' JAMMING AIRCRAFT, 'COMBAT TREE' (autonomous IFF on-board fighters), TISEO for longer range target ID to conform with rules of engagement, were all positive developments.

'CONSTANT PEG' was a natural outgrowth of the frustration many VIETNAM-ERA pilots had with the structure of their training.

At the time, USAF TACTICS dictated a four-aircraft, 'WELDED-WING' FORMATION. It was a configuration designed for combat with machine guns, with two aircraft serving as shooters, and two wingmen preventing adversaries from getting in close enough to attack the leaders.

In VIETNAM, though, the enemy primarily used MISSILES. A MIG could launch a tailshot from a mile back. Additionally, the WELDED WING was unwieldy, taking as long as 30 seconds to turn 180 degrees.

As VIETNAM veterans began to filter into the USAF FIGHTER WEAPONS SCHOOL and other training institutions, tactics began to change. The combat veterans established ways to turn the WELDED WING faster. They developed a TWO-AIRCRAFT FLUID TWO FORMATION.

Significantly, AGGRESSOR programs slowly took shape, with WEAPONS SCHOOL instructors using NAVY A-4S to simulate MIG-17S.

OPERATIONS AGAINST DISSIMILAR AIRCRAFT. Dissimilar tactics against T-38, F-5, A-4, F-102, F-106, A-7, F-104, and F-8 were introduced. Later an AGGRESSOR SQUADRON was formed and specialised in enemy air tactics.

I managed to fly backseat in all these aircraft during FWS sorties.

In this context, the idea of using actual MIGs seemed a natural next step. ‘It was a logical progression, in my opinion,’ said now-retired COL GAILLARD R. PECK JR. (ex FWS Instructor), the first commander of the 4477th at TONOPAH.

MIG-21 Fighter

US intelligence technology exploitation programs such as ‘HAVE DRILL-HAVE FERRY,’ and ‘HAVE DOUGHNUT’ began pulling MIGS apart to study their strengths and weaknesses as early as the 1960s. And so, one day in the mid-1970S, PECK found himself briefing MAJGEN CHARLES L. DONNELLY JR., AIR FORCE DEPUTY DIRECTOR of PLANS and POLICY, on the idea of a training program featuring actual MIGS.

DONNELLY thought it sounded good. He said he would provide the airplanes if PECK, then a TACTICS OFFICER based at the PENTAGON, could produce an airfield (GROOM LAKE, NEV was the obvious choice). PECK asked DONNELLY if he had a call sign; it was ‘CONSTANT.’ wandering back to his PENTAGON office, PECK thought of his wife, PEG. He recalls thinking, ‘CONSTANT PEG’ had a nice ring to it, and so it was!

VIETNAMESE air defence developments needed to be countered. Their detection capabilities and tactics had been developed and were becoming very successful. RADAR detection using intermittent RADAR SITE transmissions (to negate the anti-radiation missile threat) and triangulation from RADAR SITES were perfected. SAM RADAR, use of paired RADAR UNIT TRACKING (one in elevation the other in range) and with optical tracking fallback were many of the challenges. USAF EW and CHAFF were timely developments for all platforms. SAM EVASION manoeuvres became a skilled and successful technique

TACTICAL formation sizes, layout and manoeuvring were dramatically revised. TACTICAL formations were tending towards more fluid TWO COMBAT PAIR FOUR-SHIPS. Spacing was adjusted to enable better lookout capability, A more fluid formation dynamic was accepted and enabled more efficient lookout by all formation members. These all provided a degree of ‘self-protection’ to the formation.

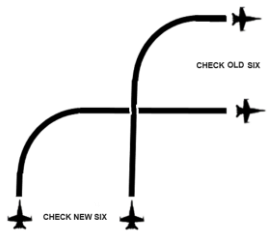
VISUAL SEARCH TECHNIQUE. The physiology of the human eye was considered and the following emphasised:

- **DETECTION**. An object must subtend about 1 minute of arc for the eye to be able to register the object in ideal conditions (this equates to about 10 m at 12.5 nm). to register an object, the eye must have a finite time for the light reflected by the object against the background to register on the retina and for the brain to analyse the image. If the eye is moved from the object, the image is no longer being registered and the object is lost. further, unless stimulated by focussing on a distance object, the eye ‘idles’ at a focal distance of about one metre; therefore, the eye must be re-focussed on a distance object (eg, cloud) for it to be able to register a distance object on the retina.

- **PERIPHERAL VISION**. If an object is moving with respect to its surroundings, it may be registered by the peripheral vision properties of the eye. this will automatically draw the eye to the object.

- **VISUAL SEARCH PATTERNS**. A disciplined pattern should be adopted to ensure that a search sector is thoroughly covered in the most efficient way. a steady slow to medium-paced sweep action sweep fore-aft along altitude bands or, an in-out sweep in sectors of about 10-15 degrees should be used.

FORMATION turns were developed to complete the turn as soon as possible to prevent predictability and the breakdown of lookout. DELAYED, IN-PLACE, and CROSS TURNS were introduced using 4-5G. WEAVES added to the unpredictability of formation navigation and variation in aircraft heights and spacing challenged GROUND RADAR and SAM / AAA OPERATORS. Closing and opening aircraft horizontal and vertical separation caused loss of radar discrimination at the 'merge' and denied tracking and firing solutions.



DELAYED TURN
CAN BE ADJUSTED FOR ANY DIRECTIONAL CHANGE;
eg, 45 / 60 DEG

IN-PLACE TURN

CROSS TURN & WEAVE

4-5G turns were made without radio calls by the formation leader using SOP wing rocks, wing flashes and porpoises to signal intent.

Conducting ACM required new techniques and communications. CALLSIGN discipline relaxed (formation callsigns reverted to personal callsigns in the heat of battle) and, highly descriptive 'verbal diarrhoea' of what one was doing and thought, being replaced with crisp short SOP phraseology:

- **ENGAGED** - *'I'm committed to my attack; you are to support me'*
- **IN / OFF** - '*I'm about to commit / I'm repositioning'*
- **SLICE BACK LEFT / RIGHT** - *'Turn back into fight nose low - the fight is LOW L/R'*
- **PITCH BACK LEFT / RIGHT** - '*Turn back into fight nose high - the fight is HIGH L/R'*
- **COME BACK LEFT / RIGHT** - *'Turn back into fight nose level - the fight is L/R'*
- **CLEAR** - *'I see you; you have no threats - I'm (CLOCK CODE) - HIGH / LOW'*
- **EXTEND (HEADING)** - '*Regain energy, standby to pitch back L/R / disengage'*

TACTICAL AIR COMBAT USING MISSILE AND GUNS. THE 'CONSTANT PEG' programme at GROOM LAKE involved FWS Instructors piloting and flying against various MIG types developing tactics against that threat.

In 1973 the FWS exchanged tactical knowledge with the attendance of two ISRAELI pilots - MAJ Asher SNIR (12.5 kills) and CAPT Eitan Ben ELIYAHU (5 kills+?) - both later became IDF AIR FORCE CHIEFS.

Aircraft fatigue was always a concern to me as the F-4E had no fatigue monitoring system. Pilot reporting was not reliable; eg, I physically pushed against an experienced FWS INSTRUCTOR as he pulled into a sustained 10G turn; during RTB he asked me to reset the G-METER and he applied 6G! He was pissed when I wrote the aircraft up as 'OVERSTRESSED' - the only proof being my back-seat G-METER recording 10G!

CAPT SNIR, IDF had an interesting landing because of failure of his aircraft's horizontal stabilizers in flight!

One aircraft was lost due a wing outer section folding during a Mach 1.2 - 7G PITCH BACK turn, cutting the aircraft in two. Subsequently, wing fold mechanisms were regularly inspected and eventually modified. For a period, pre-flight of the wing-fold mechanism was made using 'feeler-gauges' to check tolerances if up / down movement was suspicious.

AIR-TO-AIR GUNNERY. The TDU-10 'DART' towed target was used; straight, circular and combat tows (1v1 and 2v1) patterns were developed. The DART was air-scored by flying in formation and it was dropped at a designation range area.

1V1 COMBAT TOW. I achieved a 25 second kill against the DART. Other attempts were not quite as successful due to lack of RADAR lock.

The preferred technique was a hard turn towards the DART with an immediate roll under inside the DART'S turn to low YO-YO into a 'lead-pursuit' 6-7G approach at 'CORNER VELOCITY' for a firing solution. A proficient back-seater would achieve a lock-on or, the pilot would need to use 'BORE-SITE' MODE (a disadvantage was the need to go into 'pursuit' until lock-on and then lead-pursuit).

Once a tracking solution was achieved, open fire at 2000 feet with the good 'ole M-61 20 mm cannon.

Many pilots resorted to the 'spray and pray' technique or, the 'FLY THROUGH' shot.

The latter was taught as a valid technique, as any opportunity should not be wasted. If a TRACKING SOLUTION was not achievable, take a 'FLY THROUGH SHOT' and disengage!

The important factors being line, range, and lead … and of course avoid the collision!

At the FWS we even practiced un-authorised DART versus DART sorties!

Students were given high-G exposure at the BROOKS AFB, TX CENTRIFUGE.

I was appointed 'FWS CINE OFFICER' responsible for managing the GUN CAMERA ASSESSMENT FACILITY.

GUN CAMERA and RADAR FILM was extensively used as a debriefing tool.

The appointment also entailed 'SILVER RECOVERY OFFICER' duties (do not ask!). I overcame this onerous duty by acquiring COLOUR FILM!

CONVENTIONAL WEAPONS DELIVERY

Conventional bombing (using MANUAL and DIVE-TOSS SYSTEM deliveries), ROCKETRY and GUNNERY were practiced day and night on a scored range or tactical range targets across the NELLIS AFB range complex.

HE weapons (LOW and HIGH DRAG) tactical strikes (using MANUAL and LEVEL / DIVE-TOSS SYSTEM deliveries), were practiced DAY and NIGHT (self-delivered FLARES) against marked targets and simulated runways, vehicle convoys and infrastructure.

NELLIS AFB RANGE COMPLEX

VISUAL and RADAR NAVIGATION was used to approach the target area. DISSIMILAR AIRCRAFT and SAM / AAA threats were always employed.

TACTICAL RECONNAISSANCE using fast fac procedures were honed.

SLOW FAC using low level target marking from a distance was explored.

CONVENTIONAL WEAPONS

- **TRAINING WEAPONS.** BDU-33 Practice bombs, 2.75” Rockets and 20 mm cannon were used on basic day and night training.
- **TACTICAL WEAPONS**. HE SMART (LASER and ELECTRO-OPTICAL GUIDED) and HE BALLISTIC (HIGH AND LOW DRAG) bombs were used.
- **AIR-to-GROUND MISSILES**
- **ROCKETRY**
- **ANTI-RADIATION MISSILES**

I flew the prototype YA-7E for an evaluation tasked by RAAF WASHINGTON - three front-seat sorties included NAVIGATION and MULTIPLE BOMBING RUNS were conducted.

The next generation weapons delivery capability was impressive.

NUCLEAR WEAPONS DELIVERY

NUCLEAR WEAPONS profiles using B-61 (750 lb) (pictured), and B-57 (500 lb) ‘SHAPES’ (nuclear weapon inert bodies).

Computer controlled deliveries included LEVEL RETARDED, TOSS AND LOFT DELIVERIES.

The most enjoyable profile was the ‘LOFT’ where a ‘SHAPE’ was released in a 45 deg climb followed by an escape manoeuvre. After release, we would often roll towards the ‘SHAPE’ (it would be only 50 feet separation), and follow its trajectory in formation for as long as possible.

OPERATIONS IN A HOSTILE EW AND SAM ENVIRONMENT. Training against GROUND RADAR, SAM, and AAA, using RADAR HOMING AND WARNING (RHAW) equipment. By employing AGM-45 SHRIKE MISSILEs, radar emitters could be identified and engaged. However, if the SAM / AAA RADARS were used intermittently and / or in concert, they could lure the fighter into the 'VALLEY OF DEATH' with no escape.

An ELECTRONIC WARFARE RANGE was established in the CALIENTE VALLEY north of NELLIS AFB. This range was active during all training periods so pilots were always familiar with threat signals and tactical requirements. SOVIET SAM and AAA RADAR SIGNALS were generated and SAM LAUNCH SIMULATORS gave visual realty to the scenario.

Use of CHAFF AND FLARES. These were simulated during all sorties.

AIR REFUELLING. This was integrated into INSTRUCTOR currency requirements combining with ACT missions.

WEAPONS FIRE POWER DEMONSTRATIONS. These regular demonstrations to international military observers typically featured an F-4E dogfight against AGGRESSOR AIRCRAFT culminating in a live SIDEWINDER launch at a flare. An F-111 low-level supersonic delivery, F-4E multiple strikes and FAC-CONTROLLED CLOSE AIR SUPPORT was demonstrated using MISSILES, SMART and BALLISTIC BOMBS. Competition was intense to get high value weapons to deliver!

All the above elements were consolidated into the GROUND ATTACK TACTICS PHASE in which multi-aircraft STRIKE FORCE PACKAGES included DISSIMILAR AIR, ACTIVE SAM, AAA and EW RADAR and ELECTRONIC SIGNALS threats - these were the precursor to the 'RED FLAG' EXERCISES.

NOFORN INTELLIGENCE CRITERIA potentially restricted Exchange Instructors performing our duties in all FWS roles. However, at SQUADRON level, we were privy to all the necessary information to be effective instructors. We were excluded from highly classified briefings, Although, we were later briefed on them or, were able to listen to most briefings by means of access 'back stage' from my office! It was an unfortunate situation but fortunately, the squadron chose to turn a blind eye!

In 1974 I attended the USN 'TOPGUN' SCHOOL as an academic student and flying in the backseat of T-38, F-5, and A-4 DISSIMILAR AIRCRAFT with an instructor

WEEKEND 'CROSS COUNTRY' FLIGHTS - were always encouraged; of many, two of my more memorable flights being:

- **RCAF COLD LAKE, CANADA**

  - The first in 1973, saw our 4-SHIP F-4E formation denied crossing the Canadian border from MALMSTROM AFB, MONTANA. Ever cooperative, the RCAF flew down and picked us up in a mix of F-104G and T-33 aircraft ferrying us to COLD LAKE AFB.

Later that night, the TAC COMMAND POST ordered us to RTB immediately - our beer-charged response was not appreciated!

On return to MALMSTROM AFB (front seat F-104 - sweet aircraft!), our F-4E's were gone; They were already in ISRAEL on ALERT 3 within hours of arrival!

We were rescued by a fleet of USAF T-39 aircraft.

  - The second in 1974, I had DR GRAHAM MOLLER (NELLIS AFB F-111 Flight Surgeon) in the back seat. We went from a 40 deg C high desert to a -20 deg C snowstorm which took two GCAs to find the runway. During engine start two days later, hydraulic fluid from cold damaged seals covered the tarmac (wondered why all the F-104s were hangered!). We were rescued a week later. I got to fly a few F-104 range sorties.

    We returned via HILL AFB and a low-level tour along the GRAND CANYON. We were met by the WING COMMANDER. He was up the F-4 ladder before we could move - '*SCHULZ, DON'T EVER BREAK ONE OF MY AEROPLANES AGAIN'* (with a wide grin)!

- **ANDREWS AFB, WASHINGTON DC**

  - The RAF EXCHANGE PILOT and I flew to ANDREWS, AFB for a duty 'refreshments' pick-up from the EMBASSY suppliers.

  - We managed to squeeze 13 dozen of the best wines into the ex-NAPALM TANK TRAVEL PODS … bug eyed troops when we unloaded the booty!

An elected Australian LABOR GOVERNMENT saw the loss of this most valuable FWS EXCHANGE POSITION at the end of 1974. THE post was re-established elsewhere flying A-7, F-15 aircraft.

WGCDR B M SCHULZ, AFC RAAF, PILOT
1963 to 1998

Barry joined the RAAF on 17 January 1963 (No 49 Pilot's Course).

He was discharged as 'ON BEING MEDICALLY UNFIT FOR THE DUTIES OF HIS MUSTERING' on 2 August 1963.

He re-joined the RAAF on 14 August 1964 (No 54 Pilot's Course).

He was commissioned upon completion of pilot training on 13 August 1965.

He completed operational tours on **SABRE AND MIRAGE** fighter aircraft at RAAF WILLIAMTOWN AT:

- No 76 SQUADRON
- No 3 SQUADRON

After completing the RAAF FIGHTER COMBAT INSTRUCTOR (FCI) COURSE in 1968, he had **MIRAGE** operational tours at:

- No 3 SQUADRON 1968 to 1970 (RAAF WILLIAMTOWN and AIR BASE BUTTERWORTH, MALAYSIA)
- No 2 OPERATIONAL CONVERSION UNIT 1971 and, 1975 to 1977 (RAAF WILLIAMTOWN)
- No 75 SQUADRON 1980 to 1981 (AIR BASE BUTTERWORTH, MALAYSIA)

Barry served on UNITED STATES AIR FORCE (USAF) EXCHANGE DUTIES flying:

- **O-2A** aircraft as a FORWARD AIR CONTROLLER (FAC) and FIGHTER COMBAT INSTRUCTOR (FCI) in the REPUBLIC OF SOUTH VIETNAM (1970)
- **F-4E** fighter aircraft as a FIGHTER COMBAT INSTRUCTOR (FCI) at the USAF FIGHTER WEAPONS INSTRUCTOR SCHOOL (NELLIS AFB, LAS VEGAS NEVADA 1972 to 1975)

  He attended the USN FIGHTER WEAPONS SCHOOL at NAS MIRAMAR, CA in 1975

From 1977 to 1979, he served as a STAFF OFFICER in the DIRECTORATE OF PERSONNEL (AIR FORCE OFFICE, ACT) as the:

- OFFICER PLANNING and POLICY STAFF OFFICER (OPLANSP2)
- OFFICER REPORTING and PROMOTION BOARD ADMINISTRATION OFFICER (POADMIN1)

Barry attended the RAAF ADVANCED STAFF COURSE (RAAF FAIRBAIRN, ACT) as:

- ADVANCED STAFF COURSE member in 1982
- DIRECTING STAFF / SYNDICATE LEADER (DS/SYNLDR) in 1983
- COURSE COORDINATION OFFICER (RAAFSCOORD) in 1984

In July 1984, BARRY was posted to HEADQUARTERS, INTEGRATED AIR DEFENCE SYSTEM - HQIADS (AIR BASE BUTTERWORTH, MALAYSIA):

- as STAFF OFFICER-TRAINING (SOTNG)
- FLYING **CARIBOU** TRANSPORT AIRCRAFT

In July 1986, he was posted to AIR FORCE OFFICE, ACT as:

- OPERATIONAL REQUIREMENTS-FIGHTER (ORFTR)

He completed **F/A-18** fighter training in June 1988.

In 1988 to 1989 was posted to TACTICAL FIGHTER GROUP (RAAF WILLIAMTOWN) as:

- STAFF OFFICER-PLANS AND DEVELOPMENT (SOPD)

He was posted to AIR HEADQUARTERS AUSTRALIA (RAAF GLENBROOK, NSW) as;

- STAFF OFFICER-OPERATIONAL EVALUATION (SOOPEVAL) -1990 to 1991
- STAFF OFFICER-PLANS AND POLICY (SOPP) - 1992 to 1993

From January 1994 to July 1995, he was posted to AIR FORCE HEADQUARTERS (ACT) as:

- TACTICAL FIGHTER PROJECT MANAGER (TFPM)
- TACTICAL FIGHTER PROJECT COORDINATION and DEVELOPMENT (TFPC&D)

From July 1995 to December 1998, Barry was posted to the DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION AS:

- STAFF OFFICER TRIALS (SOTRIALS)
- DEPUTY DIRECTOR TRIALS - AIR FORCE (DDTRIALS-AF).

Barry retired on 7 December 1998 with WING COMMANDER rank. He served in the RAAF for 35 YEARS.

Barry was a volunteer in the ROYAL VOLUNTEER COASTAL PATROL and MARINE RESCUE NSW from 2000 to 2010. He was the State EDUCATION AND TRAINING OFFICER, OFFSHORE LIFEBOAT SKIPPER and SEARCH MASTER at the PORT STEPHEN'S UNIT.

RAAF CAREER FLYING EXPERIENCE

- **WINJEEL**
- **VAMPIRE**
- **SABRE**
- **MIRAGE**
- **CARIBOU**
- **F/A-18**

USAF EXCHANGE OFFICER - VIETNAM FORWARD AIR CONTROLLER (FAC) - 1970

- **O-2A - SKYMASTER**
  - *OV-10 - BRONCO*
  - *O-1E - BIRDDOG*
  - *CESSNA 180 - VISUAL RECONNAISSANCE*
  - *BELL UH-1H IROQUOIS*
  - *BELL H-13 - SIOUX - VISUAL RECONNAISSANCE*

USAF EXCHANGE OFFICER - USAF FIGHTER WEAPONS SCHOOL - 1972 TO 1975

- **F-4E - PHANTOM**
  - *F-105F - THUNDERCHIEF*
  - *TF104G - STARFIGHTER*
  - *YA-7H - CORSAIR*
  - *F-106B - DELTA DART*
  - *TA-4J - SKYHAWK*
  - *T-38B - TALON*
  - *F-5F - TIGER*

AWARDS AND DECORATIONS

AFC **Air Force Cross** (1982) - *'... FOR SERVICE TO THE RAAF, PARTICULARLY AS THE EXECUTIVE OFFICER OF NO 75 SQUADRON.'*

QCVSA **Queen's Commendation for Valuable Service in the Air** (1976)
'... FOR PERFORMANCE OF FLYING DUTIES AND INSTRUCTION.'

AUSTRALIAN ACTIVE SERVICE MEDAL: 1945 - 1975
VIETNAM MEDAL
DEFENCE FORCE SERVICE MEDAL (THREE CLASPS)
NATIONAL MEDAL
REPUBLIC of VIETNAM CAMPAIGN MEDAL
AUSTRALIAN DEFENCE MEDAL
RETURN FROM ACTIVE SERVICE BADGE

OTHER NATIONAL AWARDS:

USAF AIR MEDAL (NINE OAK LEAVES)
REPUBLIC of VIETNAM CROSS of GALLANTRY with PALM UNIT CITATION

MARINE RESCUE LONG SERVICE MEDAL (10 years)