

The Guild Goes To School In Canada

P.C. FYNES

It's a pilot project!" quipped Guild Canada's Chairman, John Burley, to Wayne Cave, Director of Flight Operations at Coastal Pacific Aviation. When the Guild decided to ally itself with one of Canada's leading pilot training organizations, the obvious choice was Coastal Pacific which, like Guild Canada, is headquartered in Abbotsford, B.C. This year's class of 19 freshly minted, multi-IFR rated, commercial pilots will receive Guild membership courtesy of Coastal Pacific for their first year as professional pilots.

This initiative is part of the Guild's wider efforts to build ties with industry leaders and learn how it can best serve the next generation arriving on the flightdeck. If this 'pilot project' in Abbotsford lives up to its promise, it will quickly be extended to other aviation colleges across Canada.

Coastal Pacific Aviation was established in 1973 and, under the direction of founder Cole Shelby, soon gained a reputation for high standards. In those days, civil flight training was broadly conducted on the basis of "Read the next chapter in the book tonight and we'll see you tomorrow". Shelby however believed in the integrated approach to professional flight training and he designed scripted programs incorporating classroom theory, simulator exercises and actual time in the aircraft. Not surprisingly, the idea caught on in a big way.

Today Coastal Pacific provides flight training, on behalf of the University of the Fraser Valley and Trinity Western University, in its immaculate blue-and-white fleet of 11 Cessna 172's and 3 Piper Twin Comanches. All aircraft are equipped with GPS receivers to ensure that students are comfortable and competent with 'sat-nav', which is the future standard for the industry. Two purpose built simulator centres now house 6 PFC flight training devices in addition to a Beechcraft King Air and an ex-Air Canada 747 motion simulator. The school also has multimedia classrooms and all the modern training aids to ensure



efficient learning. Student progress through the lesson plans is carefully tracked and it's evident that the trainee is the beneficiary of Coastal Pacific's expectations and methods. Old black-and-white, framed class photos on the walls whisper encouragement to the present generation of uniformed students who are going about the task of earning their wings.

While most of Coastal Pacific's students are drawn from Western Canada and specifically the two nearby universities, overseas students are increasingly aware of the benefits of training in Canada. Nationwide, approximately one-third of the almost 700 aeroplane CPL's issued by Transport Canada in 2007 were granted to visa students. Despite recent currency fluctuations, the cost of obtaining an ICAO standard licence in Canada remains a comparative bargain. A two-year Aviation Diploma and a four-year Bachelor of Business Administration (Aviation) degree are offered at Abbotsford with both options providing a CPL, multi-engine and IFR ratings, 140 hours of simulator and 207 hours of logged flying.

Diploma students are required to hold a PPL prior to admission to the program. If desired, this prerequisite licence can be completed at Coastal Pacific for \$11,500 /

£6,390 (based on an approximate exchange rate of £1 = \$1.80). The flying and tuition for the two year program itself amount to \$55,000 / £30,560.

Degree students obtain their PPL in the first year, CPL in the second and multi-engine IFR in the third. In their graduating year, the BBA students specialize in either an Instructor rating or Heavy Jet transition course. Cost including non-aviation academics is \$89,000 / £49,450. Although the fees for aviation related training are the same for everyone regardless of citizenship, foreign students pay slightly more for the academic business courses taught at the universities.

"Aviation is not for everyone" explains Coastal Pacific's Wayne Cave, so there is an interview and selection process to "protect the applicant's investment". Sometimes he defers offers of admission until English language proficiency is achieved or until the candidate demonstrates the level of maturity required to meet the challenges of the program.

Cave, who learned to fly in 1965 and spent many years in management positions before returning to the aviation industry several years ago, is an astute judge of character. He notes that 18 year-olds are sometimes still finding their way

in life and are difficult to evaluate in absolute terms. Cave is pleased that his intuition has worked well and he is gratified to see young people “blossom” into responsible and capable pilots in a few short but busy years. Cave is currently in discussions with the Guild about how its successful “Aptitude Testing” program in the U.K. might be adapted for use in Canada.

Psychological profiles already show that aviation seems to attract ‘achievers’ who prefer to work alone, rather than in groups. For this reason, Coastal Pacific ensures that its students are well versed in Crew Resource Management from the outset. Even training in the C-172 is conducted with an extra student in the rear seat observing the two pilots in the front. Advanced courses employ Transport Canada’s “Threat and Error Management” model to review human factors performance. In short, when these pilots enter the industry, they are very familiar with the checklist discipline, standard operating procedures and the interpersonal skills which define an effective crew.

The academic and practical training which Coastal Pacific students obtain is well regarded by the industry and so employers across the country snap up their graduates. Following every wings ceremony there is a diaspora which, due to Canada’s physical size, makes it difficult for Coastal Pacific to stay in touch with its former students. Closer contact with the alumni through the Guild will help new graduates build a network of contacts but more importantly, will provide feedback that the training programs are tuned to the industry and the latest developments.

One of the joint initiatives of the Guild and Coastal Pacific will be the establishment of a mentorship program between new and experienced pilots, especially alumni. John Burley notes that “Many older pilots want to give back and offer a helping hand to those taking their first step on the career ladder” and Wayne Cave believes that his newly qualified pilots will benefit enormously from the encouragement and advice of people with many years of practical experience.

When Coastal Pacific’s ‘Class of 2009’ accepts their wings, they will be very aware of the effort they and others have



Inside the B747 simulator

expended to make this day possible. They will have reached their goal and very soon their class picture will hang proudly in the foyer, like those who have gone before.

The pilots in the ‘Class of 2009’ will start their careers as Guild members and can feel assured that their association with the Guild of Air Pilots and Air Navigators will be as positive and rewarding as their years at Coastal Pacific. The Guild warmly welcomes the enthusiasm and potential of these newest members.

The Guild has gone back to school at Coastal Pacific Aviation as they share our vision and our standards. Together we hope to promote the mentoring program as a way of involving the youth of today in the future of the Guild. ✈️



The B747 simulator



Wayne Cave at CPA



Twin Comanche on Abbotsford flight line

Hawk Flight

17th December 2008

ASSISTANT DOROTHY POOLEY

People sometimes ask me “what is the benefit of joining a Livery company?” Well, one of the great benefits is attending the splendid dinners held in impressive Livery halls in London where one meets really interesting people. At one such dinner very recently, I was privileged to meet (for the second time) Wing Commander Adrian Hill OC 19(F) Squadron at RAF Valley. A few days after our encounter imagine my surprise to receive an email inviting me to visit RAF Valley and fly the Hawk!

A long train journey from London took me to Bangor, where I was met by a young officer who drove me to the base in pouring rain. The only activity that afternoon seemed to be the arrival of the Red Arrows! Meanwhile, I was taken to have my helmet and mask fitted, an uncomfortable procedure which took about forty minutes (it would've helped if I had had the regulation RAF haircut!) and from there I went to see the nurse. She checked that I had the right leg length and thigh length. Fortunately, I managed to make the minimum weight by 2 kg and I was tall enough (it would have been difficult to gain that amount of weight even in the mess overnight). After speaking to the doctor who checked my ears and discussed the pros and cons of airsickness when pulling g (I have a little experience with that!), it was back to kit fitting.

The kind lady introduced me to the sartorial elegance of RAF longjohns complete with Y front (!), roll-neck sweater, thick knee socks, woolly “bunny suit”, followed by full rubber lined immersion suit, coveralls, g-suit, boots, leg restraints, gloves and finally life preserver. Trussed up like a chicken I had amazingly gained 14kg! After undressing and putting my own clothes back on again (an exhausting procedure taking over an hour!), we then went to the simulator

Dorothy in full fast jet flying kit, including RAF issue longjohns.



where I learnt to take off and land, practised low level high g manoeuvres around the Welsh hills and then some aerobatics. Feeling slightly unbalanced when I left the simulator, we stopped for a cup of tea before I was shown a video on safety aspects normally reserved for passengers. Finally, it was down to the mess for drinks, chat and dinner. I retired early to my billet – the VIP suite! (what did I do to deserve this?), where I was fascinated to read the names of all the real VIPs who had signed the visitors book!

Next morning up whilst it was still dark, for breakfast at 7 am followed by the met briefing at 7.30. This was given by a real live met forecaster and attended by everyone who was intending to fly that day. It was followed by an ops briefing covering all the nav warnings, NOTAM etc and Adrian introduced me to the squadron as their guest for the day. I was then taken to the planning room where I was shown the computer tools used for planning our route and all the paperwork was completed including checking of warnings and submission of Deconfliction forms and mission forms.

By 8.40 I was in the changing room, donning all my kit, which took about half an hour! We then walked out to the aircraft and I exclaimed that I had wanted a red one! After a few photographs, another young officer helped me to strap in, attach the parachute, attached my leg

restraints to the appropriate fixings, plugged in my PEC and helped me with the helmet and visor. Next I had to take out the pins to make my seat live. We then started up and after obtaining Air Traffic clearance, I was allowed to taxi the aircraft to the holding point.

At 9.30 precisely (the flight planned time), we took off, climbing to 1000ft where we levelled off. We then proceeded with our mission of attacking several simulated targets in Wales, which involved flying at 250ft and 420kts around the valleys and mountains of Wales. We flew several high g manoeuvres and at times, I felt my vision beginning to grey at the edges. I found the pressure from the g suit really unpleasant to start with, but once I got used to it, I was able to anticipate its inflation as we started to pull g and tense my stomach muscles which helped considerably. At 250ft and 420kts the terrain is covered incredibly rapidly and having done some contour flying and pulled round the corners at 150° of bank, well below the level of the hills, I was relieved to do something more sedate and simply give Shobdon aerodrome a low fly-past. I was even able to get my camera out at this point and take a few pictures. We also had time within our allotted hour, to look at the ability of this amazing aircraft to climb by pulling straight into the vertical from low level and topping out at 12000ft, with the aircraft still doing 180kts

at the top. We then pushed over the top and dived straight back down. A few rolls and loops before returning to Valley for some circuits (I managed this tolerably well) and a PFL from 5000ft in the overhead.

On landing there was plenty of help with unstrapping all the various leads and wires and quite overwhelmed, I accompanied Adrian to the booking in office. We received our Inbrief and filled out mission report forms plus various other reports of the airspace we had used in case of low flying complaints. I then had to remove all of the kit and hand it in and was delighted when I was presented with my gloves to keep as a souvenir. Then my logbook was signed and Adrian went off to do his next flight! All in a day's work. Some people get all the fun. Back to the C152...



Strapped into the rear seat and ready to go



Dorothy's view from the rear seat



Guild Visit to Martin Baker Aircraft

ASSISTANT TOM EELES, EJECTEE. PHOTOS COURTESY MBA

On the afternoon of 6th May 30 Guild members stood on the breezy airfield at Chalgrove, intently looking out to the north east. The object of their attention soon came into view, the unmistakable shape, and sound, of a Gloster Meteor at nearly full speed. As the immaculate black aircraft passed in front of them at 450kts, there was a sharp crack and in the blink of an eye an ejection seat shot out, the drogues and parachute deployed and the test mannequin was gently lowered to the ground. This was the culmination of a fascinating and instructive visit to the Martin-Baker Aircraft Company (MBA), superbly hosted by Company staff.

The 30 visitors, which included 4 ejectees (Gordon Dobbie, Sea Hawk and Sea Vixen, 1960, Past Master Duncan Simpson, Harrier, 1969, Tom Eeles, Buccaneer, 1970, Rod Spears, Hunter, 1982), were welcomed by James Martin, son of Sir James. Andrew Martin, Head of Business Development, gave a comprehensive briefing on the Company's activities,

which included some intriguing statistics. Apparently the MB5 fighter aircraft, built and flown towards the end of WW2 but never put into production, receives the most hits on the Company's website! Martin-Baker Aircraft remains very much a family business. The Company has 3 major sites in the UK, at Denham, Chalgrove and Langford Lough in Northern Ireland, plus many overseas facilities. With 60 years experience in work on aircraft assisted escape systems, the Company employs 650 personnel, has made 75,000 ejection seats and 10,000 crash worthy seats (mainly for helicopters), has provided seats to 92 Air Forces, designed more than 200 escape systems, won 10 Queen's Awards to Industry and most significantly has saved 7276 aircrew lives at the time of our visit. Of the Company's production 78% is for export, 4% is for the UK MOD and 18% is for other UK users, mainly BAe Systems. MBA's share of the world market in ejection seats is 40%, its nearest rival being Goodrich with 23%. The Company expects to increase its share to 63% by 2035, when JSF production is at its peak.

And President Sarkozy says this country does not make anything any more ! The range of ejection seats has now reached the Mk 16, which has been chosen for the JSF F35 Lightning 2, which is expected to be manufactured in very large numbers. This seat represents the cutting edge of assisted escape technology. By way of contrast, MBA still support the many early ejection seats still in use around the world. MBA have also been involved in many seat retrofit programmes, including such US aircraft as A37, T38 (over 450 aircraft !), a telling endorsement of the Company's product. Some 200 different aircraft installations have been designed and built. On average one in every 10 seats is used in anger and over the last 12 months 36 lives have been saved.

Steve Roberts then gave us a brief on the Mk 16 seat, designed for the JSF F35. This is a very large programme, the USAF alone being expected to order 1763 aircraft, with other customers including the US Navy and Marine Corps, the UK MOD and the many other air forces world wide, some currently using the F16. In

The Guild visitors with MBA's aircraft at Chalgrove



*From cockpit to
parachute...*



... in 2 seconds

order to cater for failure in the STOVL flight regime auto ejection will be incorporated, the traditional seat safety pins will have disappeared, the seat will cater for a very wide range of body mass, from small light females to tall heavily built males and the time from seat firing to full parachute deployment will be an astonishing 2 seconds.

During a tour of the Denham facility Guild members saw a wide range of activities, ranging from computer aided design techniques to parachute packing and seat component assembly and environmental testing.

After an excellent roast beef lunch the party embarked on a luxury coach for the journey to Chalgrove airfield, where the MBA Chief Test Pilot, Andy Gent, gave a briefing on the airfield's history and the Company's current flying activities. MBA operate 3 aircraft, a King Air for light transport duties between UK facilities and its European commitments, and 2 Meteor aircraft modified for ejection seat

testing. One of these aircraft is believed to be the oldest jet aircraft on a military register anywhere in the world still flying. These aircraft are ideal for airborne testing, with no problems associated with efflux or debris from seat firings being ingested into the engines. They are simple, reliable and cheap to operate, have an adequate performance and are the only aircraft certified for airborne ejection seat test firing in the western world. One is nearing the end of its fatigue life so is used sparingly but the other one, painted in a handsome black livery, has many years of useful life left in it. Apparently the supply of Derwent engines, now long out of production, is not yet a problem although there are some safety and liability issues with the manufacturer, Rolls Royce. The firing that we were to witness was to test certain components of the Mk 16 seat. Although the firing parameters included a maximum speed of 450kts, the equipment to be tested was

modified so that it simulated an ejection from 600kts. The live firing was conducted over the airfield, witnessed by the Guild members. It was a strange sensation to watch the Meteor pilot's subsequent low passes with the ejection gun tube sticking high out of the rear cockpit ! As a conclusion to the visit the IPM, Air Commodore Rick Peacock-Edwards, thanked James Martin for a truly wonderful visit to one of the Guild's affiliated Companies and a world leader in ejection seat technology, manufacture and support. Although he had never had to use one of the Company's products in anger they had given him great confidence during his time as a fighter pilot in the RAF in their ability to save life if need be and he presented James Martin with a Guild plaque in commemoration of the visit. For those of us who have had to use MBA's excellent product in anger, all we can say is 'Thank you, Martin-Baker, for the rest of our lives'. 

Flying the F86A Sabre

BY MARK LINNEY, UPPER FREEMAN, CHIEF PILOT GOLDEN APPLE OPERATIONS LTD

History

The F86 was an aircraft way ahead of its time and featured many unproven technologies. The list of “firsts” for this aircraft is impressive, however G-SABR is typical of many “A” model aircraft of the era, namely it is somewhat unrefined and underpowered. For me the allure of flying the F86A comes from the idiosyncrasies that were developed out in later models.

Getting it all fired up!

The ejection seat in G-SABR is fully functional but when compared to modern zero-zero rocket seats has poor performance requiring both height and speed for a successful escape; it also lacks the simple operation of later seats thus requiring some premeditation leading up to its use. On the plus side, due to the high-set seat position and bubble canopy, the outward and rearward visibility is as good as it gets and indeed better than many modern day fighters. The only area where visibility is poor (especially in a rain shower, where it is non-existent) is out the front, this being primarily because of the “vee” shaped windshield; another aspect of the design changed on later variants.

North American did a very good job with the cockpit layout at a time when the science of “ergonomics” was yet to be invented; controls and instruments are well placed, easy to use and interpret. By comparison the Soviet counterpart of the era, the MiG 15, was chaotic and agricultural. F86 pilots were driving a thoroughbred sports car, MiG 15 pilots were riding on a tractor!

There are almost no electronics in the F86A and nothing even remotely resembling a computer. Everything is truly pilot controlled this being especially true of the engine. The J47 is a very basic and unrefined first generation turbojet highly susceptible to surging across the whole operating range and is slow to accelerate; it is also easy to over temp, especially during start.

The hydraulic system manages to be somewhat complicated, yet very basic at the same time. In many respects this system is the weakest on the aircraft. Hydraulics power the undercarriage, wheel brakes, speed brakes, nose wheel steering, ailerons and elevator boost. Each system is backed-up in some way but in normal use they are serviced by a single pump

delivering pressure to a single line via a single reservoir, all without any notion of a priority system to protect vital operations or lacking an accumulator to take up the slack! After engine start there is a protracted process designed to bleed air from the system. The management thereafter is to always ensure that adequate pressure exists to protect the flight controls; the system simply can not provide enough pressure to satisfy simultaneous demands. The aircraft can be flown in “manual” if required and the landing gear can be lowered using a back-up system i.e. gravity! Luckily the flaps and trimmers are electric!

Cleared for takeoff

Once lined up on the runway there are just few more things to check before we can rush off in a cacophony of earth-shattering noise and climate-changing smoke. (Note about the smoke: during the Korean War the allied forces’ primary friend or foe recognition feature was that if it smoked it was friendly – the MiG 15 used a copy of the Rolls Royce Nene which was a clean-burning centrifugal engine). The engine has two fuel systems; very basic and an emergency system that’s even more very basic. The throttle can be likened to simple tap in both modes and we test these systems by gently turning this tap on and off to allow more or less fuel in to the engine. Engine acceleration is woefully slow from idle and at all times we have to be careful to avoid a surge. Once above about 70% power the acceleration and handling become much more acceptable although never “care-free”, as in modern aircraft. Finally the potentially life-changing final check of hydraulics and trim is completed and with brakes released the takeoff roll commences.

The rate of acceleration is not rapid, but it is steady. The rudder is fully effective at 50 knots and at about 95-100 knots the technique is to begin taking the weight off the nose wheel. This aircraft must not be rotated too nose high (that just adds a bucket of drag to the competing forces struggling to get airborne) but by lifting the nose a few degrees some lift-giving angle of attack is introduced and at 110-115 knots the Sabre comes smoothly off in a fairly nose-low attitude. With a positive rate of climb landing gear is selected up and at about 150 knots the flaps are



retracted. Once cleaned up the Sabre picks up speed fairly quickly.

So what’s it like to fly?

Below 250 knots the Sabre is actually not that nice to fly; above 250 knots however it is delightful, responsive, dynamic and well balanced. It is enough to say that at high speed and at aerobic levels of energy the Sabre is vice-less and although quirky, is really, really nice to fly. It is common for airshow commentators to chant the “if it looks right, it flies right” mantra when describing the F86. All I can say is that they do not know what I know! They are partly right, but also terribly wrong. This aircraft was built for speed and is not all that happy wallowing about in the circuit with its trousers down.

Without getting too deep in to the laws of aerodynamics there are a whole host of factors which come together when slow and coincide at around about landing speed which makes life difficult. Poor engine response, “Dutch roll”, high angle of attack, increase in drag (it is very easy in this aircraft to get “behind” the drag curve, literally) and poor visibility out the front all require the utmost attention from the pilot. Get a little bit too slow in the Sabre and you get that swept-wing sinking feeling which if not checked will run you out of power and back-stick with inevitable consequences. It is not helped that G-SABR has had its slats disabled (for permit reasons), which was an aerodynamic feature that part-solved some of these traits. I don’t want to overstate the poor handling because the pilots that fly the aircraft are all highly experienced and understand the limitations; in 1948 without the benefit of a two seat trainer or an extensive pool of experience early F86 pilots transferring from types such as the P51 or even the P80 with straight wings and decent power response must have had a few surprises.

A specific characteristic of the “A” model’s wing design was the enormous dimensions of the ailerons. Whilst this gave the aircraft an amazing (and amusing) rate of roll it caused problems too. The pilot’s flight manual ominously

states that roll control above 250 knots is “impossible” following a failure of the hydraulic aileron boost. This is true in so much as the air loads on the “barn-door” sized control surfaces prevent any worthwhile movement, however a measure of roll control using rudder is possible and reasonably effective as with many swept-wing types. The physical size of the ailerons was drastically reduced in later variants.

The aileron boost is another quirky system that testifies to the Sabre’s first generation swept-wing design status. Movement of the control column against the high air loads creates a resistance which the pilot pushes against. Just when you wonder if the system is actually working the boost wakes up and delivers a helping hand to the tune of 36 times the input of the pilot. That’s zero assistance to 36 times the power in the blink of an eye; there is nothing progressive or subtle about this system!

Something you will not see a Sabre pilot doing very much of is negative “G” manoeuvres or prolonged inverted flight. The secondary effect of being up-side-down for any more than a few seconds is almost always a hydraulic failure. This happens due to fluid that normally covers the out-flow pipe in the bottom of the reservoir being replaced with air, which is then sucked through the system.

The fuel system is simple and reliable (touch wood) doing exactly what it says on the tin with the minimum of pilot intervention.

The landing – always the most important part

Bringing the aircraft back in to the circuit is always a critical time. This is where the pilot has to raise his game with the added pressure that invariably fuel reserves will be low. Once the aircraft is in trim the speed brakes are selected out. These are a big load on the hydraulic system and they do not always come out symmetrically; if this happens the aircraft snakes a bit, but not enough to be of concern. Once deployed fully the hydraulic pressure starts to rise again (there is no gauge to show speed brake position).

Next it’s time for the landing gear to go down. The sequence relies on electrics, hydraulics, cables, pulleys and various micro-switches (to relay the positions of up-locks, down-locks and gear doors). When the sequence is all working properly the gear locks down, “three greens” are shown in the cockpit and the doors close. Big sigh of relief! Emergency lowering involves some physical contortions with a

long wire cable so the three little green lights are always most welcome.

At any time below the limiting speed the electrically driven flaps can be deployed without fear of sapping any of the precious hydraulic supply. The flaps only have one setting. They provide lots of lift but not much drag which is why we land with the speed brakes out to improve engine response.

In the landing configuration the aircraft can easily go-around and we aim to keep a minimum of 70% RPM to facilitate this and give the engine a better acceleration rate. We aim to tip in to the finals turn at 150 knots, reducing to 130 knots once lined up with the runway.

Touch down is at about 120 knots and if the throttle is closed too soon this can be firm; the nose-high attitude means that a fair amount of lift is provided by the engine so it is usual to land with a small amount of power still applied.

One area where the Sabre excels is in its ability to stop. The brakes are incredibly good and they grip fantastically well, even in the wet or in a cross wind. There could possibly be some negative angle of attack when the aircraft is on all three wheels which give “Formula 1” aerodynamic style down-force!

Other “quirks” and oddities

The aircraft can be flown with the canopy open at up to 210 knots.

The landing gear up-locks are the same as on a Harvard.

The J47 is the same engine as was fitted to the B47 bomber – which had six! Six times the smoke, six times the noise, six times the trouble etc!

G-SABR spent many years in a children’s play park – it was saved and restored primarily because (unlike other Sabres) it had not had its spars cut through.

The aircraft (apart from modern batteries,

battery chargers, the ejection seat, minor part changes and some radio equipment) is in “stock” condition.

The legendary F86A

Construction of G-SABR began in 1948 with entry into service with USAF Strategic Air Command following in April 1949 therefore this year we will celebrate the 60th birthday of what we believe to be the OLDEST airworthy jet powered aircraft in the world as well as what we know may be the ONLY existing airworthy “A” model. This is truly a historic, valuable and much cherished aircraft. It is a living monument to a by-gone era when designers, engineers and pilots were all pushing back the boundaries of aerospace, science and technology and at a pace unlikely to ever be repeated again. It is a privilege to fly.



Mark Linney joined the Royal Air Force in 1980 and completed tours on the Tornado GR1 (16 Sqn), Hawk T1 (CFS), and Harrier GR7 (IV Sqn). He is an A2 Qualified Flying Instructor, having been a Central Flying School Instructor on the Hawk.

Mark was the RAF’s solo Hawk display pilot in 1990 and winner of the Brabyn trophy in 1990 & 1991. On his last tour flying the Harrier, Mark saw operational service in Northern Iraq (Operation Warden) and Bosnia (Operation Vulcan).

Mark left the Royal Air Force in 1996 and started his commercial flying career with Air 2000 flying the Boeing 757. In 1998 Mark moved to Virgin Atlantic Airways initially on the Boeing 747 classic before converting to the Boeing 747-400. Mark is currently a Captain on the Airbus A340 and has flown over 11,000 hrs.

On the civil display circuit Mark has previously flown the Chipmunk, Harvard, Hunter, Strikemaster, L-39, MiG 15, T-33 & F86A.

www.goldenappleoperations.org



Guild Visit to Defence Helicopter Flying School, RAF Shawbury

PAST MASTER ARTHUR THORNING

A party of 20 Guild members, led by the Master, accepted an invitation to see the work of the Defence Helicopter Flying School (DHFS) at RAF Shawbury on 22nd April. After a convivial dinner and an early breakfast at the Prince Rupert Hotel in Shrewsbury our party were collected by Flying Officer Kenny Docherty and taken by bus to Shawbury. We were welcomed by Group Captain Jock Brown, the Commandant of DHFS who gave us a comprehensive briefing. The role of the School is to train helicopter pilots and crewmen of all three services. It provides a world class helicopter flying training system, a claim which is confirmed by the overseas nations which send their personnel for training. Over 30,000 flying hours are achieved each year with over 90,000 movements. The aircraft complement is 27 Squirrel helicopters and 11 twin-engined Griffin HT1 aircraft, otherwise known as the Bell 412 EP (plus one to increase crewman training). There are 130 flying instructors; most are serving officers with some 40% civilians, all ex military. Approximately 220 students are under training at any one time although some 450 will pass through the school at some time each year.

The DHFS comprises four units; 660 Squadron Army Air Corps, 705 Naval Air Squadron, 60 Squadron RAF and the Search And Rescue Training Unit (SARTU) which operates from RAF Valley (Anglesey). Although the aircraft are on the military register the School is supported through a Private Finance Initiative contract with FB Heliservices Ltd who provide flying hours, technical and domestic services and the civilian

flying instructors.

Ab initio helicopter students arrive at Shawbury after Elementary Flying Training on light fixed wing aircraft. The students then follow a Single Engine Basic Rotary Wing course of 38 hours in ten weeks. Most solo after 11 hours on the Squirrel. This is followed by a Single Engine Advanced course, which varies somewhat in length depending on the requirements of each service, the Royal Navy taking longest, at 47 hours and 14 weeks. Later the Multi Engine Advanced Rotary Wing course follows, involving 77 hours flying and 40 hours in the simulator over 38 weeks. Group Captain Brown emphasised that a war-fighting ethos applies throughout the training. Some 3471 personnel (including those from overseas) have been trained by DHFS between 1997 and 2009. Answering questions, the Chief Flying Instructor, Wg Cdr Andy Lovell, said that aptitude testing is now very good and the failure rate is only about 5%, and such students often go to the multi engine fixed wing fleet or to Air Traffic Control.

The Guild party were then divided, half visiting 705 NAS and the others 660 AAC. Lt Cdr Mark Scott, CO of 705 Naval Air Squadron, briefed us in more detail, describing a single service naval ethos within a multi service training environment – ‘teaching the art gained by experience’. The instructors in 705 NAS come from all three services and the group were given a tour of the Squadron by Lt Rich Maclaughlin. Meanwhile the other group were with 660 AAC, and some had the privilege of brief local flights. A buffet lunch followed during which the Master was



RAF Shawbury, home of the Defence Helicopter Flying School.

Squirrel helicopters on the Shawbury flight line.



pleased to present Master Air Pilot Certificates to two of the instructors, both with impressive records in service and instruction; Squadron Leader Alistair Reid and Mr Anthony (Tony) McGregor.

Finally, Flight Lieutenant Simon Kovach, second in command of 60 Squadron RAF, briefed us on the Multi Engine Rotary Wing course. The instructional staff are 48 in number, training 90 students, and using some 6,900 hours per annum on the Griffin. He also touched on the squadron's distinguished history, including such famous WW1 pilots as Albert Ball and James McCudden, and later service in Burma, Malaya and Germany. Then it was time for the ever patient and efficient Flying Officer Kenny Docherty to escort us back to Shrewsbury and our cars. We must record our thanks, again, to Group Captain Brown and his staff for a most interesting day. 🛩️



The Master presents Master Air Pilot Certificates to Alistair Reid (left) and Tony McGregor (right).



The Guild visitors at 60 Sqn.

Sir Alan Cobham Lecture - 29 April 2009

Helicopter Operations in Iraq and Afghanistan

Rear Admiral Tony Johnstone-Burt OBE MA FRAeS FCIPD

I have been intrigued by Sir Alan Cobham. He was clearly a man who was every inch a natural aviator, with masses of luck and charm (which doesn't necessarily always come free with the flying gloves), who thrilled a demoralised post-First World War Britain in the 1920s and 30s with his 'Flying Circus' aerobatic displays all over the country.

As you know, he became an international celebrity with his Air Races and extraordinary long-distance flights in an experimental flying boat where he flew from Rochester to London - but via Australia. On his return, he landed on the Thames in front of the Houses of Parliament before a crowd of a million people who thronged the bridges and embankments to see him.

But what I found really exciting about him is that as far as aviation was concerned, his imagination knew absolutely no limits. He really was prepared to push the envelope as far as it could possibly extend, and had the skill, courage, energy and enthusiasm to follow his instinct and explore what was then a completely new dimension for most of the world's population.

Was Cobham's extraordinary pioneering spirit combined with his unique flying skill an anomaly and did it die with him? Or has his inspirational example survived for nearly one hundred years and can we still see it today living on in our young military aviators?

JHC

As I'm sure that you're aware, with 15,000 personnel and about 400 aircraft, the Joint Helicopter Command comprises the Battlefield Helicopters in all three Services and a potent Air Assault capability in the shape of 16 Air Assault Brigade, the largest Brigade in the British Army. The JHC has been on continuous operations since its inception in 1999

having emerged as a consequence of the Strategic Defence Review.

However, having cut its teeth in Bosnia and Sierra Leone, the JHC has really come of age since 2003 through operations in Iraq and Afghanistan.

Thanks to Iraq and Afghanistan, we have moved from operating in a relatively predictable operating environment and now find ourselves fighting in an increasingly complex battlespace in a myriad of dimensions, which are riven with paradoxes and moral dilemmas.

In December 2007 an American academic called Frank Hoffman wrote a paper called *The Rise of Hybrid Wars*, where he tried to capture the complexity of our current operations. He says:

'Hybrid Wars are polymorphous by their nature as are their protagonists. Using both states and a variety of non-state actors they incorporate a range of different modes of warfare including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder.'

Its chief characteristics are simultaneity, convergence and combinations.'

Our own Defence Centre for Doctrine and Concepts has given it a more succinct definition:

'Hybrid War is a form of conflict involving a range of enemies (conventional, irregular and terrorist) who will employ all forms of war and tactics, perhaps concurrently and contiguously.'

Consequently, together with all three Services, I am in the process of configuring the Joint Helicopter Command to become masters of Hybrid Operations in order to combat the Hybrid Warrior as effectively as we can, both today and in the future.

Background

Ten years ago we operated our helicopters highly successfully, but in a rather set-piece, formulaic way. The success of which was reinforced by either highly focused humanitarian relief operations, such as our support to the Pakistan Earthquakes in October 2005, or in Operation BARRAS, the Special Forces assault on the West Side Boys in Freetown Sierra Leone in the summer of 2000 to rescue the Royal Irish Rangers who'd been taken hostage. Or indeed, the 2003 Gulf War which, relatively-speaking, was a straightforward example of high-intensity conventional warfare, and over quite quickly.

In Bosnia, we operated as three distinct and separate helicopter forces with overlapping areas of operation and conflicting priorities, but with some success in spite of those constraints. However, as you can imagine, the time spent planning the deconfliction of friendly forces through a highly bureaucratic daily air tasking order (the size of a telephone directory) and then doing it practically as an emergency as conflicts emerged in reality, reflected an extremely dysfunctional and inefficient organisation, especially when operating in single-Service stovepipes.

The true value of operating Jointly, came very clear in Iraq with the establishment of Joint Helicopter Force (Iraq) which is based at Basrah. JHF(I), as it still known, and I was in Basrah only yesterday, was operating a combination of RAF Puma, Merlin Mk3s and Chinooks, RN Sea Kings, and RN and AAC Lynx from the same airfield, with common operating procedures, a single point of command (rotated through each Service) and all sharing the same accommodation, briefing, engineering, eating and relaxing facilities. And all working directly for the British General in command of the region, via the Brigade Commander

and embedded with their staffs.

Again, it seems a 'Blinding Glimpse of the Obvious' but in one fell swoop it created a unity of effort and a clarity of command whilst capitalising on the mix of capabilities needed by the Land Commander, as well as preserving the single-Service ethos and different perspectives of the aircrew flying their respective aircraft type.

The RAF's doctrinal mantra of 'Centralised Command for Decentralised effect' holds absolutely true for the Joint battlefield helicopter operational and non-operational output of the JHC, with a Joint force in theatre, and a co-ordinated and unified Joint command at home.

In short, the intense operational tempo, combined with the requirement to deliver a broad range of aviation capabilities, could not be achieved without the Joint Helicopter Force, and our output is certainly greater than the sum of the individual single-Service parts.

But back to Hybrid Warfare

What we've currently labelled Hybrid Warfare is certainly not new, it's just different. You could argue that the British faced a hybrid threat at the turn of the last century in South Africa when the Boers' Mauser rifles and Krupp field guns outranged the British Red coats, and it proved almost impossible to dislodge the Boers from their dug-in positions.

In Afghanistan we're talking about an increasingly sophisticated enemy with the backing of a highly efficient international financial organisation and operational structure. Dressed in his traditional robes and sandals, in the morning he can be found in a cave conducting info operations through cyberwarfare with the latest laptop computer, by hacking or streaming video images of IEDs blowing up our troops and vehicles to mobile phones across a significant range to the wider population.

And in the afternoon the same man is conducting medieval warfare beheading village elders with a carving knife or using women and

children to shield him and his mortar crew from the Apache's weapons. Last month a man brought his 7 year old daughter into one of our Forward Operating Bases with a severe gunshot wound. She'd been shot by the Taliban specifically to trigger the launch of the Immediate Response Team Chinook so as to ambush the aircraft as it arrived to pick up the child and take her to our hospital in Bastion.

So what we're seeing is an enemy who fuses what he can in terms of technologically advanced systems into his force structure and strategy, and uses them in ways that are beyond their intended employment parameters. By blending and fusing all forms of warfare in this way, he can generate increased complexity, compound the threat and deploy his arsenal in a simultaneous way that can stretch and dislocate our forces.

So how are we combating the Hybrid Warrior with our aircraft in Afghanistan and Iraq?

I believe that Battlefield Aviation provides the perfect antidote to the Hybrid Warrior.

The defining aspects of battlefield aviation are its inherent flexibility and adaptability, which encompasses the ultimate in utility, but also agility, reach and potential lethality. All of which are aspects currently attributed to the advantages possessed by the Hybrid Warrior.

A key aspect of this is our ability to deny the enemy the advantages and safe-havens provided by dense urban terrain, where currently he can exploit the density of population, transportation networks, public services and local infrastructure, and hide, plan, rehearse and escape from allied forces at will.

Similarly, the enemy is seeking to deny us our objectives by disrupting our freedom of action, denying us access, preventing us from intervening successfully and driving up the costs of our intervention.

However, our ability to swing from operating in the urban metropolis and

follow the enemy into the desert, jungle, mountainous or maritime domains without having to reset our forces either conceptually or practically is the way that we are staying ahead of him and retaining the initiative.

Consequently, we are configuring our forces with the specialist capability required to anticipate and adapt our tactics in order to pre-empt and prosecute the enemy, as well as the generalist skills to enable our forces the maximum mobility, speed and force protection. But to do so, we need to ensure that this range of capabilities are able to be deployed either independently, or as a co-ordinated force with other enablers, and always fully integrated with the land force that we are supporting.

Joint Helicopter Forces should be fully capable of providing real-time intelligence collection, surveillance and reconnaissance (or ISTAR) to ground forces whilst also being confident in their self-protection from small-arms, Rocket Propelled Grenade or manpads attacks. However, they should be capable of swinging from the ISTAR role into either an interdiction or attack role, a troop carrying role or, indeed, perform Provincial Reconstruction activities or humanitarian operations.

The four broad categories of Light Utility, Find/ISTAR, Attack and Lift have been key in presenting a menu of choice for the Land Commander. However, as the sophistication and complexity of the threat in both Iraq and Afghanistan have increased, so the tasking of our aircraft and demands on our aircrew have had to keep pace. The boundaries between them have blurred and their spheres of influence or effect now overlap.

Light Utility

Using helicopters in the Light Utility role to move unit commanders and personnel around the battlefield is and will remain vital. It is fundamentally all about connecting people up. As Rupert Smith has said, in wars which are set 'amongst the people' the ability to move small groups of people quickly and in safety is critical. The

Regional commander may need to speak to the Governor or Ambassador, or a small specialist team may need inserting.

During the expulsion of the Shia militias from Basra last year, it was as important to fly our General to meet members of the Iraqi government face-to-face, as moving detainees around the battlefield, and also use the Lynx for airborne interdiction operations against vehicles and insurgents.

Another Light Utility role that has proved invaluable is that of providing a presence on the Iranian border. The Lynx provides a potent visible presence, but not one as threatening as the Apache Attack Helicopter. The visible patrols of the vital oil pipelines have been equally effective at deterring attacks on this critical infrastructure.

The utility helicopter has been a priceless workhorse, connecting people, protecting people and, in short, making things happen. This potentially unsung hero of Iraq and Afghanistan will always have a place on the Hybrid Battlefield. As I've said, our enemy will always try to separate us and pick us off. The utility helicopter is the glue that allows us to cohere, get things done and outflank him.

ISTAR and FIND

The ISTAR and Find roles are closely linked to the Light Utility helicopter but, as I mentioned earlier, they are now examples of capabilities that are utilised by all of our helicopters.

The Lynx is currently used to ride 'shotgun' over our vulnerable logistics or troop convoys or provide 'overwatch', relay a real-time video data stream to the ground commander of the enemy manoeuvring amongst a crowd in a market square, or by loitering at several thousand feet above a threat area, establish a 'pattern of life' for suspected insurgents without them knowing.

All of which are lessons that we learned during our operations in Northern Ireland. Sea Kings, Merlins, Lynx and the Apache are all used to

gather intelligence and gain an edge over the Hybrid Warrior.

But key to the Intelligence collection, surveillance and recce role is blending it with the formidable loiter capability of UAVs. And capitalising on the fact that whilst a helicopter can't hang around for as long as a UAV, it provides the ground commander with a 'man in the loop' and possibly more importantly 'eyes and a sensor on the target'. In other words, someone who can give you a first hand view of what is happening with his or her own interpretation. It also gives him the opportunity to place one of his own sub-unit commanders in the aircraft to command the operation.

ATTACK

Then there is the attack function, where helicopters have probably demonstrated the greatest flexibility. We bought the WAH-64D Apache to destroy the large armoured formations of the Third Shock Army as they rolled across the West German Front, and our experience in the First Gulf War seemed to confirm that requirement.

Yet no sooner had the aircraft started to enter service than we deployed them to Afghanistan with the Paras in 2006 as part of 16 Air Assault Brigade, and they performed magnificently in the Close Combat Attack role. They used the same capabilities but in a different tactical setting, and now provide a perfect example of the inherent flexibility of aviation that I was talking about earlier.

In Afghanistan the Apache's ability to loiter menacingly, and bring its Hellfire missiles, rockets and 30mm cannons to bear on the enemy, but within yards of our own forces have struck fear into the hearts of the Taliban.

So whether the Apache is used for ISTAR, an escort of both ground forces or troop-carrying helicopters, to suppress enemy air threats, or in providing CCA, the Attack Helicopter is already a battle-winning capability. Currently we have nine Apache which are delivering 500hrs of activity per month in support of ground forces, 24hrs a day, seven days a week on an enduring basis.

LIFT

Then there is Lift, usually divided into medium and heavy lift. The lift of troops in safety and the rapid replenishment of supplies will, and always will be, critical capabilities.

Our Merlins in Basrah, Pumas in Baghdad, and Chinooks and Sea Kings in Afghanistan allow us to deploy troops over a wide area with much less force protection than we would normally allocate. This capability, its speed and flexibility, and specifically the force protection that it provides against IEDs, which is increasingly the insurgents' weapon of choice, will become an even more important factor for allied forces, whether US, UK or other nations.

Every Task Force Commander in Helmand, sees the Chinook as particularly important in maintaining the operational tempo of his troops and preserving their ability to manoeuvre swiftly and unexpectedly in order to keep a step ahead of the insurgents.

CASEVAC

Another key area, which is something of a cross-over between light utility and lift, is medical evacuation; CASEVAC, MEDEVAC, FAME or DUSTOFF are just a few of the many abbreviations that we use for it, but all signify a critical role which has correctly come to dominate operational planning.

In the UK we rely on nominating a particular platform, rather than a role specialist aircraft as the US do with their Blackhawks. In Iraq we use Merlins, which have an Immediate Response Team (IRT) comprising a trauma specialist and paramedics, with all their kit loaded or at very short notice; in Afghanistan we use Chinooks, but both aircraft offer plenty of space to operate.

With modern sensitivity to casualties, and our increasing and correct moral duty to get casualties to care as quickly as possible within the 'Golden Hour', our helicopters are genuine life savers, something that the US pioneered in Vietnam and which has been improved gradually on every campaign since. To so many of our

soldiers injured in Afghanistan and Iraq the CASEVAC helicopters and their dedicated medical crews have literally been 'angels from the sky'.

Finally, how do we pull all these capabilities together in theatre?

Very broadly, we conduct two forms of operation. One is called Framework or Sustainment Missions and the other is the more aggressive Deliberate Operations.

The Sustainment Missions represent 60% of our flying and comprise the transport of troops, food, ammunition, water and fuel to Forward Operating and Patrol Bases across the Region. Sustaining our troops in the field is clearly critical to their survivability in terms of keeping body and soul together physically as a matter of routine, as well as helping them to survive and defeat the enemy.

Deliberate Operations are much bigger, challenging, far more aggressive and require extensive planning. They focus on delivering the Commander's plan across the whole Region and involve the use of air assault and heliborne troops in either a large Commando Raid or Air Assault operation.

Over the last few months in Afghanistan we have conducted numerous 'intelligence-led' Deliberate Helicopter Air Assaults and Commando Raids with the Afghan National Security Forces, the UK-led Helmand Task Force, Close Air Support Harriers, Chinooks, Apache, Sea Kings, Lynx and other ISTAR assets. This involved up to 15,000 troops clearing and securing large areas of Helmand from Taliban influence.

One of the largest of these operations was Operation 'Red Dagger' which took place over a three-week period last December. This was the largest operation undertaken by 3 Commando Brigade, during their tour in Afghanistan and also involved Afghan, Danish, Estonian and US Forces.

The success of this mission helped to extend the authority of the legitimate

government of Afghanistan, and provide stable conditions for the local population to begin the Voter Registration process for the Presidential elections which will be held this August. Several tons of narcotics were destroyed, along with the seizure of a large quantity of weapons including rocket propelled grenades and mortar rounds. This mission alone provided a genuine boost in security for over 70,000 people for the central area of Helmand.

Conclusion

I wanted to give you a flavour of the extraordinary change in warfare that we're witnessing across the world, and in Afghanistan in particular.

Hybrid Warfare is what we're calling it today, and I daresay that there will be another catchy label tomorrow! But the academic Michael Evans probably describes it most succinctly as 'wars in which Microsoft coexists with machetes, and stealth technology is met with suicide bombers.'

I've told you that battlefield aviation, and specifically the dynamism created by helicopters, has become a mission critical capability for the Land Commander across the full spectrum of operations, from humanitarian relief and stability operations, through Counter Narcotics and Counter-Insurgency operations, to full scale warfighting.

Hybrid Warfare now demands that we do all this at the same time.

At one end of this scale, we need to resource and train our Joint Helicopter Forces with our Land Forces to maximise the Land Commander's capacity to generate 'tempo', seize the initiative, take the battle to the enemy and, if necessary, dislocate and destroy him as swiftly and decisively as possible. He needs to be able to capitalise on fleeting opportunities, exploit advantage and surprise, and maximise his force's mobility and manoeuvre.

At the other end of the scale, we also need to ensure that all those on operations really understand the enemy that we're fighting, culturally, linguistically, anthropologically and psychologically.

Sun Tzu was right 2,500 years ago, when he said:

'Know your enemy and know yourself; in a hundred battles you will never be in peril.'

But to do this simultaneously we, across the whole of Defence, need to configure ourselves differently and invest in a broader approach to our preparation for operations which balances our investment in training with far more education, especially in the languages and cultures of the nations that we're trying to help.

In short, in terms of aviation, I want to create a situation where all our helicopters are seen simultaneously as beacons of hope and saviours in the eyes of our troops and the local population on one hand, whether delivering humanitarian aid or medical evacuation, yet at the same time, capable of swinging into a troop-carrying or attack role and striking terror in the hearts of our enemies.

And I know that I've got the people across all three Services who are ready and able to step up to the plate and take on that challenge for me.

Now, the challenge that I set you at the start was to ask you if you thought that Cobham's extraordinary pioneering spirit and bravery have lived on in our young people today.

Now, what would Sir Alan think? 

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