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THE HAWKER ASSOCIATION

NEWSLETTER NUMBER 16 - SPRING 2007

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EDITORIAL

This Spring edition brings you a wide range of subject matter: from competition gliding to a civil Harrier, from Egypt to Greece, from racing yachts to restored biplanes. It all proves how wide ranging was the work and interests of 'Hawkers' and its people.

Thank you to all the contributors of news or memoirs; it is these that make the Newsletter unique. Please keep sending them in as I have published pretty well all the backlog and need your inputs for the Summer edition.

Included is the Annual General Meeting Notice and the 2007 subscription payment form. Our Secretary has been assiduous in sending the latter only to those whose subscriptions are due. Some 2006 subs. are **still unpaid** - see names in bold on Members list. Please pay promptly as it saves him (and me) a lot of work in reminding those who have forgotten...please!

Write to: The Editor, Chris Farara, at 24 Guildown Road, Guildford, Surrey, GU2 4EN.

PROGRAMME FOR 2007

Wednesday 14th March	"The Tripartite Evaluation Squadron" - **Air Cdre David Scrimgeour**.
Wednesday 11th April	AGM with video.
Wednesday 9th May	"Anything but Aircraft - the role of the Prison Chaplain" - **Revd Vernon Lidstone**.
Wednesday 13th June	Summer Barbecue**.**
Wednesday 11th July	"Joint Force Harrier Operations from Cottesmore" **- Cdr Adrian Orchard**.
Wednesday 8th August	Social with video.
Wednesday 12th September	Social if visit arranged for September
Wednesday 10th October	"My Third Job in the Front Office - **Chris Roberts**
Wednesday 14th November	"Fifty-three Years of Flying" - **Clive Rustin**
Wednesday 12th December	Christmas lunch

Unless stated otherwise, meetings are at the Hawker Centre, Kingston - the old Sports & Social Club - and start at 2.00 pm. Lunch and drinks are available beforehand, tea afterwards, and there is a large, free car park.

David Scrimgeour was the CO of the Kestrel Evaluation Squadron so will talk to us from first hand experience. **Vernon Lidstone** was Kingston's Commercial Director, retiring from business to become ordained and has worked for 15 years in the Prison Service. **Cdr Adrian Orchard** is the CO of 800 NAS at Cottesmore and **Clive Rustin** is best known to Hawkers through his test flying work at RAE Bedford and the A&AEE

RAF CLUB CAMM MEMORIAL

On 27 February the Sir Sydney Camm bronze was unveiled by Elizabeth Dickson, Camm's grand-daughter, at the RAF Club in Piccadilly. Addresses were given by Duncan Simpson, who initiated the project with the RAF Club on behalf of the Association, and Ambrose Barber, our Chairman and sculptor of the bust. Below the bust, and presented by the Association, is a large picture frame mounting photographs of Camm's most famous RAF aircraft, a list (with numbers built) of all his designs, biographical details and a photograph of the young Camm at Windsor. The Association also contributed to the cost of the bust. This all sits beside a similar bust and display for RJ Mithell and his Spitfire. Honour is satisfied. Richard Cannon took a video of the event which will be shown at a later meeting.

HARRIER NEWS

RAF Harrier GR7As at the NATO airbase at Kandahar have been in the forefront of NATO air support operations in southern Afghanistan, dropping 91% of all air weapons used by alliance combat aircraft during September 2006. A pair of Harriers is kept on 24-hour alert, ready to respond at short notice to help NATO troops under threat. Weapons used by the seven Harriers of IV Squadron RAF include Bristol Aerospace CRV7 rockets, Raytheon Enhanced Paveway 2 laser/satellite guided bombs as well as standard 540 lb and 1000 lb free fall bombs. Munitions are flown into Kandahar by RAF C-17 transports. Flown in pairs the Harriers now usually carry on one aircraft two 1000 lb Paveway 2 bombs and on the other two CRV7 pods, two 540 lb bombs and a reconnaissance pod to photograph Taliban positions. No. IV Squadron RAF completed its tour in early October and handed over to the first Royal Navy GR7A unit, 800 Naval Air Squadron. No.1 Squadron RAF will return to Kandahar in early 2007 with higher performance Harrier GR9As.

The Harrier GR9 and T12 were formally accepted into service, by Assistant Chief of the Air Staff, Air Vice Marshal Chris Moran, at a ceremony at RAF Cottesmore on 10 October 2006. This followed the delivery of 24 GR9s and one T12 out of an eventual total of 60 GR9s and 9 T12s, under contracts worth more than £500 million.

F-35 FLIES Lockheed-Martin CTP, John Beesley, completed a 40 minute first flight in the CTOL F-35 Lightning II on 15 December at Fort Worth, Texas. BAES supplies the rear fuselage and tail unit and several aircraft and avionic/computer systems.

HAWK NEWS

The UK Defence Procurement Agency has awarded BAES a £450 million contract for 28 Hawk Mk.128 Advanced Jet Trainers for the Royal Air Force and the Royal Navy. Also covered is the provision of initial spares, support and test equipment, technical documentation and conversion training for both pilots and groundcrew.

BAES has submitted a proposal under the Hawk Integrated Operational Support Programme to support the current RAF Hawk fleet until the aircraft are taken out of service.

The second batch of Hawk Mk.129s for the Royal Bahraini Air Force was officially accepted on 10 November 2006. Also accepted was the complementary training system comprising a fixed base simulator and avionics part task trainer. The first two (batch one), aircraft, BT003 and BT004 started flying operations at Shaikh Isa Air Base on 1 November, achieving 56 flying hours in three weeks.

The South African Air Force (SAAF) formally received its first batch of eleven Hawk Mk.120s at Makhado Air Force Base close to South Africa's northern border. Also inaugurated there was a new Hawk Training Centre at 85 Combat Flying School which operates the Hawks. Co-located is 2 Squadron, the SAAF's fighter unit due to receive Gripens. The total SAAF Hawk order is for 24 Mk.120s. In December four Mk.120s made the type's public debut at Cape Town's Africa Aerospace & Defence 2006 exhibition at Ysterplaat Air Force Base. The two Hawks were flown by SAAF test pilots Major Jannie Scott and Capt Peter Chaplain.

BAES has delivered the 200th T-45 Goshawk fuselage and wing to Boeing, St Louis. The 200th aircraft is scheduled for delivery to the USN in March. Orders to date are for 211 aircraft with a further 12 expected to be ordered in 2007, securing production until mid 2009.

The next generation of flight operation software, OFP4 (Operational Flight Programme 4) is currently being evaluated in Hawk Mk.128 development aircraft ZJ951. On a recent flight to the UAE the system performed flawlessly. This is a very important step towards the production standard OFP5.

The first of 66 Hawk AJTs (HT001) for India has flown at Warton with CTP Keith Dennison at the controls. The first 24 are being built at Brough and 42 are to be manufactured under licence in India by Hindustan Aeronautics Ltd at Bangalore. Delivery of fuselages, 1,500 tonnes of raw materials, 3,500 tools and 15 million components is well under way. The first, UK built, aircraft will be delivered to India in September 2007 and already 40 Indian Air Force pilots have completed interim pilot training provided by BAES at RAF Valley.

HAWK vs GOSHAWK FOR GREECE

Boeing is competing with BAES for a Greek Air Force contract to replace their T-2 Buckeye trainers. Boeing are offering the upgraded T-45C Goshawk with the Adour 951/F405-RR-402 engine, FADEC (full authority digital engine control) and hot section life increased to 4,000 hrs from 2,000. The VMTS (virtual mission training system) allows virtual radar, weapons and network-centric operations training. The T-45C for Greece would still be built to naval strength standards, and therefore, carries a weight penalty.

BAES offers the advanced Adour 951 powered Hawk 128 AJT as ordered by the RAF. This is the new baseline variant for the export market. The aircraft has the very latest navigation and avionic systems and new mission computers allowing the integration of new systems and capabilities such as autopilot, ground proximity warning, traffic collision avoidance and moving map. It will also allow a full suite of simulated weapons and sensors for operational training.

As an interim measure Greece is also looking at the NFTC (NATO flying Training in Canada) scheme which uses Hawk 115 aircraft. This experience could encourage the Greeks to favour the BAES option.

Whichever way it goes, Kingston wins again!

SEA HARRIER SET TO FLY ON

Art Nalls, the new owner of Sea Harrier FA2 development aircraft XZ439, originally the second development FRSMk1, writes, on 27 December 2006, about his plans for its future...

I am a retired Marine Corps pilot and now the proud owner of XZ439. As a former squadron maintenance officer I was aware of what a rare find this aircraft was when I first laid eyes on her. She's in great shape! I've honestly flown much worse aircraft over 200 miles of the Indian Ocean and had to find my way back to a grey ship in grey sea. There is absolutely no doubt in my mind that this aircraft will be flying again very soon.

To that end I've assembled a cadre of experienced Harrier maintainers and am collating a good supply of spares, support equipment etc. Since the airplane is certificated as 'Experimental' in the US I have great latitude with modifications and can do almost anything to the airplane to make life simple. I've modified the hydraulic and nitrogen connectors to be compatible with US standard, removed almost all the military equipment and will install civilian radios, and even a civilian EFIS (electronic flight information system) to replace the HUD, which all work on 28 volts DC rather than the AC that the generators provide. XZ439 is no longer a 'weapons system' but an airshow demonstrator. We'll add the gun pods to house a smoke system feeding the rear nozzles. I can imagine what a dramatic effect a 'flop' will be since the smoke will rotate with the nozzles.

I have no shortage of experienced pilots willing to offer their services to fly my 'plane for me; as if I needed help to fly it - but one day I might. I have operational experience in the AV-8A, was a test pilot for the early AV-8Bs and project test pilot for the TAV-8B. I also have over six hours of flight time in Harriers and Skyhawks <u>without</u> the engine running (during air-start testing), hundreds of shipboard landings and was a test pilot for Harrier trials including high angle-of-attack tests, weapons tests, asymmetric take-off and landing tests, and shipboard ski-jump tests. I was fortunate to hit the programme when everything needed to be explored and we only had three pilots to do it all.

XZ439 has successfully passed the FAA airworthiness inspection and the Certificate will be formally issued on 10 January 2007. It has been assigned US civil registration N94422 and only needs one more piece of paper before it is legal to fly again. That is the Letter of Authorisation to begin actual flights, and I expect that within a month. I have the second of two simulator sessions on 29 December.

Non-believers become converts as soon as they see the actual airplane. As you might imagine, the Marines are also quite excited about this; so much so that the volunteer maintainers have sentenced me to a chair with my hands duct-taped and I'm not allowed to touch my own airplane, except in an 'official' pilot capacity. The airplane is ready, the team is ready and I'm ready!

Our concept is to fly the XZ439 to a select few airshows in 2007, all within one short flight leg of home base which is St Mary's Airport, just outside NAS Patuxent River, Maryland. The following year we'll expand our operations to shows outside that short radius, to the west coast for example, by shipping the airplane, dismantled, on two flatbed trailers. This does a couple of things: it preserves valuable engine time, it is not weather dependent, and is probably cheaper than flying. The Harrier is not the most fuel efficient aircraft, especially when I'm limited to an altitude of 17,500 ft and visual flight rules (VFR) conditions. I doubt I'll ever need the windscreen wiper again!

Editor's Note. In answer to some questions raised by the above, Art sent the following.....

I was a military test pilot at Pax River, having graduated from the USAF Test Pilot (TP) School with Class 85A. At that time the new AV-8B was being introduced and there was no shortage of work. In fact, I had been offered a TP job Edwards AFB while a student there but Marine Colonel Harry Blot, my former CO, told me in no uncertain terms that if I accepted a job testing for the Air Force I was to stay there and never come back to the Marines; I had been sent to Edwards to become a qualified TP so had better get back to work for the Marines!

I was the project officer for the ski-jump testing aboard ship. The first ship was the Italian Navy Garibaldi, with a 6 deg ramp, designed specifically for Harriers. The ship must have been designed by someone who had never actually been aboard a fighting ship - centre deck elevators, centre hangar bay with passages round the outside, fuel lines running round the ship perimeter, no deck-edge scuppers and no lights - but it does look good! Anyway, we did the tests and provided the launch bulletin for them. The second ship was the Spanish Navy Principe de Asturias with a 12 deg ramp. This had a much better configuration being based on the unbuilt US designed Sea Control Ship sponsored by Admiral Zumwalt, USN.

The ski-jump so impressed me that I authored several technical papers and was a huge advocate for the USMC to push the USN to install it in our amphibious ships (LHDs). We could then use the single flight deck as essentially two runways; the helos launching from the stern, the Harriers from the bow. There is nothing that can be loaded on a Harrier that it can't take off with from 400 ft with 15 knots wind over deck - absolutely nothing - and the flight deck is 800 ft long on the LHDs. Doubled take off performance, increased inherent safety from the launch trajectory and no moving parts. Seemed like a no-brainer to me but the USN didn't want to jeopardise their big deck carriers. I even attempted to orchestrate a cross-deck operation with the Russian ski jump ship Tiblisi.

Towards the end of my flight testing career I conceived and got official approval to take a test team to Russia to explore the YAK-141 supersonic VSTOL fighter and to fly and report on the YAK-38 Forger. I was the first western TP to do this.

Editors Note. I'm sure I speak for all Hawker Association Members when I wish Art the very best of luck in this exciting and ambitious project. Who knows; one day we may see him and XZ439 doing a season of UK and European airshows. What a thrill that would be!

✍ TYPHOON ENTENTE CORDIALE FUND

During the battle of Normandy in 1944, eighteen Typhoon squadrons supported the British and Canadian armies. In the ten week campaign 50% of the aircraft and 40% of the pilots were lost. The grateful French population formed the Association pour le Souvenir des Ailes de la Victoire de Normandie (ASAVN), built a magnificent Typhoon Memorial at Noyers Bocage, located crashed Typhoons and buried the pilots with full military honours. The marked graves are beautifully cared for and tended in some cases by young children. At the heart of these efforts has been M. Jacques Brehin, President of the ASAVN, and his team.

Surviving Typhoon pilots wish to provide the French with a memorable 'thank you' occasion. To this end David Ince, who gave us an outstanding talk on his wartime Typhoon experiences (see NL.5), is the Chairman of the Typhoon Entente Cordiale (TECF) fund, raising money to pay for an event at Middle Wallop on 23 May (including a Eurofighter Typhoon flypast), to cover travelling costs of the French guests and to set up a bursary for French youngsters. Sponsors are being sought but individual contributions would be very welcome.

Please send your cheques payable to the TECF at 4 Rawson Court, Sea Lane, Rustington, West Sussex, BN16 2SD.

TYPHOON AND TEMPEST ASSOCIATION

Ken Rimmell, who founded the Association in 1982, writes...

If any Hawker Association Members who flew, built or worked on either Typhoons or Tempests would like to join this year's Typhoon and Tempest Association get-together near West Wittering in West Sussex on Saturday June 3rd, would they please contact me at <ken.rimmell@btopenworld.com>, or phone 07884 195259 or write to 1 The Glade, Pagham, West Sussex, PO21 4SD. There is a bar and lunch can be pre-booked at £8.

OLD HAWKER AIRCRAFT NEWS

Barry McKee reports that a Sopwith Dolphin is being restored by the RAF Museum at Cosford, a Tempest II is being rebuilt to flying condition in Lincolnshire, a Demon is being similarly rebuilt at Sandy, Bedforshire, and work continues at Duxford on the Fighter Collection's Sea Fury. Hawker Restorations in Sussex expect to complete and fly Hangar 11 Collection's Canadian-built Hurricane IIB 'Hurribomber' in 2008.

RESTORED HAWKER NIMROD FLIES

Sarah Pepper, PA to Guy Black of the Historic Aircraft Collection (HAC), reports that their Hawker Nimrod II (G-BURZ) completed its first post-restoration flight at Duxford on 16 November 2006. The uneventful flight lasted 20 minutes and the aircraft performed faultlessly.

This original aircraft was discovered on a dump near Ashford, Kent, and is thought to have been damaged in extensive raids on nearby Lympne airfield where it was probably in use as an instructional airframe at the Fleet Air Arm Engineering School early in WW II. The restoration took some twelve years to complete and was described as challenging. The Nimrod II is a far more complex aircraft than the Nimrod I, an example of which (G-BWWK, exchanged with The Fighter Collection at Duxford for their Hurricane G-HURI)) was also restored by HAC's restoration arm, Retrotec Ltd. The Mk II differs mainly from the Mk I in having swept upper wings, an air-start system allowing off-base operation, and a more powerful Rolls-Royce Kestrel engine with a highly complex steam condensing

cooling system. Many parts had to be remade at great expense, including 6.00 X 19 balloon tyres specially commissioned from Dunlop Aviation; this will benefit other Hawker biplane rebuilds.

The Nimrod II will be appearing at airshows in 2007. To book contact HAC at <hac@aerovintage.co.uk>

RESTORING HAWKER BIPLANES

With Historic Aircraft Collection (HAC) founder Guy Black's permission, the following piece is based on an article on the HAC website.

The Historic Aircraft Collection was formed by Guy Black and Angus Spencer-Nairn to restore and operate a collection of piston engined military aircraft. Currently their fleet comprises Hurricane Mk XIIa (G-HURI), Spitfire Mk Vb (G-MKVB), a Feisler Storch, a Chipmunk and an L4 Grasshopper. Behind the scenes a lot of restoration work is taking place including a number of single and two-seater Hawker biplanes. HAC's sister company, Retrotec Ltd (formerly Aero Vintage Ltd), responsible for restoration work, completed their first restoration, Hawker Nimrod I (S1581) in 2000, and a Nimrod II (G-BURZ/K3661, see above) in 2006. A Fury I (G-CBZP/K5674), a Hind (L7181) and an Audax (K5600) are currently in work..

Aircraft from the first world war period were usually wooden framed, wire braced and covered in linen fabric. Aircraft produced in the 1930s were of transitional construction where the wooden frame was replaced by one of tubular steel or, as was to become more common, sections made from formed rolled steel strip. High tensile steel was used so very light, rigid structures could be made. The problem that restorers of aircraft of this period face is that steel corrodes and being so thin is almost always unusable a second time around. Fortunately the plates at all the junctions were made of stainless steel and these mostly survive in good order, but the tubes and spars usually need to be replaced.

The Hawker biplanes had faceted wing spars of polygonal cross section made of rolled steel strip, closed and riveted together, with a high tensile steel web separating upper and lower booms. The machine used for making the booms is called a roll forming mill. Original specification steel for the spars was made for us by a Swiss company who arranged a unique smelt for Aero Vintage. The tubes of the fuselage structure had squared ends where the joint was made with stainless steel plates. It was an Air Ministry requirement that these aircraft should be easily maintainable in the outlying reaches of the Empire where welding facilities might not be available. The structure was therefore assembled with close fitting ferrules held together between the plates with flared mild steel tubular rivets. Nowadays neither the tubular rivets nor the high tensile steel strips or tubes are available from stock leading to a major development programme at Aero Vintage Ltd to manufacture the material and recreate machines to produce the sections exactly as were used by Hawkers. The squaring of the tube ends was done using a special machine. Using photographs of Hawkers' original machine Aero Vintage designed and built one, and the chance discovery of a set of squaring tools in a South African scrap yard allowed squared tube manufacture to be carried out. Other machines have been installed to manufacture the streamlined tubing used on the wing struts and to make the special tubular rivets.

Editor's note. Anyone who visits Retrotec/Aero Vintage cannot be but impressed by the high quality of the work carried and the attention to detail in every aspect of design and manufacture. Also noticeable is the quiet working environment; no whining 'windy' drills or chattering rivet guns. To those used only to stressed skin aircraft, the beauty of the tube and wood structures, recreated by their craftsmen exactly as was done at Hawkers between the wars, is most affecting. Just think what it must have been like in a factory filled with lines of these exquisite aeroplanes in peaceful series production.

EGYPTIAN CHAOS

Eric Hayward remembers a day on the outskirts of Cairo...

During 1976 I spent quite a time in Egypt on a task which was to organise supplies and servicing to keep 120 plus Egyptian Air Force MiG 21s flying. Not the best time of my life, as I had come direct from the clean efficiency of Switzerland to the dirty, disorganised chaos of Cairo; but it was one of life's more memorable experiences.

I recollect being parked in my car near one of the military bases just outside Cairo, idly watching the world go by, when I became aware of two army lorries, carrying a large group of soldiers, parked on the other side of the street. Presently the first lorry started up ready to move off, but the second lorry's battery was obviously flat so it would not start. All the soldiers disembarked and there ensued a lot arm waving and arguing, as only Egyptians can, which was eventually resolved by one of the soldiers doing something most unusual; making a decision. "Tow it to start."

A fairly short length of what appeared to me to be flimsy hawser was found and hitched between the vehicles. All climbed aboard and the front lorry moved off in a series of savage jerks. Having gone about 20 yards three things happened simultaneously: the engine of the second lorry started with a roar, the hawser snapped and lashed viciously around the second lorry's engine, breaking what I believe was the main petrol pipe, which burst into flames. This so startled the second lorry's driver that he just put his foot hard down and rammed the rear of his fellow traveller.

So we now had two lorries crashed together, on fire, with no fire extinguishers in sight; and dozens of panicking Eyptians, some shouting orders, others just running away. The latter seemed to be a good idea, so I left as well (when in Rome and all that). I never knew the outcome but...anything could happen in Cairo!

HARRIER - AND THE TIGER ON MY BACK

John Dale whose career ran from BS53 Development Engineer in 1959 to Chief Engineer Pegasus at his retirement in 1976, finally, on 31 August 1976, got to ride the engine he had been responsible for throughout its running life...

Ten years to the day after the first flight of the Harrier I was climbing into the cockpit of G-VTOL at Filton. John Farley (then Deputy Chief Test Pilot, HSA Dunsfold) had telephoned me: "You're dining with us on the 31st. We're coming to fetch you in a Harrier, OK?" I was to borne on my own hot air at last!

I had been kitted out, my helmet adjusted to suit my head, and I had studied Part 1 of AP 101B, Aircrew Equipment Assembly and Associated Systems. A bit complicated for an amateur, I thought, but it was good background stuff, and finally I had been briefed by John himself, with the quiet confidence he exudes.

So this was it. I settled myself in the rear seat which was adjusted for my weight; the leg restraint cords were secured and all the various clips and buckles made fast - what a positive audible click each one made as it snapped home. "A bit tight those shoulder straps" - "No good if they're too loose." The Koch fasteners rode on my sparsely covered collar bones - expect I'll soon forget them (but I didn't for a day or two).

Now the helmet and the mask; check the intercom. No go, I couldn't be heard (bloody electrics again, we say in the engine trade). New mask OK for sound, although, truth to tell, I never did succeed in finding the little switch for my microphone without a lot of fumbling (perhaps the mask is GFE? - Government Furnished Equipment).

Out come the little pins to be housed in the rack on the starboard edge of the cockpit. "The seat's live now, John..." The canopy is lowered and John Dale is in his own private world for a few minutes to look around at the workmanlike equipment of the cockpit - the stick much more rugged than I had expected; now I understand the pilots' expression "polling around".

"OK John?". I affirm, the GTS (Gas Turbine Starter) winds up and the RPM rise rapidly to 40% and beyond - ah, that's the HP (High Pressure compressor) tacho, which seemed to me better placed than the LP instrument which I should have been watching. JPT (Jet Pipe Temperature) satisfactory, IGVs (Inlet Guide Vanes) on the move; the rudder pedals move sharply as we taxy off.

So - end of the runway - "All set?". The throttle moves forward in one easy movement and within seconds the tiger leaps on my back. The seat urges me forward and my helmet is forced back against the head-rest. Almost at once the trundling of the undercarriage ceases, and the concrete drops away. We can't be going fast enough to be wingborne, but then, of course, we don't need to be.

We are boring our way into the overcast sky above the Bristol Channel looking for the Rolls-Royce Navajo - ah, there it is, and we creep up to formate wingtip to wingtip and wave to the occupants. Our nozzles are well down to enable us to fly at the 160 knots of the other aircraft. As Farley eases them aft the Harrier leaps ahead and the Navajo slides aft and is lost to view (not a good mirror, I thought - why not make it convex in the vertical plane as well as in the horizontal?)

Climbing to 5,000 ft we cut through the overcast and clouds and after only a few minutes Farley briefs me. "Six minutes from Dunsfold now, we'll just get into their radar pattern and then pop down to the South Coast." And now we pass over the coast, wheel to port with a cargo ship below our wingtip, and we head east a little way off-shore. "Will you take the stick now, John?", Farley instructs me, and I am in control as we fly smoothly at 350 knots, 1,000 ft above the sea. Brighton, Eastbourne and Hasings come up and vanish in quick succession under the port wing. The aeroplane responds so easily to my small stick movements and it is immensely exciting to feel the delicate response as we drop a little too low - stick back a fraction and up she comes: 800-900-1,000 ft again.

"Now we'll turn and run back." Farley takes charge and the aeroplane seems to stand on, and pivot about, the port wingtip, while I lose an inch or two of my height under the pressure of my helmet, and there we are, heading west.

Now an exercise in VIFF (Vectoring In Forward Flight). "First let's try a slam decel. to flight idle from 90%, 400 knots." The speed drops off. "You see, 35 seconds to 200 knots. Now up to 400 knots again, RPM at 90%, and let's put the nozzles down...now!" On the instant an aerodynamic all-Hell-breaks-loose as the huge momentum drag at the intake faces takes over, obviously well forward of the aircraft centre of gravity as the tail shows every sign of wishing to overtake the nose, and all but succeeds. The intakes spill and judder and the ASI (Air Speed Indicator) winds down rapidly, and in half the previous time we are down to 200 knots. That was indeed impressive. Nozzles back and all is peace again but for the reassuring whine of the Pegasus just behind me.

Now we are approaching Dunsfold again and we are into the return transition. With so many new experiences in a short time it is difficult to remember precisely, but I fancy I was controlling height during this transition. In the resulting hover I certainly was, and what a beautiful height control the engine throttle is. We seem to have just the right rate on that so-called Merewether cam in the fuel system, and hours of debate flash across my mind.

Farley lands us, and now for a VTO (Vertical Take-Off)...Slam the throttle, the aircraft lurches on the undercarriage, a momentary battle between thrust and weight, and we are off and moving forward into wingborne flight. And I have another flashback to that cold day in 1960 when Bill Bedford made the first VTO in the P.1127, at Dunsfold. Along the runway we tear, I miss Farley's brief in the excitement of speed, and suddenly we are all ends up with sky all over the place, including under my feet. "That was just a gentle roll. Are you all right, are you all right?" "I'm still here."

Again we come to the hover and now I take the stick while Farley watches the height. What a splendid operation the hover is; the response of the aircraft to the stick so delicate, so positive, yet not too rapid. There is a feeling of great stability and none of the horrible tentative feel one gets in a helicopter. "Can I land her?" I ask, but (thank God) my instructor chickens out and takes over as we sink to the ground. Slam back the throttle (it is nice to get the thrust off quickly) and my flight is over.

As we taxy off I recall the words engraved on the Harrier model presented to me by my Hawker friends: "We like to hear a continuous roaring noise." Well, the Pegasus roared satisfactorily, when I had time to notice it, as I flew and became, for a brief space of time, part of the fabulous Harrier.

Thank you John Farley and thank you Hawker.

This piece was originally published in the Roll-Royce house newspaper in October 1976.

HAWKER GRADUATE APPRENTICES - PART 2

Guy Harris continues his memoir...

Next stop after completing my degree in June 1960 was 'Progress'; I don't remember much about that so it can't have been very interesting! It was then that I got to know more of my contemporaries at Hawkers, those in my particular group of friends being Alan Boyd, Paul Boon, Chris Farara and Basil Maddox and we all used to meet up at lunchtime in the canteen and talk about cars (eg the brilliant new E-Type Jaguar, or Chris's involvement with Peter Westbury's championship winning speed-hillclimb car), or aircraft, those in the Project Office keeping us up to date with the exciting new P.1127. As a post-graduate trainee my salary had been boosted by this time to the grand sum of £8/3s/0d a week so, with a bedsit in Teddington at £3 a week and cheap canteen lunches, I was really in the money. With an old 1933 Morris Minor two-seater, purchased for £5, and petrol at 4/- a gallon (the new Russan 'Jet' petrol at Hampton Court) we were mobile as well - was it really only forty-five years ago that costs were so low? A surprise to me in the autumn of 1960 was the Apprentice Prizegiving when, for having successfully completed my degree course, I was presented with a set of books and a toolbox, and had my photograph taken with Sir Sydney Camm; all items which I still treasure to this day.

After 'Progress' I went back to the 'Inspection Test House', then on to 'Subsidiary Process' (heat treatment and coppersmiths, probably), the 'Press Shop', back to the dreaded 'Machine Shop' then on to the 'Toolroom' which I think was in the famous old roller

skating rink in Canbury Park Road. This was the most enjoyable and best instruction that I received during my years with Hawkers. I was put with one of the older toolroom fitters, Bill by name, building Avro 748 aileron jigs destined for India, if my memory serves me correctly. Union rules of not being allowed to touch tools did not seem to apply in this department and Bill taught me how to carry out precision fitting work and to be absolutely precise, a skill which I like to think has served me admirably for the last forty-five years, both in my managerial positions and in my hobbies and work at home. Then on to 'Plastics' at Richmond Road making fibreglass models of the P.1127 (for wind tunnel testing or directors' desks?), which also involved weekly hand inspections for dermatitis by the lovely nursing staff. Then to 'Rear Fuselage Installations' threading hydraulic pipes and other equipment through the structures and learning to wire lock nuts and other fittings correctly, usually working blind through small access panels. Last was the Vulcan, before going down to Dunsfold to 'Final Assembly' and 'Flight Shed' involving a daily return journey from Kingston in the Company's brown coach.

This was probably the most exciting training period for all apprentices, and it now being mid-1961, early flight trials of the P.1127 were taking place, as well flight testing of two-seat Hunters and Folland Gnats. At this time Hawkers had, lined up around the airfield perimeter, dozens of ex-RN Sea Furies, which the company had repurchased from the Ministry at virtually scrap prices with intention of refurbishing them and selling them to overseas customers. One of the jobs we did with these aircraft was to inhibit the 18 cylinder Centaurus radial engines by injecting rust inhibitor into each cylinder; we became expert at knowing the timing sequence of these monster engines by the end of the job. Also lined up were numbers of early Hunters, also bought back from the Ministry and from overseas operators. These were stripped down, refurbished, brought up to the latest standards and exported to many air forces. The intended market for the Sea Furies was Cuba but the plan fell foul of the US Government embargo on military goods to Communist Cuba, for by this time Fidel Castro controlled the island. I later heard that most of these beautiful machines fell to the oxy-acetylene cutters; what a tragedy. I was told that the Furies were bought for £70 each (the Hunters cost a little more at £100). If only we could have looked ahead and stacked a few away for thirty or forty years!

From Dunsfold it was back to Richmond Road and the 'Ratefixers' (pretty boring) and then a couple of months with Wally Rayner in 'Works Management'. All the apprentices who had worked for Wally warned me of the tongue-lashing that apprentices regularly received in his office, but I found Wally a great chap to work for and thoroughly enjoyed my few weeks with him, so I must have done something correctly! He certainly did not stand fools gladly, but if you did what he asked promptly and got answers back to him in a timely manner he was always prepared to encourage you and share a joke, even if his humour was a little dry at times. As one among the stream of apprentices who went through his office over the years I am sure he would have no recollection of me whatsoever, but I was pleased to see mention of Wally in an early Newsletter and sad to read of his passing in 2004.

After 'Works Management' there followed a month in the 'Buying Office', located at the front of the smart new office building in front of the factory, working on contracts and sometimes discussing with the department head performance details of his brand new Mini-Cooper. It was then upstairs to the 'Production Drawing Office' and the 'Experimental Drawing Office', working alongside the girls in the 'Lofting Section'. It was in the 'Production DO' that I was instructed to draw a design for the 'pen-knib' fairing for the P.1127 hot nozzle exhaust. Sir Sydney, on one of his regular tours of the DO, where he spoke to all the draughtsmen whilst checking their work, took one look at my drawing, shuddered, made some quiet comment to the section leader, and passed on. I'm sure my design never made it into metal, and I was never offered a position in the DO. Next stop was 'Design Installations', where I worked with Rene LeClair, with a final month in 'R&D' recording readings on the large fatigue test rig where Hunter wings were being tested to destruction.

So the final two years of apprenticeship came to an end and I subsequently decided to apply for a position in 'Design Installations', this being more in line with my Mechanical Engineering degree. That was where I was to spend the rest of my years at Hawkers, working for Rene on P.1154 fuel, cockpit heating and air conditioning calculations, struggling with a clapped-out analogue computer, passed on to us by the 'Advanced Projects Group', trying to make it work correctly. It suffered from loose connections in all the components and this was obviously why APG had finished with it. Salary, I seem to recall, was £1100 per annum or about £20 per week.

The in 1964 Harold Wilson and the new Labour Government decided to scrap the P.1154 and other aircraft projects (TSR2 and the HS681) and this was when I decided to seek pastures new, ultimately spending most of the rest of my working life in the oil industry, my interest in aircraft maintained by learning to glide. Thus it was that in September 1964 I sadly bade farewell to Hawkers and took one last look at the lovely gravel drive in front of the Richmond Road offices; we had all been itching to drive along this road with spinning wheels, but nobody had had the courage to take up the bets! Now, alas, along with the rest of the factory, it has gone for ever. They were great years with a great company and I made many good friends; my only regret is that the years passed all too quickly.

SOPWITH AND THE AMERICA'S CUP

John Crampton recounts tales of the nautical side of Sir Thomas...

First the Cup, then Sopwith. In 1851 the Commodore of the New York Yacht Club (NYYC), John Cox Stevens, wrote to the Commodore of the Royal Yacht Squadron, the Earle of Wilton, saying they had a mind to send a yacht called 'America' to England for a little competitive sailing. 'America' was not a NYYC boat but one built by a syndicate within the Club who were intent on winning everything everywhere. And the way to do that was to build a fast sailing boat along the lines of the pilot schooners which sailed out of New York to meet incoming ships on the basis that the first alongside got the job of piloting the vessel into New York. This was a remarkably lucrative trade and the fastest vessels got the job. Eventually on the morning of July 30th 1851 'America' arrived off Cowes, and not long afterwards Stevens approached Lord Wilton with an offer to race any vessel he cared to nominate for the astonishing sum of $50,000. The result was, to say the least, disappointing. "Say, Earl. whaddya say to a head-to-head game fer fifty big ones?" "Ah, hum, we'll see, Mister Er...?" Some say the behaviour of the British at the time was either cautious or cowardly, but actually the British simply had no idea what the Americans were talking about.

In the trophy room at the Royal Yacht Squadron (RYS) was a perfectly hideous cup resembling an ornate water pitcher. Members of the Squadron gave shudders of revulsion every time they set their eyes on the silvery excrescence. Here at last was a chance to get rid of the awful thing. A race round the Isle of Wight was arranged for August 22nd 1851. The prize was to be the One Hundred Guinea Cup (for that was what the ghastly object was called). 'America' took off like a scalded cat whizzing round the fifty-three mile course in ten hours and fifty-three minutes beating the first of the fourteen RYS competitors by eighteen minutes.

Thus the trophy became known as the 'America's Cup' and was taken back to New York where it was stowed away for twenty years in Commodore Stevens's house, well out of sight of those of a nervous disposition. Time came for the 'America' syndicate to make their wills, leaving the vessel to the NYYC. The Club studied the Deed of Gift and found that the Cup was up for grabs to any foreign yachtsman representing a recognised club. The challenger had to sail to the defender's waters as 'America' had sailed to England in the first place. The first serious challenger was James Ashbury representing the Royal Thames Yacht Club who failed to bring the Cup back to the UK in August 1870, and thus set a trend. Space prohibits me from detailing the twenty-nine challenges for the Cup at three or four year intervals that have taken place since those far off days, except to say that America won the first twenty-four of them.

In 1983 America lost to the Australians and so great were the celebrations down under that their Prime Minister went on nation-wide TV to say that "...any boss who sacked an employee for turning up late for work today is a bum."

And today? Surprise, surprise, the Swiss have it! In the challenge before last the Kiwis won it. I think, but don't quote me, the Swiss sent a team out to New Zealand and chartered a Kiwi boat for the last challenge; got the help of one or two New Zealanders too. So where will the next, 2007, challenge be held? I think you can quote me on this; Valencia, two hundred miles down from Barcelona on Spain's sunny east coast.

Now, Sopwith. Always a keen and good yachtsman, he won England's 12-metre Championship in 1927, 1928, 1929 and 1930 and was invited to join the RYS (you do not apply for membership). Early in 1934 he asked Charlie Nicholson of Camper Nicholson, builders of fine boats at Gosport, to build him a J Class yacht, the 'Endeavour', and got the RYS to support his challenge for the 'America's' Cup that year.

The new J Class boats were big, seriously big. For instance, the top of the mast was one hundred and sixty feet above the water. One day they had a problem up there and sent a young member of the crew up in a bosun's chair. When ten feet from the top the weight of the halyard bearing the weight of the chair and its occupant weighed more than the chair and its crew member. The load was therefore taken gently to the top of the mast by the halyard's weight without any effort required from the deck crew. So there was the young gent marooned at the mast head! How to get him down? Fortunately there was an external signal halyard within reach of the young gentleman who was instructed to grab it and pull himself down ten feet when the deck crew below started to take the strain.

On another occasion they got on board 'Endeavour' while it lay to its mooring at the top of Southampton Water on a day when there was no surface wind. Not a whisper. Even a candle flame would not have moved had one been lit in the cockpit. And yet the flag atop the mast was fluttering quite happily in what looked like a ten knot westerly breeze. Sopwith asked for the mainsail, weighing a ton, to be raised. They cast off and the big boat sailed happily southwards down Southampton Water with the top one third of the sail full and the lower two thirds flapping in what appeared to be a ten knot headwind.

Sometime in the 1980s, could have been the early 1990s, Jo and I were sailing happily up Southampton Water at five knots in our 30 ft Westerly 'Renown' auxiliary ketch. Lovely day. Wind Force 4 from the west. Suddenly there was an awesome noise; roaring, flapping, swishing sound. Quite frightening for a moment or two. Nothing ahead nor to port or starboard. I looked over my right shoulder, and there it was - 'Valsheda'. A J Class yacht from the 1930s once owned by a gent with three pretty daughters so he joined their names together; Valery, Sheila and Daphne and made up Valsheda. Beautiful thing, roaring up to overtake us at about twenty-five knots. The roaring and the flapping was the wind in the sails and the rigging, and the swishing was the movement of the hull through the water. I looked up and the top of its mast was directly over us when she passed. Breathtaking..!! Some lads had got hold of her and done a good rebuild. She was on charter for about eight hundred quid a day - per person..!! Oooooh , how I longed to have a go, but t'weren't to be. You had to be very careful when sailing a thing like that in the crowded waters of the Solent. Some people do silly things. I once saw a horrible photo of a J Class yacht sailing OVER a smaller boat which had crossed the big boat's path without warning. Yes, casualties and fatalities. The little boat went to the bottom.

'Endeavour' proved to be a great success with good handling and won several trial races. All preparations had been made for departure for America when disaster struck; the crew asked for more money. Sopwith wouldn't agree so the crew walked off! Sopwith collected a scratch crew of twenty-seven and they departed on schedule.

Great beginnings! Sopwith won the first two races (out of five) and then things went seriously wrong. During one of the subsequent races Sopwith was being overtaken by the defender and so quite legitimately tried to 'luff' the American boat. They were beating to windward and naturally the Americans steered a course upwind of Sopwith to try to put his sails in their shadow. Sopwith gently steered his vessel into the American's course to make the defender point a little higher into wind so hopefully reduce its speed. There is a golden rule in racing - Overtaking Boat Keeps Clear. The defender should have altered its course to keep clear of Sopwith, but it did not. There was the immediate risk of collision. Sopwith eased back and let the American go ahead. "I did not go all that way to drown people", he said later. By not altering course to keep clear of Sopwith the Americans were in breach of the rules. This gave rise to an English newspaper headline, "America waives the rules." But Sopwith made an error; he should have flown his protest flag, but didn't because they were well out of sight of the Committee Boat and there was little point in flying the flag unless the Committee Boat could see it. There's another little wrinkle to the story; once the overtaking boat's bow is in line with the slower vessel's mast it can proceed on its course. The exact position of the overtaking boat's bow in such circumstances is always a matter of spirited argument at later hearings. It took a while for the NYYC to agree to hear Sopwith's protest and when it did Sopwith lost his appeal.

Sopwith never liked telling the above story but when he did he normally followed it by the one about the occasion when just before the start of another race he had a big problem with his mainsail; it would not go up. The Committee Boat saw his difficulty and signalled to both yachts, "Start postponed twenty minutes." Sopwith signalled back, "Thank you. They would not have done that on the Solent!" The delay gave Sopwith time to overcome the fault and arrive on the start line in time. But he lost the last three races and America's Cup stayed in the NYYC.

Then Sopwith asked Camper Nicholson to build two more boats. Another faster J Class to be called 'Endeavour 2' and a motor yacht of magnificent proportions, 'Philante', named after his wife Phylis and his son Thomas Edward. An interesting vignette can go in here. Sopwith asked Frank Murdoch, a member of Hawkers and his long time sailing friend, to go to Germany and select two suitable diesel engines from the M.A.N. Company for 'Philante'. While in Germany Murdoch was shown round a number of their aircraft factories and aircraft engine plants. He was very impressed with what he saw and reported it to Sopwith on his return to the UK. Sopwith

reckoned that there would be a war with Germany and so arranged for the Hurricane to be put into quantity production immediately, without waiting for a Government order. Remember, this was about 1935/36 and the prototype Hurricane flew in 1935. And so with plenty of Hurricanes on hand five years later we won the Battle of Britain.

Sopwith returned to America with 'Endeavour 2' in 1937, but by then the Americans had 'Ranger', the fastest J Class boat ever. Sopwith was tremendously impressed by it and by the way its crew sailed it. "Unbeatable", he said, "Absolutely unbeatable!" The defender won all five races and so again the Cup stayed in the New York Yacht Club.

HAWKER PEOPLE NEWS

Sadly we must record the deaths of Alan Gettings of Flight Development and Malcolm Ruscoe-Pond of the Project Office etc. Our thoughts and condolences go out to their wives, Pam and Elizabeth, relatives and friends. Equally sadly, Ted Hemsley of Production at Langley, Kingston and Dunsfold, has also died. Again, our condolences to his wife Sheila, family and friends.

We welcome new Members Colin Dodds, Harry Johnson, Anne Martin, Elizabeth Ruscoe-Pond and Mike Sharland.

HAWKER ASSOCIATION MEMBERS - JANUARY 2007

Note - Members in **bold** have not paid their 2006 subscriptions.

A: Mike Adams (a), Ken Alexander, Peter Alexander, John Allen, Martin Alton, Terry Ansty, Alma Apted, Steve Apted, John Arthur, Alan Auld, Bryan Austin. **B:** Brenda Bainbridge, Colin Balchin, Ambrose Barber, Ray Barber, Derek Barden, Peter Barker, Geoff Barratt, Graham Bass, Ken Batstone, Dennis Baxter, Colin Bedford, Anne Beer, Guy Black (A)**,** John Blackmore, Keith Bollands, Paul Boon, Cliff Bore, Steve Bott, Pat Bott, Bob Bounden, Alan Boyd, Pat Boyden, Phil Boyden**,** Roy Braybrook, Clive Brewer, Laurie Bridges, **Ian Brine**, Doug Britton, Peter Brown, Christopher Budgen, MP Budgen, Roy Budgen, Reg Burrell**,** Robin Burton, Ron Bryan, .**C:** Richard Cannon, Maurice Carlile, Chris Carter, Bob Catterson**,** Ken Causer, **Jeremy Cawthorne**, John Chacksfield, Colin Chandler, Keith Chapman, Gerry Clapp, JF Clarke, John Cockerill, Hank Cole (a), Bob Coles, Percy Collino, Brian Coombes, David Cooper, Paul Cope, **Patricia Cosgrove, Ron Cosgrove,** George Cotterell, Nick Cox, Shirley Craig, John Crampton, Russ Culley**,** RG Curtis. **D:** Roger Dabbs, John Dale, Clive Dalley**,** Andy Dalton, John Danse, Afandi Darlington**, Jo Davies**, John Davie, Ken Davies, Trevor Davies, Diana Dean, Ralph Denning (A), Norman Deviell, Mike Diprose, Richard Dobbs, Mike Dodd**,** Colin Dodds, Lambert Dopping-Heppenstal, Jack Dowson, **Brian Drew**, Dick Duffell, Jean Duffell, Peter Drye, Neville Duke, Chris Dunhill, Mike Dyke. **E:** John Eacott, John Eckstein, Andy Edwards**,** Dave Edwards, Tony Elliott, Celia Evans, Norman Evans, Roy Evans. **F:** Russ Fairchild, Ian Falconer, **Mike Fantham**, Chris Farara, John Farley, John Farrow, Max Fendt, Stan Field (a), Geoff Fieldus, Mike Finlay, Wilf Firth, **Ann Fletcher, Richard Fletcher**, Colin Flint, Dave Fowler, Mike Frain, Harry Fraser-Mitchell, Geoff French, Mike French, Heinz Frick. **G:** Roy Gaff, Mike Gane, John Gardner, Patricia Gardonio, **Peter Gates,** Sandie Gear, Tim Gedge (A), Mark Gerrard, Tony Gibbs, John Gilbert, Maurice Gilson, John Glasscock, Pat Goodheart, Eric Goose, John Gough, Andy Green, James Griffin, Barry Grimsey. **H:** Douglas Halloway, Liz Hargreaves, Simon Hargreaves, Bryan Harman, Dawn Harris, Guy Harris, Thelma Harris, Brian Harvie, David Hastie, Eric Hayward, Bob Head, Sheila Hemsley, Jock Heron (A), **Tony Herring (**a), Keith Hertzenberg (a), Frederick Hewitt, Merlin Hibbs, Richard Hickey, Peter Hickman, Vince Higbee (a), Reg Hippolite, Keith Hobbs, Chris Hodson, Gordon Hodson, Derek Holden, Doc Holliday, Ralph Hooper**,** **Linda Hopkins, Paul Hopkins,** Mike Hoskins, Gerry Howard, Dawn Howes, Terry Howes, Simon Howison, Gordon Hudson, Gavin Hukin. **I:** Pete I'Anson, Len Illston, Maive Impey, David Ince (A), Brian Indge. **J:** Keith Jackman, John Janes, Gordon Jefferson, Harry Johnson, John Johnson, Brian Jones, Ian Jordan, Trevor Jordan, Robin Jowit, Alf Justin. **K:** Brian Kent, **Dennis Ketcher**, Bill King, Dave King, **Martin King,** Charles Kirk, Ralph Kuhn. **L:** Barry Laight, Mike Laker, Charles Lamb, Richard Lane, George Latham, Paul Latham, Pam Lawrence, Andrew Lawson, **Ron Leader,** Geoff Lee, Gordon Lewis (A), Mark Lewis, Vernon Lidstone, Gary Lillistone, Andrew Lloyd, **Gary Lockley**, David Lockspeiser, Norman Long, Gordon Lorrimer, David Lovell. **M:** Albert Magee, Al Mahoon, Mick Mansell, John Marsh**,** Bill Marshall, Anne Martin, Bob Martin, Dennis Mason, Brian Maton, Don McGovern (a), June McKeon, Ronald Mears, Mike Mendoza, Jim Middleton, Kit Milford, Robert Millar, Jack Mills, Brian Monk, Pat Moon, Leslie Moore, Pauline Moore, Nicholas Morland, Pete Munday, Carole Murphy, Gloria Murphy. **N:** Jennifer Nicholas, Anthea Newman**. O:** Roger O'Brien-Hill, John O'Sullivan, Robin Owen. **P:** Les Palmer, Graham Parker, John I Parker, John L Parker, John Partridge, Bernard Patrick, John Pearce, Barry Pegram, Martin Pennell, Bill Phillips, Ted Pincombe, Dick Poole, Don Pratt, Dave Priddy, Mike Pryce (A). **Q:** John Quinn. **R:** Clive Radley, **Raharto** (a), Frank Rainsborough, Colin Raisey, **Brian Ralton**, Paul Rash, Diane Raymond, Vanessa Rayner, Douglas Reallf, David Rees, Peggy Remmington, Francis Rhodes, Geoff Richards, Bill Richardson, Chris Roberts, **John Rodd**, Eric Rubython, Elizabeth Ruscoe-Pond, Peter Ryans. **S: Helen Sadler, Roger Samways,** Ian Sandell, Bernie Scott, Alex Seaman, Ray Searle, Maurice Shakespeare (a), Mike Sharland, Arthur Sharpe, **Peter Sibbald,** Bill Sherwood, Jack Simmonds, Sadie Simmonds, Duncan Simpson, Derek Sims, Gerry Sims, Charles Smith, Don Smith, Harold Smith, John Smith, Karl Smith, Pete Smith, Selwyn Smith, Roy Sparrow**,** Peter Spragg, Cora Stanbury, Vivian Stanbury, June Stephens, John Strange, Carroll Stroud, Mike Stroud, Christine Strudwick, Tony Strudwick, Douglas Stubbs, Bill Swinchatt. **T:** David Taylor, Stuart Taylor, Brian Tei, **Reginald Thompson, Geoff Tomlinson**, Graham Tomlinson, Rod Tribick, Peter Trow, Ron Trowell, **Frank Tuck,** Bert Turner, **Michael Turvey**. **U:** John Underhill. **V:** Herbert Valk. **W:** Terry Walker, David Ward, Harry Webb, Patrick Webb, **Graham Weller**, Rob Welsh, AP West, Bryan West, Judith Westrop**, Jenny Wheatley,** Phil Wheatley, Jan White, Mick White, Roy Whitehead, Peter Whitney, Annette Williams, John S Williams, Don Williams, Ron Williams, Sally Williams, Colin Wilson, George Wilson, Paul Wilson, Dick Wise, Helen Woan**,** George Woods, Len Woodward, Alan Woolley**.**