



AALO SG Nic Holman, Pres & Memberships

Phil Kingsbury, Merchandising



*Max Waldron, Founding Member Charles Scott, Hon Member*

*Unless otherwise indicated, written by Nic Holman & All edited by Phil Kingsbury*

It is always a pleasure to open the newsletter with a Lightning image, either photographed or painted, and on this occasion it gives me great pleasure to share the very latest work from Richard Wheatland. Richard has been painting aviation for many years and is a member of the Guild of Aviation Artists.

The wonderful painting reproduced above, entitled 'Perfect Partners', shows TSR2 XR219 with a Lightning T4 escort. The original, in oils, is 700mm x 500mm. Richard will be entering it later this year for a competition with the GAA & hopes also to see it reproduced as a greetings card.

Many thanks to Richard for allowing me to share his outstanding work in this newsletter. To enjoy more of his work please visit his website [www.richardwheatland.co.uk](http://www.richardwheatland.co.uk)

**The SG ...** I've recently taken over from Charles Scott as Membership Secretary & Treasurer of the Supporters' Group, to add to my Presidential duties and am enjoying getting to communicate with an increasing number of you. I'd like to thank all of you who have chosen to renew your memberships this year. I would also like to personally thank all those who had been members in previous years and who've now decided to rejoin. With our continued engineering work on XS422, as well as our continuing plans to attend

AirVenture 2010 at Oshkosh later in the summer, any funds that can be brought to the project are especially welcome this year. Please feel very welcome to share this newsletter with friends, family and colleagues and encourage them to take up a membership.

Notwithstanding his busy engineering diary AALO Chief Engineer, Phil Wallis, has kindly taken time out to report on the progress made during the last trip to Stennis for the newsletter. So, here goes!

### Stennis March 2010 – Phil Wallis ...

“The engineering team completed a 3 week visit to Stennis on the 29th March, made up of two smaller teams; the ‘advance party’ consisted of Rod Barker, Milton Roach and Dave Tylee, all members of the Gatwick Aviation Museum Team who are restoring the museums own ex-Royal Saudi Air Force Lightning F53, they are also stalwarts of the AALO eng team. Rod and Milton’s primary task was to continue the restoration of the electrical systems throughout the airframe, a laborious task with little physically to show for their efforts. They managed to clear several troublesome snags with the reheat control system and also refurbish several terminal blocks connectors throughout the airframe which were partly corroded due to ‘422 being in ‘storage’ in its 40 ft shipping container for 8 years. Progress made on the electrical systems was excellent and ‘422 moves ever closer to being fully electrically compliant for flight.

Dave Tylee had the irksome task of carrying out minor rectification within the jet-pipe and reheat pipe bays as we move these areas forward in preparation for fitting engines and reheat pipes. These areas were generally in good condition when we received ‘422 and most of the faults were surface corrosion related. Dave then moved onto the restoration of the cockpit with Milton and they managed to continue the rebuild of the cockpit side consoles, fitting as many brand new components as we have in stock. Dave and Milton also continued with the refurbishment of the cockpit rear bulkhead, the ex- Royal Saudi Air Force cockpit providing a much need resource of spares for refurbishment and re-use.

Part of my time at Stennis was to continue my work in this area and the cockpit is definitely starting to look like a flying ‘office’. Over 3000 man-hours have been expended in this area alone on the restoration; all of it due to due to extensive corrosion, 95% of which has had to be removed and refurbished or replaced. I knew that this area was going to be the greatest consumer of man-hours with this restoration and it has not proved me wrong. Still much to do here but we are well over the hill and on the finishing straight with the cockpit. Main items remaining here are the rear bulkhead area particularly where it meets the cockpit floor.

Here’s an example of what a difference has been made in just what is effectively 14 days work in the cockpit.



From March 2009:



To March 2010:

A lot of effort went into refurbishment of the starboard side of the cockpit as this picture shows, note the starboard throttle box and above it the frequency card holder and in front the rudder trim switch console. Both main switch panels known as the A3 & A5 Panels (immediately in front of both crew members and between their legs) were also tested.



Myself, Geoff and Dave Yates started work on the 20th Mar our prime objectives being the preparation of the fuel system for engine running/flight to include X-Ray Testing of main fuel couplings in the hot zones, cockpit refurbishment and final testing of the mainplane centre section.

Dave and Geoff have wasted no time in setting too with the Fuel System tests and checks. The No 1 Reheat Fuel Filter was examined and found to be in excellent condition and the No1 Hydraulic Systems Heat Exchanger was also removed to check the cooler matrix for debris (over time this can get blocked/restricted with debris from the wing fuel tank as fuel passes over the matrix to cool the hydraulic fluid). Additionally, Dave also prepared the main Fuel Couplings in the No1 Engine and Reheat Bays for X-Ray testing later in the trip. It is necessary to X-ray these couplings to be able to 'see' that the seals and the mating flanges of the pipes are correctly aligned and assembled – a mandatory requirement for flight and for the Lightning 'Fire Integrity' Checks prior to fitment of engines.

Dave Yates also completed the work assignments in the No 2 Engine Bay, namely; examination of the No2 Reheat Fuel Filter and the g the Reheat Fuel Filter and checking the Matrix on the No2 Heat Exchanger

I continued with the restoration of the cockpit mechanically and completed a full reconciliation on all the cockpit items we have in stock and removed all of the surplus 'new' spares and redundant items removed from 422 to create a definitive set of kit that is purely for fitting to '422's cockpit. This task took two days alone.

Once Dave & Geoff had prepared the fuel system FRS coupling's for X-Ray they moved onto pressure testing the main fuel pipelines'. Firstly, they completed pressure testing of the FRS couplings in Zone 1(No1 Engine Bay) - all passed at 75 psi. They then moved to Zone 3 (the refuelling gallery) at the front of No1 Reheat Bay and pressure tested to 50 psi - all couplings passed, however, one leak in an FRS coupling in the port wing root was detected and rectified. The system was re-tested and passed. Finally, the fuel system in Zone 2 (No2 Engine Bay) was tested at 75 psi as passed; fuel pressure testing of the LP fuel systems is now completed.



We also found time to fix the leaking roof on the spares container, this is suffering from corrosion and will have to be repaired annually, several boxes inside were water damaged, Geoff did his best to re-box the worst but we really need a team of our volunteers to sort this area out on a future trip. Geoff also acknowledges that removing items from there cardboard boxes that are invariably 60% larger than the item itself will significantly reduce the overall square footage of spares held. I estimate that if we were to remove these non-

critical items from their RAF packaging we could reduce the size of the boxes in the container by 60%. This would create much need additional storage space in the container – volunteers?

As the fuel system testing was well ahead of schedule I decided to carry out a blood transfusion of the Hydraulic Oil within '422's four systems, This meant applying air pressure to the four reservoir internal rubber bags to 'squeeze' out the old oil. I then replenished the reservoirs with fresh hydraulic oil (known as 'OM-15'). Each system was then powered up to full working pressure (3000 psi) and all systems were functionally tested to move as much of the fresh fluid around the pipework as possible. No new leaks or degradation of the hydraulic system is apparent. However, we still need new seals for most of our swivel couplings or 'walking-joints' as they as referred to in the USA. Overall the hydraulic systems are in great condition.



*'LSEPT' Rig & Hydraulic Rig online*

We then moved onto pressure testing the main fuel tanks to check for leaks on the centre section, the tanks were pressurised to 7 psi in accordance with the maintenance schedule and are left at this pressure for 20 mins. The Centre section passed this final check and the last of the heat shields in the No1 engine bay were initially fitted. Therefore the saga of the centre section fuel leak repair is over after many hours work, well done to all of you who have been involved with this 'problem- area' over the years.

*Aileron Functional Testing at 3000 psi (note 'Horn-Balance' on wingtip)*



*Rear Centre Section Heat Shield is being fitted by Dave*



Our final full day's work was with Jason Tiernay and Gerry from the GLOBAL X-RAY & TESTING CORPORATION from New Orleans. Gerry & Jason had come out to Stennis on their day off to carry out this task voluntarily and thanks go to Andrew, Nic, Wendy from Taylor Aviation and everyone else involved for their assistance in setting up this critical phase of fuel system testing Jason's job, under

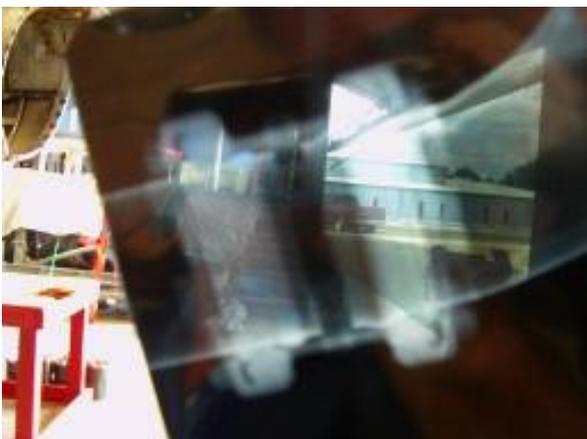
the direction of Dave Yates, was to X-Ray the coupling in Zones 1- 3. Using standard x-ray film and with a mobile workshop and darkroom the team tested all of the couplings in Zone 1 & 2. Jason & Gerry are usually fund x-ray testing oil industry pipelines and welds for cracking, so working on a Lightning Jet was a fresh challenge to them. Setting up the 'camera' and the time of the shots was done in no time and then this phase went really well, all of the couplings passed test which is testament to Dave Yates's 12 years experience on Lightning Major Servicing Teams before the type was retired in 1988. It has to be said that there is no substitute for experience and credit is due to Dave for his sterling work. Jason & Gerry were presented with AALO 'goodies' for their services (including some Magnolia Beer) and we owe them a huge dept of thanks as this type of work does not normally come cheap; top guys!



*FRS Couplings (identified with red tape) in No 1 Engine Bay ready for X-Ray shots*



*The 'Camera' or 'Source'*



*X-ray image from Zone 2*

*Jason, Gerry & Dave post X- ray testing*



## Summary

Many thanks to Nic Holman & Andrew Brodie for putting together our trip, it allowed me to concentrate on engineering and not have to worry about accom. transport etc. Thanks to the 'Gatwick Boys' for dedicating their valuable time away from their own projects onto '422. And thanks to Geoff Commin's, Dave Yates and most of all Global X-Ray, Geoff is over the moon with progress on the propulsions systems and by his own admission, did not think that we would bring together the X-Ray testing element.

Regards to all, Phil Wallis".



*Dave Yates   Rodders   Dave Tylee   Milton   Phil   Geoff*

**Bruntingthorpe Reborn ...** For the entire 10 years of the existENCE of the AALO our UK base of ops has been Bruntingthorpe Proving Ground in Leicestershire. This is where we keep our spares and also where we carry out some of our servicing and refurbishment of parts prior to shipping to Stennis.

Last year, with a growing need for space for the businesses based at Bruntingthorpe we lost our fixed base on the airfield and our containers and trailers were spread a little BIT around the airfield. While we still had access to everything it made working on things difficult.

I'm very pleased to report that through the sterling negotiations of exec, Max Waldron, with Dave Walton, the owner of Bruntingthorpe, we have been found a new home on site where all our assets are now homed together again.

Dave has been a huge support to our UK activities over the years and his accommodating us again on this occasion is very greatly appreciated. Many thanks, Dave.

**May 30<sup>th</sup> Cold War Jets Day ...** providing we can staff our tent, myself and Phil Kingsbury are aiming to be at the next Bruntingthorpe open day. This will be our last UK show before Phil, Geoff & I take AALO to AirVenture 2010 at Oshkosh, Wisconsin, in search of major investors, at the end of July.

Please take this opportunity to come and see us and donate towards the Oshkosh fighting fund.

**Oshkosh 2010 ...** Plans are very much up and running for our Oshkosh attendance at the end of July. I am project managing our attendance and if you feel you could contribute in any way, be it goods, services, or a financial donation then please drop me an email ([nholman@globalnet.co.uk](mailto:nholman@globalnet.co.uk)).

In advance of their contribution I would like to publically salute Bill Treay (Action Press, Diamondhead, MS) who has kindly agreed to donate our business cards for the show, and Graham Bird, who has agreed to look after our 'comp slip' flyers, as well as bringing them with him to Oshkosh. Graham is a Platinum member of the SG who has significantly donated in the past and we're hugely grateful for this new contribution.

Accommodation and a vehicle have also been donated for the trip.

Our last major outlay will be airfares so any assistance with these would be appreciated. If anyone would like to contribute to our booth costs and has a business of their own then we have some facility to acknowledge their company's sponsorship on the stand. I will, of course, be reporting in full following July and hope it is good news.

### Members News ...

I'm always keen to hear old 'war stories' from our SG members and this year we've welcomed **Michael Dudley** to our ranks. I asked Mike what his background was and he was good enough to pen a short resume, which I thought may interest others.

Mike writes ... *"In 1960-1962 I worked at English Electric, Wharton, as a contract design engineer. Initially on the design of the TSR2 wing but then on the Lightning. I believe it was the Mk 4, but that was a long time ago. Anyway I had to help document the installation of the hydraulics by going into the factory, checking the routing and supports and then back to the design office to prepare the drawings. It was easier to let the guys on the shop floor work out the routings and then document it later. Strangely enough I had a similar task on the Lockheed L-1011 Tristar in 1969-70 at Avco in Nashville Tn, documenting the electrical routing in the leading edge of the wing mockup. I started my aerospace career as an apprentice at Folland's in Hamble, Hants, working on the Gnat and Gnat Trainer, finishing up in the design office under Gordon Hudson and of course Teddy Petter."*

**In Memorium ...** It was with great sadness that we recently learned of the passing of Norman Holmes. Norman was a supporters Group member who first joined us in 2003.

**An Englishman Calls ...** One of our new SG members, Mike Evans, was keen to take up a benefit offered to all SG members, namely a visit to the AALO hangar by prior appointment if travelling in the Mississippi area.

Mike was on a timely visit to neighbouring New Orleans while Phil & the team were at Stennis in March so was delighted to have an opportunity to meet some of the team and get some photos of XS422.

In his own words, "Returned home last Saturday - 3200 miles later - which is fairly normal for my road trips. Yes, I got to Stennis and saw them. What a good time it was too. I got a good history from Phil and they also know one of my BA work friends who had worked with them on the Saudi Lightnings. The world got so much smaller during those two hours. I took loads of pictures so, thanks again for giving me the chance to see all this. It was well worthwhile!"

I've reproduced a couple of Mike's images on the next page. All of the images from the newsletter, plus others from the March trip and a bigger selection of Mike's pictures will shortly be posted on the website photo gallery.





**Cockpit News ...** I thought since this is one of the main focal points of the restoration at present it warrants some more in-depth news. While the rest of the airframe has visibly improved in recent years the cockpit has been somewhat of a sleeping giant. Until the electricians were happy with the cockpit wiring it was a false economy to rush the structural refurbishment.

The cockpit has not been neglected and has been 'visited' to varying degrees by the engineering team on previous trips resulting in the restoration of some structure and controls in situ.

While the 'office' has appeared unchanged for a year or so many of the major control items, once removed, have been undergoing restoration at Stennis & in the UK. These items, such as the throttle controls, control columns & rudder peddles have now been refitted in the cockpit and it is rapidly and impressively coming back together as the earlier photos demonstrate.

Currently around 70% of the cockpit instruments are in the UK and Rod Barker now has enough equipment to make a slave Air Data & Flight Control system which will be used to prove those instruments declared to be flight worthy.

The condition of the spare (A1) instrument panel, currently repatriated with the intention of using it as a space model, has proved itself in better condition than the one at Stennis. Consequently, it's very likely that this will become our primary 'dash'. Milton, Dave T & Rod will work their magic, including the refurbishment of the pillar lamp fittings.

Once all the instruments are serviceable they will be shipped to Stennis and refitted. A final bit of good news is that, as a project we are now confident we are not missing any major cockpit instruments or components.

**Donations ...** This newsletter's role of thanks once again goes to John Horrod, who has made a further substantial donation to SG funds. Thank you, John, for your continued great support.

I'd also like to publically welcome Tony Scott to our ranks as a lifetime member and thank you Tony for the financial vote of support your membership brings.

**Climb every mountain ...** While not strictly an aircraft matter I couldn't let this newsletter pass without recognising the personal achievement of one of our team, Mr Roger Winkworth. Last year Rog underwent knee replacement surgery and just over a month ago capped his recovery and a great deal of arduous training by walking to Everest base camp ... uphill all the way! He emailed me a while back with news of his achievement.

*"I have recently returned from Mt Everest base camp which was reached on the 24<sup>th</sup> March at 0900 hrs. The trek was in aid of arthritis research UK.*

*The going was very very tough and after trekking for 8hrs a day for 8 days the goal of Kalla Patta above base camp was reached.*

*For me at 61 and with an artificial knee joint it was an emotional time to sit at the base camp at 5550 metres with the peak of Everest at 8880 metres. Very difficult to describe my feelings. There were times when I thought I had bitten off more than I could chew but I was determined not to be beaten by the younger and fully fit members of my party."*



On behalf of the eng team, well done Rog!

**Memberships ...** If you are one of our complementary recipients of this newsletter and would like to increase your support for the project in a small financial way then we'd welcome your membership of the Supporters Group.

We have 3 levels of membership, £20 for annual membership with electronic newsletter, £30 for annual newsletter with printed/mailed newsletter, and a lifetime membership for £150.

We've now made joining much easier with the addition of a Paypal account. If you want to use this method then simply make your payment, via paypal, to [aalo.xs422@gmail.com](mailto:aalo.xs422@gmail.com) Alternatively you can send a sterling cheque (check) payable to "**AALO Supporters Group**" to

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