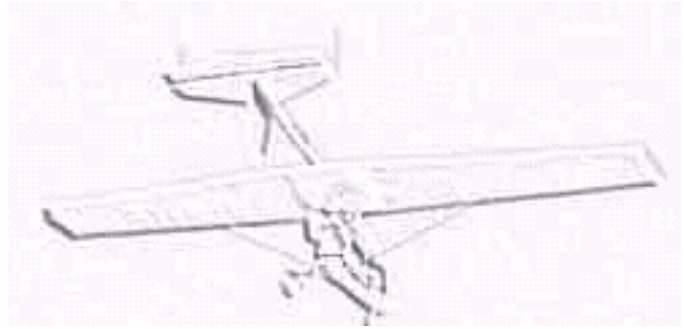




A member of the General Aviation
Awareness Council



Shadow Owners' Club Newsletter Autumn 2006

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New Members

Welcome to Barry Englefield, from Australia, Mike McKenzie from Aberdeenshire and Ian Fernihough from Derbyshire.

Membership currently stands at 49.

More from Danny

Nothing so far.

*D & J Crosbie Engineering,
'Mere',
Bures Rd,
Lt. Cornard,
Sudbury,
Suffolk.*

CO10 0NW

News from David Cook

The book David has been writing, mentioned in the Spring newsletter is to be published mid 2007, when more of his flying machines are depicted and their design principles described. The book is being published by Pen and Sword.

The Shadow Aerofoil

I have been asked through the Shadow Owners' Club to explain the Shadow aerofoil. Technical papers have been essayed by myself in the past but to reiterate the origin of this wing shape I will attempt again.

Aeronautical designers can make aircraft faster by increasing the power. Aerodynamics can help as well. The quandary for the designer is that usually the low speed part of the flight envelope suffers and stall or landing speeds rise. High lift aerodynamic devices have to be deployed to lower stall and landing speeds. We watch the amazing array of these devices from inside airliners as they come in to land - triple row extension flaps, leading edge slats, dive brakes - finalised by reverse thrust, brakes and parachutes on military types - all to slow an aircraft. All these devices have to be deployed because there is insufficient lift from landing with aerofoils that are designed to create low drag at high speed.

Thus we see that to fly at high speed is much easier compared to trying to fly slowly. (A brick will fly if it has enough velocity). The clever designer is one who can make low flight speed work.

Volmer Jensen designed 25 different aircraft during his life. Most were associated with low speed flight. His VJ-23 completed in 1971 stalled at only 15mph and was followed by VJ-24 with a stall of 12mph. I built both these types from Volmer's plans and both were foot launched gliders (some say rigid hang gliders). I can affirm the minimum speeds. The clever part with the VJ-23 was that there was no defined stall break.

After flying the VJ-23 across the English Channel in 1978 with a 9hp motor attached to it I was invited to meet and stay with Volmer in California, USA. There I met the aerodynamicist Ira Culver who was the aerofoil genius behind Volmer's designs. It was a great privilege to talk to one of the world's top men in their field as he had named the Lockheed Skunk Works, and was principally in charge of the aerodynamics for the F104 Starfighter, U2, A12 and SR71 spy planes. Ira also worked on his own designs and many other consultations. Ira and Volmer were buddies and I was, amazingly at half their age, considered by them to be a prodigy!

The three of us, in 1978, took the VJ-23, which was powered by the 'Cook' bolt on power unit and propeller out to Huntingdon Beach to fly. I saw both Volmer and Ira (who weighed 210lbs) fly very conservatively around a circuit in this machine. I was on the English airshow circuit at the time and yanked the aircraft all over the place, much to their amazement at what it could do. "Gee, we didn't know it could do that!" After flying I asked Ira why the VJ-23 had no defined stall. He explained to me the theory he had applied to the wing aerofoil, called 'drooped leading edge'.

This was a wing without twist being built straight, but the D-box structure leading edge had washout progressing from the root (centre), which was symmetrical section to minus 2.3° washout at the tip. The tip looking very similar to a Clark Y section. This wing

aerofoil gave no defined stall. The low speed part was the built-in flap effect used on the undersurface. With 32ft span the centre of the wing was 18" deep! Not a high speed aerofoil, but one that allowed foot landing. I think when flat out I managed 25mph level speed...

The Shadow aerofoil was designed by myself using this drooped leading edge in the D-box section of the wing. Designing the whole of the Shadow was, for me, a mind stretching episode, but principally only three things were significant - the wing, the wing spar and the monocoque fuselage. It may be of interest that these three things took me three weeks only. (NOTE - that there are over 500 hours in three weeks and I must have worked nearly every one of them). I had been hunched over a sheet of hardboard, used as a drawing board, on my lounge floor such that for several days after I could not walk upright. But in 1982 the design was there!

The aerofoil design came from many hours of study from a book 'Theory of Wing Sections' - H. Abbott/Von Doenhoff where one can see the characteristics of aerofoils to suit the envelope of one's proposed aircraft.

I got so that I could 'read' the aerofoils from the computation data. Big trouble was that there were no aerofoils relating to a speed range of my proposed design - the Shadow. No aerofoil depicted showed a flight speed range of 20 to 100mph. I think the era of those speeds had passed. Sport or club designed aircraft accepted the usual NACA wing aerofoils that gave best compromise - when in reality they gave neither the low speed lift nor least drag at speed.

Thus I was to be stuck with my own thoughts, except my aerofoil would have the drooped leading edge because 'no stall' is a major asset. The section at the root of the wing (centre bit) was almost symmetrical and by a series of percentages I calculated the plotting computation as the D-section progressed towards the tip - whilst tapering fore and aft and up and down. I didn't consider myself particularly clever in the intellectual sense, not being exceptionally brilliant at mathematics either, but the development of these leading edge D-box sections came out

very well. The 2.3° washout worked in leaving only the wing profile aft remaining. Studying wing profiles showed that apart from some Caminax section, where lift could be useful up to 50% chord (fore/aft of a wing), most of a wing's lift is in the first 30% chord - and a lot surprisingly in front of the wing itself! Pressure waves can be accepted watching dolphins in front of a ship. The same applies to an aircraft wing. So I didn't consider that aft from the D-box (25% c) would be a significant lift producer - merely a streamline effect. The trailing ribs are widely spaced because they only hold a true profile on a fabric wing covering. Therefore these are relatively straight along both upper and lower surfaces.

I envisioned that in 1982 that my Shadow design was going to be the fastest microlight, ever. During initial flight tests the manners of the wing was so good as to be unbelievable. As all pilots of this aircraft know it has no defined stall-break. In testing the flight envelope showed that 20 - 100mph was exactly as I perceived. Shadow 02 is still flying in 06 year - some 23 years after its first flight in 1983. 02 will sit almost seemingly motionless, at an indicated 20mph and still holds the official FAI World 3km speed record of 126kph. As this category is C1-A/O was deleted by the FAI then O2 will hold this record forever!

We additionally found that the Shadow would not spin - even when two CAA pilots tried everything in the book to make it break into a spin. All they could get was half a spiral turn from which the Shadow would immediately recover. This combined with the non stall was a major safety attribute. So you can now understand why those of us with less than perfect flying abilities do not crash Shadows.

I always wonder why with this history that no other designers incorporate these assets.

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News from the Shadow Flight Centre

Raymond is now able to conduct biennial flights for revalidation of JAR/PPL SEP ratings.

The article I'm planning about the Shadow Flight Centre has been postponed to the next newsletter.

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Registration changes

I'm not aware of any Shadow registration changes in the last 3 months.

Shadow Fly-in July 16th or Happy Birthday Shadowfax

The week before the weather reports were good, the reports were very good. But we don't believe them, do we?

July 16th 2006 dawned sunny and hot! By 8:30 it was really hot, the Dorset countryside looked stunning, the air was smooth, the visibility very good, things looked absolutely right for the perfect Fly In.

Henstridge Airfield was the venue for the Shadow Fly In; an idea that came out of the fact that Paul Mogg felt that the 20th Birthday of his Shadow G-MNXX Shadowfax should be celebrated. Originally built by Fiona Luckhurst, who must be known by every Shadow owner, XX is the trainer of countless pilots, camera ship for the movie industry, and has been subsequently owned by several pilots, all with happy tales and adventures, it was felt that a celebration was in order.

Anyhow, it was a good excuse to "organise" a Fly In.

Joe Williams, the airfield manager, was happy to let us set up camp in the middle of the aircraft parking area and quickly through the generosity of Russell Eddington two

gazebos were erected for shade. Shadowfax was installed in front of these in pride of place, complete with birthday card.



Picture 1 - In the shade of the Gazebo

Now, where were these Shadows?

Three resident Shadows waited patiently in the climbing temperatures, G-BSMN, G-BWPS and G-MNXX as a worrying hour went by then there was a Shadow in the circuit. Derek and Veronica Hermiston arrived from Sandown in their splendid G-MWYD. Slowly they came, G-RINT with Dave and Paul from Shoreham, G-BZEZ with Gary and Pat Pearse from West Sussex, Richard Osler from Over Farm, Gloucester in G-MTDU. Tony Halsall came from Ince Blundell, Liverpool, in his 912 G-BXUD. Paul Turner from Old Sarum in G-MWSZ, followed by G-MWVG with Fiona and Raymond taking a day off. We were especially pleased to see Fiona, the celebration would not have been complete without her presence. All around people were sitting in the shade of Shadow wings, slowly shifting position with the shade, moving from one aircraft to another, chatting Shadows.

Next came a giant Shadow, in the form of Sky Arrow G-IOAI; this we allowed to park with the Shadows. It was flown by Nick Ray and Peter Ward, who were previous owners of Shadowfax. Furthermore, they have excellent pictures on the Internet of their travels with 'XX. One of these photos, supplied by Raymond, was used by Lisa, Paul's wife, to decorate the birthday cake for Shadowfax.

By this time the BBQ was fired up, a splendid job being done by cooks Monty Eddington, Lena Coombes and Chris Mogg, much fine food and banter.

Graham and Jill Horne ably assisted Paul Mogg on more marshalling as another welcome batch arrived.

From Popham came G-BZWJ with Terence Morgan, G-MTSG from London Colney with Colin Purvis. John Reed brought G-SNEV from Old Sarum. Stewart White brought G-MWJF from Chilbolton. David White brought G-MTMX from Plaistows. The Hog G-WHOG with Brian Cannell, also Ian Southcott with G-BSRX, both from Old Sarum. Damian Moran from Old Sarum brought G-MVLP. Two arrivals from Craymarsh Farm arrived after an aborted first attempt due to weather, Ed and Carole Bowles brought G-MYOS and Gregory Moor brought the ever stunning G-MEOW. Last arrival was Mark Hayward from Bodmin in G-BXWR.

Cutting the cake was carried out by Paul Mogg after a short photo session with Paul, Fiona, Nick and Peter of course standing next to Shadowfax.

Late afternoon saw the bin of empty water bottles overflowing, the cake had been devoured and slowly Shadows started to depart. Tony Halsall won the kite for longest distance travelled, presented by Lisa moment before he departed. The temperature was now well into the thirties, but Shadow departures showed the Spam Cans the way it's done. By Five it was almost over. Twenty Three Shadows had attended by our count, very encouraging. A marvellous day was had thanks to our helpers, and we hope to double the number next year. How about it? Coming?

John Porter G-BSMN



Picture 2 - Fiona and Raymond with Shadowfax

Footnote:

After many happy hours of aviation with the ever faithful Shadowfax, a fortnight before the Fly In Paul's head was turned. He fell for a younger model, strangely enough with wider hips! I don't know if it was the younger model syndrome, or whether he just required more room. The Cad moved his affections to another. G-BWPS caught his eye, a 618 powered wide bodied Streak. The weird thing is he's meant to be dieting! I say meant to be, because I have accompanied Paul on some of his Sandown trips, and a very nice restaurant they have. Big helpings, and the Spitfire beer is to die for! Too much information, maybe? So Shadowfax was overlooked for the charms of a younger, racier, model. The truth is Lisa, I think he just wants more room to spread out.

So, G-MNXX is up for Sale. To partake in what is fast becoming a piece of aviation history, interested parties form an orderly

queue, ring the Shadow Flight Centre for full spec. and details, on 01722 410567

Hangar Alarm System

It is always a concern for aircraft owners who don't keep their aircraft on large airports where there is security, that their hangar may be broken into and items stolen and/or even worse, damage caused to the aircraft. It is often the case that there is no power or a telephone line in the hangar so installing a conventional alarm system is of little use.

End2End Software Limited has developed an alarm system that uses mobile phone technology to send text messages to one or more mobile phones in the event that activity is detected on any of its inputs. The system can operate on any one of the UK GSM networks requiring either a Pay As You Go, or a contract SIM card. All the UK mobile phone networks offer SIM only deals.

Called 'Tel-Me', the heart of the system is contained in a small aluminium box measuring 110mm x 110mm x 30mm and it has four inputs that can be connected to low power Passive Infrared Detectors (PIRs), magnetic door contacts, pressure mats etc. The system is powered by its own internal battery that will operate the system for up to one year from fully charged. With the addition of an optional small Solar Panel the system can operate indefinitely.

When activity is detected on any of the inputs, the system wakes up and sends the alarm text message to the mobile phone numbers that have been stored in its memory. Ten mobile numbers can be stored. The alarm text message gives the location name that has previously been stored together details of the input that has detected activity. Typically the first alarm message will arrive on a mobile phone 25 seconds after the input was triggered. The recipients of the alarm message can either cancel the alarm via a text message, or they can go to the hangar and apply an Electronic Security Key to the Reader, that is supplied as part of the system. If the system is fitted with the optional microphone, any one of the recipients can dial in to the system and 'listen-in'. Clearly if voices are heard or

unexplained sounds, it is reasonable to assume that a break-in has occurred. If a second input detects activity, another text message will be sent giving details of that input.

Programmed via text messages, the system sports a number of features including a daily message that confirms that the system is functioning. Included in the daily message is the signal strength that the system is seeing from the mobile phone network along with the system status, the voltage of the internal battery and the voltage of the external battery, if used. The basic system has one output that can be connected to an optional Sounder. In this case the external 12 volt battery is required.

As you might expect from an alarm system, a great deal of thought has been given to security. Only authorised mobile numbers i.e. those programmed into the system will receive the alarm text messages and only those mobiles can program and remotely control the system. The system uses a highly secure 'digital security key' entry system to disable the system when you arrive at the hangar and to enable it when you leave. The system can also automatically arm itself at a set time each day; say in the evening, ensuring that the system is not left disarmed overnight, when most break-ins occur.

Designed for self installation, the 'Starter Kit' comprises of a System Processor Unit with Antenna, a Remote Security Key Reader, one Electronic Security Key, one Low Power PIR, 6 metres of cable and a Warning Placard for fitting on the outside of the building, together with comprehensive installation and user instructions. The 'Starter Kit' is priced at £395.00 plus VAT. Optional extras include additional Electronic Security Keys, Audible Alarm Sounders, a Weatherproof Solar Panel, a Microphone and a Mains Adapter.

Not just confined to aircraft hangars, the system can be used in any situation where high value assets are kept in remote locations e.g. remote site offices/workshops, equestrian tack rooms, remote lock-up garages, holiday homes etc. In fact

anywhere, where there is a mobile phone signal.

Trade enquiries are welcome.

For further information contact:

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UK

Telephone: +44 (0) 1223 721828
Fax: +44 (0) 1223 512633
Email: sales@endtoend.co.uk

Website:
www.endtoend.co.uk/alarmsystem.htm

John Lord

Fly-ins 2006

The following destinations were planned for 2006

My own strip, in Norfolk. (Sunday 23rd April)

Unfortunately the weather was not kind to us, with the visibility less than I would have liked for a local flight, and as a result no-one felt able to make the trip to Norfolk.

I did have one phone call from a member who said that he had hoped to fly in.

Tibenham (Sunday 18th June)

The weather was hot, as it usually is for this event, but I was working that day, so was unfortunately unable to attend. I was actually working at the strip where I keep my aeroplane, so it was a little frustrating.

Another pilot from my strip went, in a Kitfox, and he told me that the air was very bumpy.

The Breckland strut's barbecue and cake stall is legendary, and they've been blessed with sunny weather for as long as I can remember.

www.brecklandstrut.co.uk

Henstridge (Sunday 16th July)

Members Paul Mogg and John Porter organised a brilliant fly-in to this airfield in Somerset. In the end 23 Shadows made it to

the airfield, making it our most successful fly-in for quite a long time. Many thanks to Paul and John for their efforts. Sadly, I was working on the day, so didn't make it. I've started planning the route for next year.

PFA Rally - Kemble (18th - 20th August)

The weather was very unkind to the PFA. Only 3 Shadows made it to the rally, out of a total attendance of only around 600 aircraft flying in. They were G-BXWR, G-BZWJ & G-MNXX.

Contributions

Many thanks to David Cook for his explanation of the Shadow wing section.

Many thanks to Paul Mogg and John Weston for their efforts in organising the fly-in to Henstridge, and for the report printed in this edition.

Someone else must have some interesting trip, picture, or story to share with us. It doesn't have to be in matchless prose, or even provided electronically, although it makes it easier to deal with if I haven't got to type it in. Some scribblings will do, as long as I can read them. (Please!)

If you'd like to organise a fly-in at your local airfield I'd be delighted.

Adverts

Apologies to those of you who are familiar with the web site, as these adverts are copied from there.

If any of these adverts are no longer valid, please let me know so that I can remove them. I have decided that, rather than leave the adverts on indefinitely, I will remove them if I've heard nothing for six months. If the advert is still valid then I will put it back on request. That way we will reduce stale adverts, which do no favours to any of us.

FOR SALE

(6/9/06)

Peter Bevan's Streak is still for sale. G-BUIL, Cook undercarriage, permit to 31/10/06, 317hrs total, 10hrs SMOH, including exchange crankshaft, includes custom trailer,

ANA headsets & intercom, radio, spares and Rotax tools. One fastidious builder/owner, always based at Perth. Extremely good condition, now £11,500.

Peter Bevan, 01738 560209,
pnbevan@blueyonder.co.uk



(Aug 2006) G-MNXX See the article on the Henstridge fly-in, earlier in this newsletter.

WANTED

(16/02/06)

Tony Halsall is looking for an approved ferry tank. He's also looking for a prop. for a 912 installation. Tony Halsall 07789 171553

Winter 2006 Newsletter

The Winter 2006 newsletter is due out in the last week of December.

THE

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Disclaimer - Opinions expressed by members in letters or articles do not necessarily match the opinions of the Shadow Owners' Club or its officials