



April 2013

# SKYWRITINGS

Newsletter of the **Kent**

## Kit building with the CAA



### Editorial

This month's talk is by Dr Bruce Alexander on his recently completed and permitted Rotorway 162 with updated engine as used in the latest 'Talon'.

Bruce is an AME based near Canterbury, actually not far from Howletts wild life park - and hailing from South Africa where he flew military helicopters and ran several clinics—the call of wild animals or flying over them must seem rather familiar. This month's newsletter has a comprehensive account of the build but there is plenty for Bruce to expand on during his talk.



Nigel Read - Editor

Martin's EASA licensing article in last months *Skywritings* resulted in a few queries. Just goes to show how confusing it can be. We may try to get someone from the CAA to explain at a latter date but I had some incorrect answers at PAFRA's recent talk. If it is a 'standard' conversion it should be straight forward but special cases with combinations of licences, ratings and medicals might need closer scrutiny as to validity periods. See *CAA information notice IN 2012-100*. The article did say errors to be expected! *Martin will at the next meeting if anyone has specific questions.*

Last month's talk was on the history of Biggin Hill by Bob Ogle with about 25 members attending and learning of some of the heroic acts that took place and to be weary of 'knockers' offering twenty quid for priceless medals!

With airfields drying out at last we can look forward to some flying at last with our strut scrambles. Make sure you keep us up to date with email addresses so these last minute fly-outs can be promulgated.

Don't forget suggestions for fly-outs, talks and visits.

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**Exec 162F(Modified) Kit Helicopter**  
**Cobtree Manor Golf Club, 20:00hrs**

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## Rotorway 162F (Modified)

Well, it has been a long time in the making and the bracketed part of the title is only a small part of the entire explanation.

Probably the most important reasons for the length of time from initially ordering the kit and getting flying can be put down to a busy job, a big family, and a share in a Luscombe; hence a general lack of urgency!

Not that doing things slowly is a bad thing - in fact even though my sloth-like pace meant even further delays due to bureaucracy, I ended up with a better helicopter than the one I originally ordered.

Whilst researching this article I thought I had better get my facts straight and so I went back to my records which showed that my application to the CAA for a permit to fly for G-ZHWH was dated 6<sup>th</sup> November 2001. My first flight in her was on the 26<sup>th</sup> October 2013....nearly 12 years in the making!

I do not think this is typical and although I have heard of folks building one in 3 months, the average seems to be about 3 years.

Due to financial and space constraints, when I purchased the kit I chose the staged kit (and payment) option. This allows you to buy the machine in 4 stages and get on with what you have. Herein lies the reason for my certification woes! Because I took so long completing the first 3 stages, by the time I took delivery of the last stage, which included the engine, FADEC and main rotor blades, Rotorway had discontinued production of the 162F engine, replacing it with the A600 Talon engine. This would not have been too much of a problem as the engines are essentially the same but they also changed the electronic engine management and monitoring system (FADEC) with a standard "off the shelf" unit in common use in the automotive industry.

To get back to the basics... I constructed the machine in my single garage into which the helicopter just fitted (without blades attached). When I needed to fit and balance the blades, I knocked out the end wall of the garage, moved the machine to Southern Helicopters at Takely (near Stansted) and with help from Paddy and friends, began the construction of my own HeliHome.

One of the key features of building a Rotorway is that you never assemble anything once only! Every stage is built, then taken apart, and then built again - often several times as the build progresses, but you eventually get to the stage where you can actually finish assemble! Because of this, you get very familiar with all the different bits.

The kit is well put together, the basic chromoly steel structures are jig welded at the factory and the fibreglass mouldings are provided gel coated in roughly the correct shape and dimensions, but somehow every time you take the machine apart and rebuild it, nothing seems to fit as it did last time!

All nuts, bolts, washers and extra bits are provided on numbered cards and all assemblies are numbered so that you learn that a certain number will refer to a specific assembly; for example, a body component, the tail rotor assembly, cooling system or drive train.

There are illustrated construction manuals as well as a set of (in my case, building in the dark ages) videotapes. I believe this info is now on DVD.

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The build process is probably much easier if you don't go for the staged program. I found that you get to some sections where you lack the bits to progress, so you have to skip sections in the manual and go back to them when you eventually get the parts...this sometimes takes "relearning" a previous section. However the advantage is that this cushions the financial outlay and if you are short of storage space, it makes for a practical solution.

I decided to have all the chromoly bits powder coated by a company in Margate who did a great job but this did mean transporting the entire structure on the roof of my car, which attracted many stares!

I painted all the other parts using 2-pack polyurethane in a spray booth I built in my garage. In order to make sufficient space to do this, I constructed a low level dolly which allowed me to trundle the otherwise completed helicopter (minus tail boom and main blades) around my garage.

At the time of delivery of each part of the kit, the local agents (David and Jonathan Bull of Southern Helicopters) carried out an inspection of the parts I had completed and signed them off.

Once I had "finished" putting it all together, the machine needed a final inspection with all the panels off. This was booked in and I was told to expect a day's work by the engineer with about 50 snags usually to be identified. Fortunately, he was only able to identify 13, which I then set about rectifying and few weeks later I was able to arrange transportation of my machine on a trailer, courtesy of Southern Helicopters to Takely for weighing, final paperwork and flight testing.

*Now some explanation of all the delays not caused by my own intransigence!*

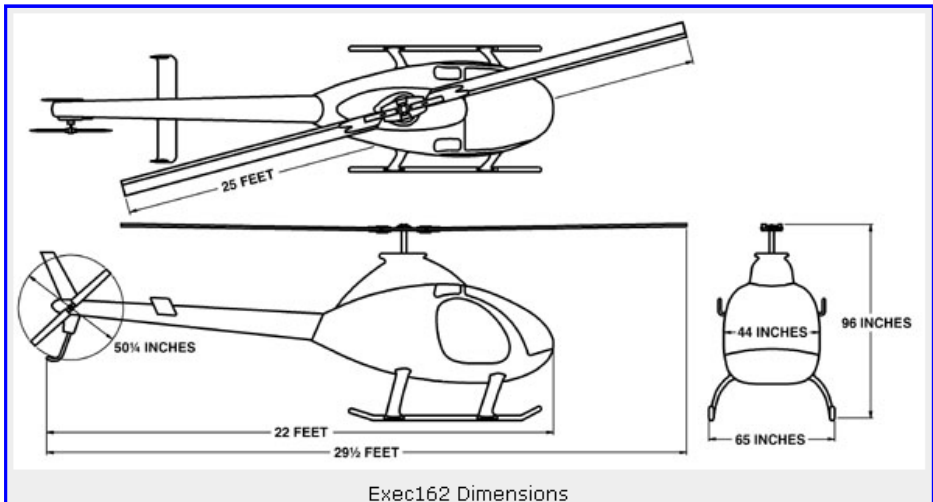
- The arrangement of the new engine and new FADEC system required a new wiring harness and a new instrument (MGL) to display the relevant engine management data. There are only two other 162s produced with this combination, and this would normally not have bothered me, except that nothing worked when I set it all up and wired it in according to the instructions provided. After numerous emails and phone calls I eventually had to make alterations to the previous wiring arrangement and was able to get the FADEC working, but not the MGL.
- Some 6 months later and more emails and phone calls to Arizona than I can remember I received a new MGL with updated software. Excitedly I proceeded to fit it to the aircraft (by this time it was up at Southern Helicopters). Still not working!! After a day of frustrating futile trouble shooting I abandoned my quest. Fortunately, the next day, the Bulls had an inspirational idea and connected the wiring harness in their Talon (under construction) directly to my MGL...bringing it to life! The problem was localized to a switch used to interrogate primary or secondary FADECs that I had incorrectly wired into the circuitry (...which had been wired according to the (hand drawn) diagram supplied!)

- We were now able to do engine runs and send paperwork to the CAA. Unfortunately the kind folk at the CAA decided they needed to treat my machine as a new model and so after 9 months of delays, multiple correspondence backwards and forwards and generally wondering if I would ever get to fly, our permit to test arrived...with the designation **Rotorway 162F (Modified)**

The next week G-ZHWH took to the air in the capable hands of John Jackson - a previous Rotorway owner who currently trains MOD pilots to fly helicopters. Several hours of hovering with breaks to trim the machine and sort out a minor oil leak and we were well on the way to getting paperwork back to the CAA and the issue of a Permit to Fly.

It was then onto my training program, then relocating WH to Manston for my type rating and eventually the big day came when I was able to fly WH home to her custom HeliHome at Bekebourne.

In summary, all the time and effort expended have been well worth the end result. Both instructors who have flown with me have commented on the good performance and handling characteristics of WH.



## Rotorway history

For those of you unfamiliar with the type, here is a bit of potted history (with acknowledgements to Wikipedia)

Rotorway began in 1961 when RotorWay's founder, B.J. Schramm, tested the company's first prototype, the Javelin which used a 40 hp (30 kW) motorcycle engine, and was the forerunner of RotorWay's first production helicopter, the Scorpion, offered in 1967.

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The Scorpion, priced at \$6,300 (not including the cost of the engine), was the first real kit helicopter on the market that flew. The Scorpion was intended for the sport-flying public, rather than the commercial market and this dictated the cost and weight of the aircraft. Originally, costs were intended to be under \$10,000 but inflation changed that. The original Scorpion weighed between 1200 and 1300 pounds. It featured a standard gear reduction drive, a semi-articulated two-bladed rotor system, and a one-person capacity.

An improved version of the Scorpion was introduced in 1971. Among the modifications in the new version were all-aluminum rotor blades, a 115 hp (86 kW) OMC 2-cycle engine (Evinrude Vulcan V-4 outboard motor) and a heavier drive system (shafts and bearings).

In 1971, the Scorpion II was introduced with an OMC 125 hp (93 kW), 2-cycle engine which provided enough power to fly two lightweight people.

In 1974, the company eliminated the 2-cycle engine and, unable to find a manufacturer to make their 4-cycle engine suitable for the helicopter, began production of their own engine. This engine, called the RotorWay RW 133, was a 4-cycle engine that was able to provide a cruise speed of 80 mph (130 km/h) with a range of 120 miles (193 km) and a useful load of 420 pounds.

The RW 133 engine was installed in the Scorpion II, which was renamed the Scorpion 133. The Scorpion 133 had a list price of \$13,500, a gross weight of 1,235 lb (560 kg), and a range of 130 nautical miles (79 nautical miles (146 km) with two people).

In 1980, RotorWay introduced the RW145 engine, and the Exec helicopter. This was the first helicopter produced by RotorWay that strived to get away from the "kit helicopter" look. Unlike previous helicopters, the Exec did not have an exposed frame or exposed engine and far more attention was given to the aesthetics of the aircraft.

1982 marked the introduction of the asymmetrical rotor blade, enabling the craft to climb to higher altitudes and making the blade resistant to erosion, but with a risk of losing the aircraft if the engine quit. The Elete helicopter was designed during the late 1980s, and had a 152 hp (113 kW) engine with a maximum payload of 400 pounds, cruise speed of 113 mph (182 km/h) and maximum airspeed of 130 mph (210 km/h). After selling just three Elete helicopters, the company succumbed to financial challenges and was purchased by a former customer, John Netherwood who stopped production of the Elete helicopter due to design hurdles and financial constraints on the company.

In 1990 RotorWay Aircraft underwent reorganization and changed its name to RotorWay International.

The design and production of the Exec series helicopters began in the early 1990s, starting with the Exec 90. The Exec 90 contained the RI 162 engine, and, unlike previous helicopter kits, much of the assembly, including the welding, was done at the factory. The Exec 90 was followed by the Exec 162F in 1994.

In July 2007, RotorWay announced the development of the A600 Talon. The A600 Talon features an updated FADEC system, an all-glass cockpit, a cog-belt replacing the primary drive chain, and a larger landing gear.

In February 2009, RotorWay purchased PMC Machining and Manufacturing, a

Phoenix-based builder of helicopter parts. The CEO of PMC, Mark Porter, became president and COO of RotorWay as part of the acquisition. The company also announced plans to certify a two-seat turbine helicopter using the Rolls-Royce RR300 engine and said that acquiring PMC will make that possible.


Although it is the third largest helicopter manufacturer in the United States, RotorWay has established a factory in South Africa that manufactures ready-made helicopters in addition to kits. RotorWay has also begun the process of expanding into the certified helicopter market and plans to make major changes, including the creation of a separate engine manufacturing company.

### Fly-in to Amiens 4th-5th May

Last year several strut aircraft flew to Amiens (see **SKYWritings** May 2012) and any one who would like to fly there and may need help with planning etc. contact any committee member who can put you in touch with the right man (or talk to him after the next meeting).

- Bring aviation enthusiasts, pilots and anyone interesting in aviation together in a relaxed aviation atmosphere to enable the sharing of experience.
- Offer the public the opportunity to see what AMIENS LFAY offers and learn more about aviation and its rich history (1909).
- All aircrafts welcome at Amiens friendliest Fly-In. No PPR.
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- Friendly dinner Saturday night at the airport.
- Hotel accommodation and restaurants in the local area.
- Food and drink available.
- No handling fee
- GA pilot briefing facility

[contact@aeroclub-picardie-amiens.com](mailto:contact@aeroclub-picardie-amiens.com)



### Popham Microlight Fair

Popham also have the microlight fair on 4-5th May with aero/auto-jumble on the 6th with classic vehicles.

### Fly-in to Stow Maries 11th-12th May

The following weekend, Stow Maries in Essex have their fly-in. The same issue of **SKYWritings** has a report on last year's meeting, the weather being not very kind. <http://www.stowmaries.com/>



They also have started a group, Friends of Stow Maries <http://www.fosma.co.uk/>

### On Line GAR Form

The on line General Aviation Report went active on the 8th April. A help list is included. <http://aopa.co.uk/Gar6/>



GAR form page [Send/Cancel page](#)

Entering details for: Kent Strut LAA

Save Aircraft reg:  Aircraft type:  Aircraft base:  Home Office

Recall: Owner/Operator/Hier: LAA Contact number:  Aircraft in free circulation:  Email: [Click to return to ADPA skywritings@tesco.net](mailto:skywritings@tesco.net) Local time:  UTC:

Outbound from UK  Check this box if submitting an outbound GAR Inbound to UK  Check this box if submitting an inbound GAR

Outbound date: 04/04/2013 UTC dep time: 00:00 ETE 00:00 Dep't date: 04/04/2013 UTC Dep time: 00:00 ETE 00:00

Dep't field:  Where from:  Arrival point:

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Clear all entries Add new crew/passenger Delete highlighted crew/pax Reload Last GAR Import crew/pax details

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## Flying Holiday — Steve Solley

My log book has never shown great excitement of great travels. Mainly enjoying flying local hops around East Kent. Sometimes however you can see where I have been when I have been in America and Canada.

This time after many visits to Portugal, I chanced my luck on an advert from a free map of Lagos. One phone call and I was booked in for the mid-day slot the following day. The centre consisted of a Pegasus, Float planes Microlight and a pioneer P200. Not much of a checkout, then met my instructor, David Norwood and pulled the P200 out into the open sun. We took off due west and circled the town to take some pictures and continued west down the coast to Cape St Vincent. Once clear of Lagos we were clear to climb above 1000ft from under the Faro control zone.

David pointed out that the area was similar to the West Country here at home in England with the beautiful coves and beaches and the hinterland being Dartmoor.

In the distance was Sargres and to the right Cape St Vincent the most westerly point in Europe. Heading out to sea—next stop America, we turned to have a good look at the coast line, heading north and still climbing to 3000ft to keep clear of the Monchique Mountains.

The views were stunning and with the sun behind us you could see for miles.

Unfortunately time was passing very quickly my hour was nearly at an end so we were now dropping back to 1000ft towards Portimao and back along the coast to Lagos and into land.

The P200 behaved itself giving me a pleasant flight and experience

Something more to put in my log book and another different plane flown.



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- 11th-12th May Stow Maries fly-in
- 30th May Design of the Kestrel—  
 Brian Tutty
- 27th June Ripple BBQ
- 25th July Rochester BBQ
- 28th July Stow Maries -  
 Photographers day
- 29th Aug Treasure Hunt
- 26th Sept Max Couch
- 31st Oct Turbulent display team
- 28th Nov RAF fighter pilot to 777