THE STREAK

Professional pilot Bob Grimstead tells the story of David Cook's quest to produce 'The perfect, maximum pleasure, minimum weight aircraft'

After a quick six-minute assembly, the bright red aeroplane's nose-wheel gently nodded to the ground as designer David Cook eased his weight into its cockpit. The four-bladed prop sung into life and the aircraft turned and briskly taxied to the far side of the tiny (150 by 190 yard) local cricket pitch, swivelled into wind, accelerated better than any sports car (0 to 60 in 3.7 seconds) and was airborne in perhaps ten paces, and climbing like stink.

By the upwind fence the Streak Shadow was hundreds of feet high, still climbing strongly and at an apparently impossible angle. A spirited show followed, tight turns, slow orbits, swift high speed swoops, an Airbus-rivalling flaps-down pass under complete control at below walking-pace, glide approaches and zoom climbs.

The eventual landing might have been called short, had it not been undersize for that category, the machine's nose briefly seeming to bury itself in the greensward as it stopped so sharply. But, before we onlookers had time to gasp in amazement, with a quiet howl of power the nose-wheel lifted back off the ground and the unconventional aircraft was airborne again, in a performance begging re-definition of the term STOL.

At fifty feet a wing dipped and this brilliantly agile aeroplane completed a circuit barely beyond the boundaries of the small fenced square of grass, to land and turn in less time than it takes to read the words.

On leaving the Air Force, David Cook, designer of the Shadow family, set about combining his knowledge, experience and desires to produce 'The perfect, maximum pleasure, minimum weight aircraft.'

To save weight, the crew's seats are part of the structure. He uses a side stick, because your arm is on your side, and the fuel cock obstructs the big throttle when turned off.

Since he was producing an aircraft for anybody to fly, his safety-minded approach included deliberately increasing aileron forces and reducing the original roll-rate. This can be restored by a simple modification if David thinks the owner will be able to cope. The flap handle is also intentionally made hard to move when above the limit speed.

UNORTHODOX

At first David was seduced by the promises of CIBA Geigy's Fibrelam, using it for most of his prototype's primary structure. In late 1981 Shadow 001 flew - just. He recalls the occasion sardonically, "It handled like a rubber band!" The experience reinforced his belief that very few people in this world really know what they are talking about.

After demonstrating the airframe's elasticity to CIBA Geigy's experts he started Shadow 002 which flew, this time very successfully, a year later. He now derides those who preach the exclusive use of any particular structural medium.

Having always been fascinated by materials, David insists on the most appropriate one for each application. His Shadow family has components of aluminium, steel, stainless steel, ply, pine, Fibrelam, fibreglass, nylon, expanded polystyrene and polycarbonate. He uses unorthodox off-the-shelf components wherever possible including flagpole pulltrusions for the undercarriage legs, hospital trolley tyres and plastic tea strainers for fuel filters.

READY FOR MASS PRODUCTION

Since that first flexible prototype, all airframes have had a main spar of 1.2 mm ply with rivetted and bonded top hat section aluminium caps. This slender member is braced by its styrofoam ribs to yield a near-impossible 87 to one strength to weight ratio, but none has ever failed. David considers that plywood out-performs all modern composites for stiffness-to-weight at a quarter to a tenth of the price, while the extruded channel was made for truck bodywork so it's dirt cheap. Keeping the thin ply vertical with the ribs is what gives the spar its strength.

British Civil Airworthiness Requirements (BCAR) Section S (microlight) rules stipulate a maximum empty weight of 150 kg, but simultaneously demand a strength of +6 and 3g. This is a hell of a requirement. David's was one of very few two-seaters to meet the specification, and it has since coped with 7.2g. In comparison post-war American two-seaters weigh more than twice as much, with lower +4.4/-3.8 g-limits.

In 1984 the microlight Shadow was ready for mass production. The type first hit the headlines by exceeding its class FAI world speed and distance records by a full 50 per cent.

In 1990 David broke the UK microlight altitude record at 23,800 feet. More recently CFM made a special hands-off Shadow for famous paraplegic ex-RAF helicopter pilot Trevor Jones. Current D series Shadows have wider cockpits and a 64 hp Rotax 582 engine with a Vne of 112 knots.

The developed Streak Shadow is a higher-powered, clipped-wing, Shadow-based kit-built 'proper' PPL (A) light aircraft which is certified under a PFA Permit to

SHADOW

The Streak Shadow's unconventional designer, David Cook

Fly. Its thinner, shorter wing gives a 100 mph cruise, a 31 mph stall, and a 30 metre take off and landing roll. The company quotes a build time of 500 hours although some do it in 300 and a disabled German built one from his wheelchair.

RECORD BREAKER

Having climbed a standard Streak to 8,250 metres (27,000 feet), David maintains it is the only aircraft to hold records in speed, distance and altitude concurrently. In 1994, also in an un-modified Streak, with an admittedly lightweight 38 kilogram passenger, he broke the world class time to climb record to 3,000 metres (9,800 feet) in eight minutes, 55 seconds. He claims no other Rotax powered aircraft will touch a Streak Shadow in any aspect of performance, and delights in accepting head to head challenges to prove it.

When I sampled the well-used Streak Shadow prototype G-BONP, I thought it the most safely abusable of the 150 odd types I have flown. I had never before experienced such a care-free aircraft. It was simple to fly, had excellent visibility and one could ignore both the ASI and any stalling worries. You just point it where you want to go. Even the CAA's test pilot was unable to stall or spin it, despite making a real effort.

Indeed, for me David demonstrated a complete circuit with the stick held hard against the back stop. We took off in around 100 metres and climbed steeply to 1,000 feet, where he throttled back so we flew level, but nose high, around the circuit. Then he throttled back further to descend on final to a safe touchdown and a short landing roll. No drama, no fuss. Try that in any other aircraft! On second thoughts, whatever you do, don't try it in any other aircraft!

PANORAMIC

I flew the Streak both dual and solo. The cockpit is comfortably snug, all current models are now nearly two inches wider with a semi-reclined seating position under a side-hinging unbreakable polycarbonate canopy. You soon get used to easing the nose to the ground with your weight as you step aboard.

The side-stick and throttle fall neatly to hand and the engine is simple to start with the recoil starter from beside the aircraft. It is easy to taxi, using the castoring nose wheel and excellent brakes, making it nicely manoeuvrable. The Streak has a maximum 25 kt crosswind limit, and I flew with a steady 15 knots directly across the runway, without any problems. With a

buzz of power it accelerated briskly, leaping off the ground with a positive rotation at 50mph after a very short run of perhaps 100 metres. Then you quickly remove the back pressure to establish the climb.

The aeroplane climbs eagerly at around 1,100 fpm dual and over 1,500 fpm solo at 60mph. Visibility is truly excellent, completely panoramic in all directions and rivalling a glider's.

The aircraft is stable in the cruise, flying hands off from 75 to 100mph without any inputs, thanks to the electric elevator trim. Top speed is 120 mph and 5,500 rpm gave me 85 mph at 1,500 feet for a consumption of perhaps 12 litres per hour. This gives a 400 mile range or four and a half hours safe endurance. The control forces are reasonable, although the ailerons could be lighter, especially at higher speeds. The roll-rate is OK but at four to five seconds to reverse a 45-degree bank, it could also be improved. The original Streak, with a longer span, has a lower roll rate.

IMMENSE FUN

With no real definable stall, the minimum possible flying speed, with power, is around thirty knots, with the nose tilted impossibly skywards. Having so little inertia, it does not accelerate much when you head downhill, and so will go where you point it. I experimented with both high and low glide approaches and had little difficulty simply aiming where I wanted to go.

ABOVE: The author taxiing out with David Cook for his check-out

BELOW: The Streak Shadow jumps off the runway in no distance

The Streak's flaps are hardly necessary and the handle perhaps a little awkward to reach, but they do usefully increase the descent angle which can be further steepened by a side-slip. The Streak is tolerant to a variety of speeds on finals, glide approaches being just as easy as powered ones.

In view of the wind I flew at sixty mph, but speeds down to forty are quite feasible. Landing is very simple, with plenty of control authority to push off the drift and hold off the nose wheel for a good slow touchdown. Roll-out without brakes is perhaps a couple of hundred metres, and half that with them. Touch and goes are a cinch, with near immediate lift-off after applying power again.

My final verdict of 'Extreme ease of control, with a great feeling of safety and most importantly, immense fun' was underlined by David's need to send my wife Karen out on to the runway, waving her arms to make me land and finish the detail. I could happily have gone on and on all day.

CFM STREAK SHADOW

DIMENSIONS:	
Length	21 ft
Height	5 ft 9 in
Wing span	28 ft
Wing area	140 sq ft
WEIGHTS AND LOADINGS:	
Equipped empty	388 lb
Max weight	900 lb
Useful load	512 lb
Max fuel	54 lts
Max wing loading	6.4 lb/sq ft
Max power loading	14 lb/hp
MANUFACTURER'S STATED PERFORMANCE:	
Vne	140 mph
Max speed	121 mph
Max cruise	100 mph
Economy cruise	75 mph
Stall	35 mph
Max range	400 sm
S L climb rate	1,100 fpm
Ceiling	29,000ft

ENGINE: Rotax 582, twin cylinder, dual ignition, 64 horsepower two-stroke.

PROPELLER: Three blade, fixed-pitch, laminated wood 52 in by 55 in.

MANUFACTURER: CFM Metal-Fax Ltd, Unit 2D, Eastlands Industrial Estate, Leiston, Suffolk, IP16 4LL, England. Tel: 01728 832353 or 833076. Fax: 01728 832944.

PRICE: Basic kit, less engine and propeller: £10,750 plus VAT.

The rear seater will find it slightly more difficult to board. He has rather less room, a restricted upward view and suffers a somewhat higher noise level, but Karen enjoyed her twenty minute flight with David, saying that, after eight years of getting airborne with me in other lightplanes, "This is what flying should really be like."

NEW PROJECT

Thanks to customer demand, David's latest project is a side-by-side version of the Streak Shadow, using an aluminium honeycomb composite monocoque developed by race-car manufacturer, Lola. But this is currently delayed by funding problems and the authorities' refusal to accept it as a modification of the original. They insist on calling it a new design, requiring all the attendant testing and certification. I predict that if he is able to complete this aircraft to his own exacting standards, it will turn out to be more popular than its progenitor. The result should be a winner, and I would genuinely consider building one.

Although unconventional in appearance, David Cook's designs are definitely in a class of their own, and some of the most exciting I have encountered. If you get the chance, fly one. ✝