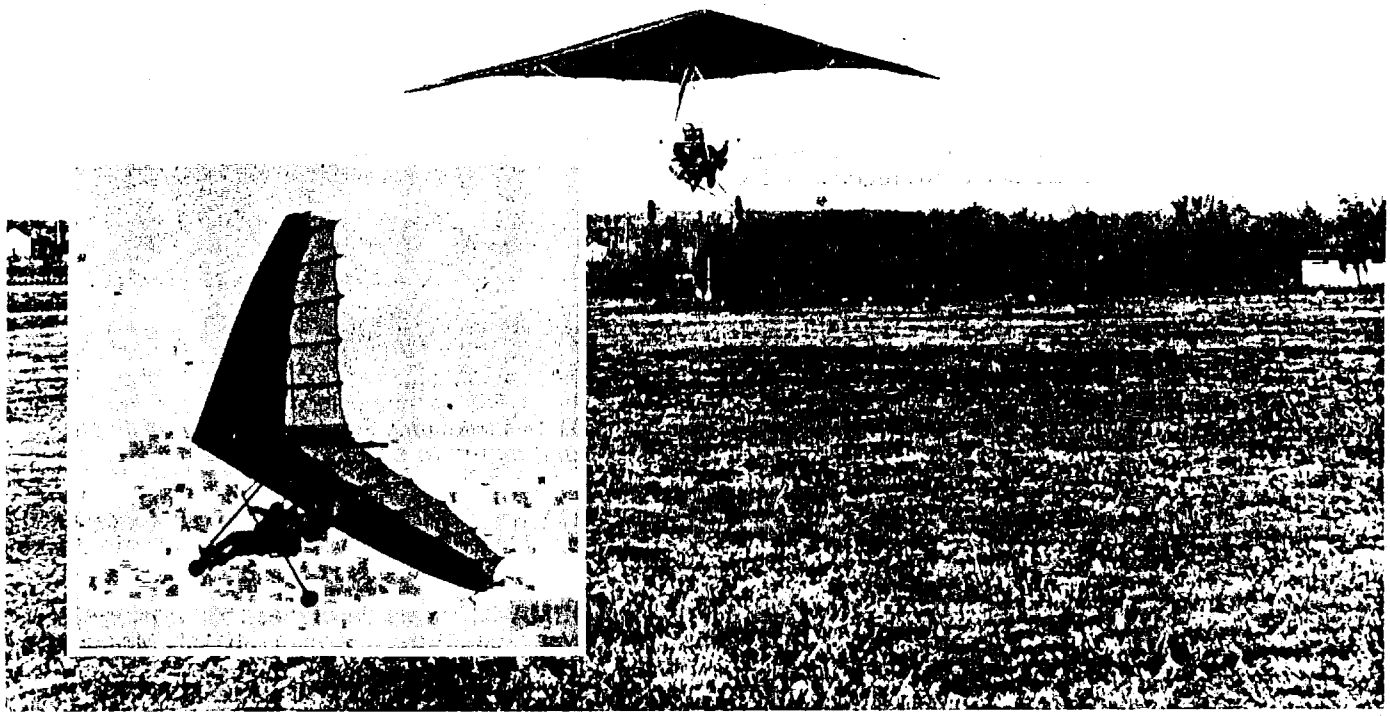


figures for *Safari GT Bi/Quartz 20* are shown in parentheses.

**EXTERNAL DIMENSIONS & AREAS** - Length overall 13.1 ft, 4.00 m. Height overall 11.5 ft, 3.50 m. Wing span 32.8 ft, 10.00 m. Chord at root 9.8 ft, 3.00 m. Chord at tip 3.3 ft, 1.00 m. Dihedral 4(6)°. Nose angle 120(122)°. Depth of keel pocket NC. Total wing area 214 ft², 19.8 m². Keel pocket area NC. Aspect ratio 5.1/1. Wheel track 5.9 ft, 1.80 m. Wheelbase 5.9 ft, 1.80 m. Nosewheel diameter overall 16 inch, 40 cm. Main wheels diameter overall 16 inch, 40 cm.

**POWER PLANT** - Rotax 447 engine. Max power 42 hp at 6500 rpm. Propeller diameter and pitch 59xNC inch, 1.50xNC m. Gear reduction, ratio 2.6/1. Max static thrust 287 lb, 130 kg. Power per unit area 0.20 hp/ft², 2.1 hp/m². Fuel capacity 6.1 US gal, 5.1 Imp gal, 23.0 litre.

**WEIGHTS & LOADINGS** - Empty weight 287 lb, 130 kg. Max take-off weight 795 lb, 360 kg. Payload 508 lb, 230 kg. Max wing loading 3.71 lb/ft², 18.2 kg/m². Max power loading 18.9 lb/hp, 8.6 kg/hp. Load factors NC recommended; +6.0, -3.0 ultimate.

**PERFORMANCE*** - Max level speed 50(56) mph, 80(90) kph. Never exceed speed 62 mph, 100 kph. Max cruising speed 44(50) mph, 70(80) kph. Economic cruising speed 31 mph, 50 kph. Stalling speed 22(23) mph, 35(37) kph. Max climb rate at sea level 690 ft/min, 3.5 m/s. Min sink rate 410(450) ft/min at 24(26) mph, 2.1(2.3) m/s at 40(42) kph. Best glide ratio with power off 7(8)/1 at 26(28) mph, 43(45) kph. Take-off distance 100(115) ft, 30(35) m. Landing distance 130 ft, 40 m. Service ceiling 9840 ft, 3000 m. Range at average cruising speed 156 mile, 250 km. Noise level NC.

**Under the following test conditions* - Airfield altitude 426 ft, 130 m. Ground temperature 68°F, 20°C. Ground pressure 1010 mB. Ground windspeed 0 mph, 0 kph. Test payload 309 lb, 140 kg.

*Air Creation's* Safari GT Bi *trike unit can be had with a* Quartz 20 *wing (main picture) or an* Alphaplus 20 *(inset).*

# AVIASUD

**Aviasud Engineering, domaine de la Suviere, route de la Bouverie, 83480 Le Puget-sur-Argens; tel (94) 40 0480. Proprietors: Francois Goethals and Bernard d'Otreppe.**

**British agent: Midland Ultralights (see separate listing).**

**South African agent: Aviation 2000 (see separate listing).**

**US agent: Aviasud Ultralights, PO Box 89, Beasley, Texas 77417; tel (409) 387-2226.**

## AVIASUD *SIROCCO*

**(Three-axis)**

*Single-seat single-engined high-wing monoplane with conventional three-axis control. Wing has swept back leading and trailing edges, and constant chord; conventional tail. Pitch control by fully flying tail with trim antitab; yaw control by fin-mounted rudder; roll control by 40%-span spoilerons; control inputs through stick for pitch/roll and pedals for yaw. Wing braced from above by kingpost and cables, from below by cables; wing profile TK7315M; 100% double-surface. Undercarriage has three wheels in tricycle formation; glass-fibre suspension on all wheels. Push-right go-right nosewheel steering independent from yaw control. Nosewheel brake. Composite-construction airframe, partially enclosed (total enclosure optional). Engine mounted below wing, driving pusher propeller.*

*Production status: current, 110 completed.*

**GENERAL** - This company was formed by Francois Goethals and Bernard d'Otreppe to manufacture and market the first model of Bernard Broc's three-axis single-seater *Libellule* (dragonfly in English). This aircraft went into limited production (three a month) at the start of November 1981 as did the *Mk III* model which was described in our first edition under Broc. (Bernard is still active in his own right with a quite different design, as you can read under Broc.)

In January 1983 the *Libellule* was superseded at Aviasud by the *Sirocco* which made its first flight on 26 July 1982. It was designed by Francois and Bernard using a computer to calculate exact loadings. Despite its similar configuration to the the original *Libellule* and its original title of *Libellule Mk II*, this was in effect a completely new aircraft. Francois is a specialist in fluid mechanics and Bernard in the study of composite materials and they therefore subjected the *Sirocco* to a very comprehensive series of tests, both static and in-flight. In particular these enabled them to optimise the use of Paul McCready's American TK7315 wing section with 14% thickness and to test the wing to destruction at +6.7g, -3.6g at full load.

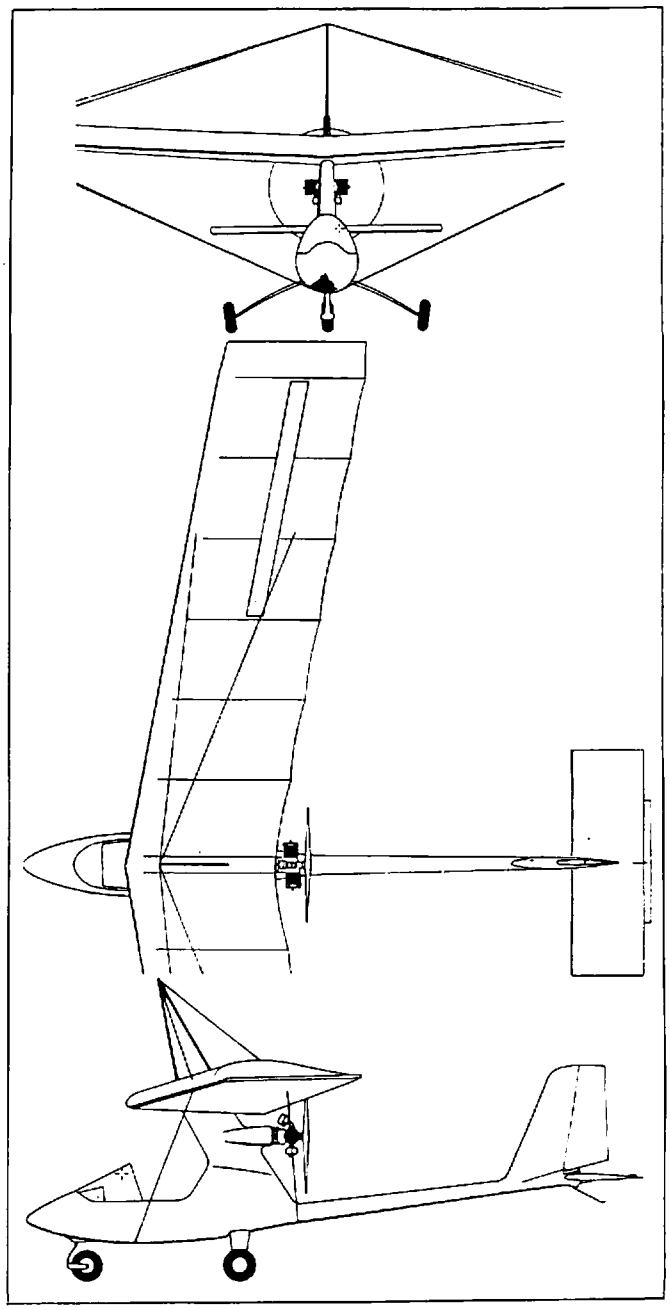
The single-seat *Sirocco* quickly found its place among the ultralight nobility, emerging victorious from nearly every European competition it entered. Its prize list includes first places in the 1983 French Grand Prix, the 1984 French championships (flown by Patrick Fourticq) and the French Grande Course of the same year with Francois Goethals at the controls, while in the US it won the Most Outstanding Design Award at Oshkosh '83. An undoubted export success, about 15 countries are now flying the *Sirocco*, including most European nations, Australia, South Korea and the USA.

During 1984 the *Sirocco* swapped its JPX PUL425 engine, as detailed in our first edition, for the Rotax 377 with gear reduction. At the same time it was given a new spring system for the undercarriage and an optional integral enclosed canopy. In Britain the aircraft is built under license by Midland Ultralights to a somewhat different specification, as required by UK airworthiness regulations. The American market is supplied from France, a three-cylinder Konig engine being fitted for this application. Our data below refers to the French version with standard tank (double size is optional); where different, figures for the US version are shown in parentheses. The British version is listed separately, under Midland Ultralights.

Those wanting to read more about the *Sirocco* have plenty of choice. French-language reports have appeared in *UlmMag* in July 1983 and March 1984, while reports in English have appeared in the EAA's publication *Ultralight* (November '83) and in the BMAA's magazine Flightline (March-April '85), the latter report being of the British version.

With good glide angle, well co-ordinated control response, exceptional stability and manoeuvrability, the *Sirocco* can legitimately claim to be the best European-designed single-seater generally available at the price, which is 77,920FF including tax. In the US, it is priced at US$9305 ready to fly.

**EXTERNAL DIMENSIONS & AREAS** - Length overall 19.0 ft, 5.80 m. Height overall 8.9 ft, 2.70 m. Wing span 33.2 ft, 10.12 m. Constant chord at root 4.6 ft, 1.38 m. Dihedral 1°. Sweepback 10°. Elevator span 7.2 ft, 2.20 m. Fin height 3.3 ft, 1.10 m. Total wing area 151 ft², 14.1 m². Total spoileron area 6.9 ft², 0.64 m². Fin area 4.3 ft², 0.40 m². Rudder area 4.1 ft², 0.38 m². Total elevator area 15.6 ft², 1.45 m². Aspect ratio 7.3/1. Wheel track 5.9 ft, 1.80 m. Wheelbase 6.1 ft, 1.85 m. Nosewheel diameter overall 13 inch, 32 cm. Main wheels diameter overall 13 inch, 32 cm.



*General arrangement of the original* Sirocco, *with JPX PUL425 engine. For an illustration of the* Sirocco *in flight, see colour section.*

**POWER PLANT** - Rotax 377 (Konig SC430) engine. Max power 35(27) hp at 6600(4600) rpm. Propeller diameter and pitch 57(55)x33(24) inch, 1.45(1.40)x0.85(0.61) m. Gear (no) reduction, ratio 2.6(1.0)/1. Max static thrust 232(150) lb, 105(68) kg. Power per unit area 0.23(0.18) hp/ft², 2.5(1.9) hp/m². Fuel capacity 5.3 US gal, 4.4 Imp gal, 20.0 litre.

**WEIGHTS & LOADINGS** - Empty weight 287(252) lb, 130(114) kg. Max take-off weight 552(544) lb, 250(247) kg. Payload 265(292) lb, 120(132) kg. Max wing loading 3.66(3.60) lb/ft², 17.7(17.5) kg/m². Max power loading 15.8(20.1) lb/hp, 7.1(9.1) kg/hp. Load factors NC recommended; +6.7, -3.6 ultimate.

**PERFORMANCE*** - Max level speed 71(63) mph, 115(101) kph. Never exceed speed 75(71) mph, 121(115) kph. Max cruising speed 68(NC) mph, 110(NC) kph. Economic cruising speed 50(NC) mph, 80(NC) kph. Average cruising speed NC(60) mph, NC(97) kph. Stalling speed 28(24) mph, 45(39) kph. Max climb rate at sea level 980(500) ft/min, 5.0(2.5) m/s. Min sink rate 310(NC) ft/min at 34(NC) mph, 1.6(NC) m/s at 55(NC) kph. Best glide ratio with power off 11(12)/1 at 40(NC) mph, 65(NC) kph. Take-off distance 115(NC) ft, 35(NC) m. Landing distance 165(NC) ft, 50(NC) m. Service ceiling 19,680(NC) ft, 6000(NC) m. Range at average cruising speed 156(177) mile, 250(285) km. Noise level NC.

**Data on Konig-engined machine obtained under unspecified test conditions. Data on Rotax-engined version obtained under the following test conditions* - Airfield altitude 0 ft, 0 m. Ground temperature 59°F, 15°C. Ground pressure 1013 mB. Ground windspeed 0 mph, 0 kph. Test payload 220 lb, 100 kg.

## AVIASUD *SIROCCO BIPLACE*
**(Three-axis)**

*Side-by-side two-seat single-engined biplane with conventional three-axis control. Wings have swept forward leading and trailing edges, and constant chord; conventional tail. Pitch control by fully flying tail; yaw control by fin-mounted rudder; roll control NC; control inputs through stick for pitch/roll and pedals for yaw. Wings braced by struts and transverse X-cables; wing profile NACA 2412; 100% double-surface. Undercarriage has three wheels in tricycle formation; glass-fibre suspension on all wheels. Push-right go-right nosewheel steering connected to yaw control. Brakes on main wheels. Composite-construction airframe, with pod. Engine mounted between wings, driving tractor propeller.*

*Production status: see text.*

**GENERAL** - Aviasud does not intend to rest on its laurels and 1985 will see the appearance of two new models to make up a range of products: the side-by-side two-up version of the
Sirocco, a biplane which began its test flight programme in February 1985; and the *AP 100 Alize*, a composite-construction tandem two-seater flexwing which made its first flights at the end of 1984. An agricultural version of the latter is already on the drawing board.
Although still at prototype stage at the time of writing, both aircraft were due to have their public unveiling and market launch at the Salon International de l'Aeronautique et de l'Espace at Paris' Le Bourget aerodrome in June 1985. We give below the data so far released on the biplane; readers should note that the wing size and engine type may be changed before production and that the performance figures are only calculations. Details of the *AP 100 Alize* we list separately.
Prices: NC.

**EXTERNAL DIMENSIONS & AREAS** - Length overall 19.3 ft, 5.90 m. Height overall 7.1 ft, 2.15 m. Wing span 30.7 ft, 9.35 m (bottom); 30.7 ft, 9.35 m (top). Dihedral 3° (bottom wing); 3° (top wing). Sweepforward 5°. Elevator span 9.2 ft, 2.80 m. Total wing area *216* ft², *20* m². Aspect ratio *8.7/1* (bottom wing); *8.7/1* (top wing). Wheel track 5.6 ft, 1.70 m. Nosewheel diameter overall 13 inch, 33 cm. Main wheels diameter overall 13 inch, 33 cm. Other data NC.

**POWER PLANT** - *Rotax 462* engine. Max power 52 hp at 7200 rpm. Propeller diameter and pitch 66xNC inch, 1.67xNC m. Gear reduction, ratio 2.6/1. Max static thrust NC. Power per unit area *0.24* hp/ft², *2.6* hp/m². Fuel capacity 10.6 US gal, 8.8 Imp gal, 40.0 litre.

**WEIGHTS & LOADINGS** - Empty weight 358 lb, 162 kg. Max take-off weight 861 lb, 390 kg. Payload 503 lb, 228 kg. Max wing loading *3.99* lb/ft², *19.5* kg/m². Max power loading 16.6 lb/hp, 7.5 kg/hp. Load factors +3.8, -1.5 recommended; +5.7, -2.3 ultimate.

**PERFORMANCE*** - Max level speed 87 mph, 140 kph. Never exceed speed 106 mph, 170 kph. Stalling speed 31 mph, 50 kph. Max climb rate at sea level 690 ft/min, 3.5 m/s. Service ceiling 13,120 ft, 4000 m. Range at average cruising speed 248 mile, 400 km. Other data NC.

**Under unspecified test conditions.*

## AVIASUD *AP 100 ALIZE*
**(Weight-shift)**

*Tandem two-seat single-engined flex-wing aircraft with weight-shift control. Rogallo wing. Pilot suspended below wing in trike unit, using bar to control pitch and roll/yaw by altering relative positions of trike unit and wing. Wing braced from above by kingpost and cables, from below by cables; 80% double-surface. Undercarriage has three wheels in tricycle formation; glass-fibre suspension on all wheels. Push-right go-left nosewheel steering independent from aerodynamic controls. Nosewheel brake. Composite-construction trike unit, with pod. Engine mounted below wing, driving pusher propeller. Other details NC.*

*Production status: see* Sirocco Biplace *text.*

**GENERAL** - See *Sirocco Biplace.*

**EXTERNAL DIMENSIONS & AREAS** - NC.

**POWER PLANT** - Rotax 447 engine. Max power 42 hp at 6500 rpm. Propeller diameter and pitch 57x37 inch, 1.45x0.95 m. Gear reduction, ratio 2.6/1. Max static thrust 276 lb, 125 kg. Power per unit area NC. Fuel capacity 6.6 US gal, 5.5 Imp gal, 25.0 litre.

**WEIGHTS & LOADINGS** - Empty weight 287 lb, 130 kg. Max take-off weight 733 lb, 330 kg. Payload 442 lb, 200 kg. Max wing loading NC. Max power loading 17.5 lb/hp, 7.9 kg/hp. Load factors NC recommended; +6.0, -3.8 ultimate.

**PERFORMANCE** - NC.

# AVULNOR

**Avulnor SARL (Aviation Ultralegere de Normandie), aerodrome de Granville-Breville, 50290 Brehal; tel (33) 90 6513.**

## AVULNOR *VECTOR 627SR*
**(Three-axis)**

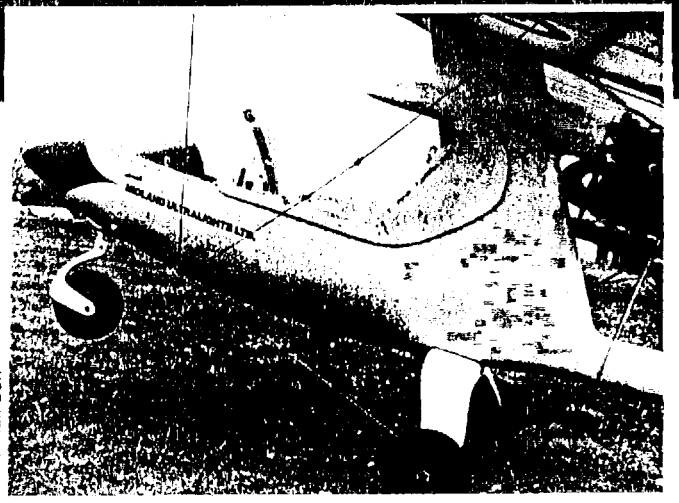
*Summary as Sky King* Vector 627SR *(see Canadian section).*

*Production status: current, number completed NC.*


Eastern Airsports HG&MC

# MIDLAND ULTRALIGHTS

Midland Ultralights Ltd, Kilworth Marina, North Kilworth, Lutterworth, Leics LE17 6JB; tel 0858 880484; tx TANGO G 342251. Chief executive: Derek Hucker. Director and test pilot: Iain Barr.



Norman Burr

*Main picture: BMAA chief executive Brian Cosgrove tries the* Sirocco 377GB *for size at the 1984 Norfolk Air Race, while Iain Barr looks on. Inset: At the 1985 Popham Trade Fair, Midland Ultralights showed this optional canopy. For an illustration of the French version in flight, see colour section.*

## MIDLAND ULTRALIGHTS *SIROCCO 377GB*

**(Three-axis)**

*Summary as Aviasud* Sirocco *(see French section).*

*Production status: current, 6 completed.*

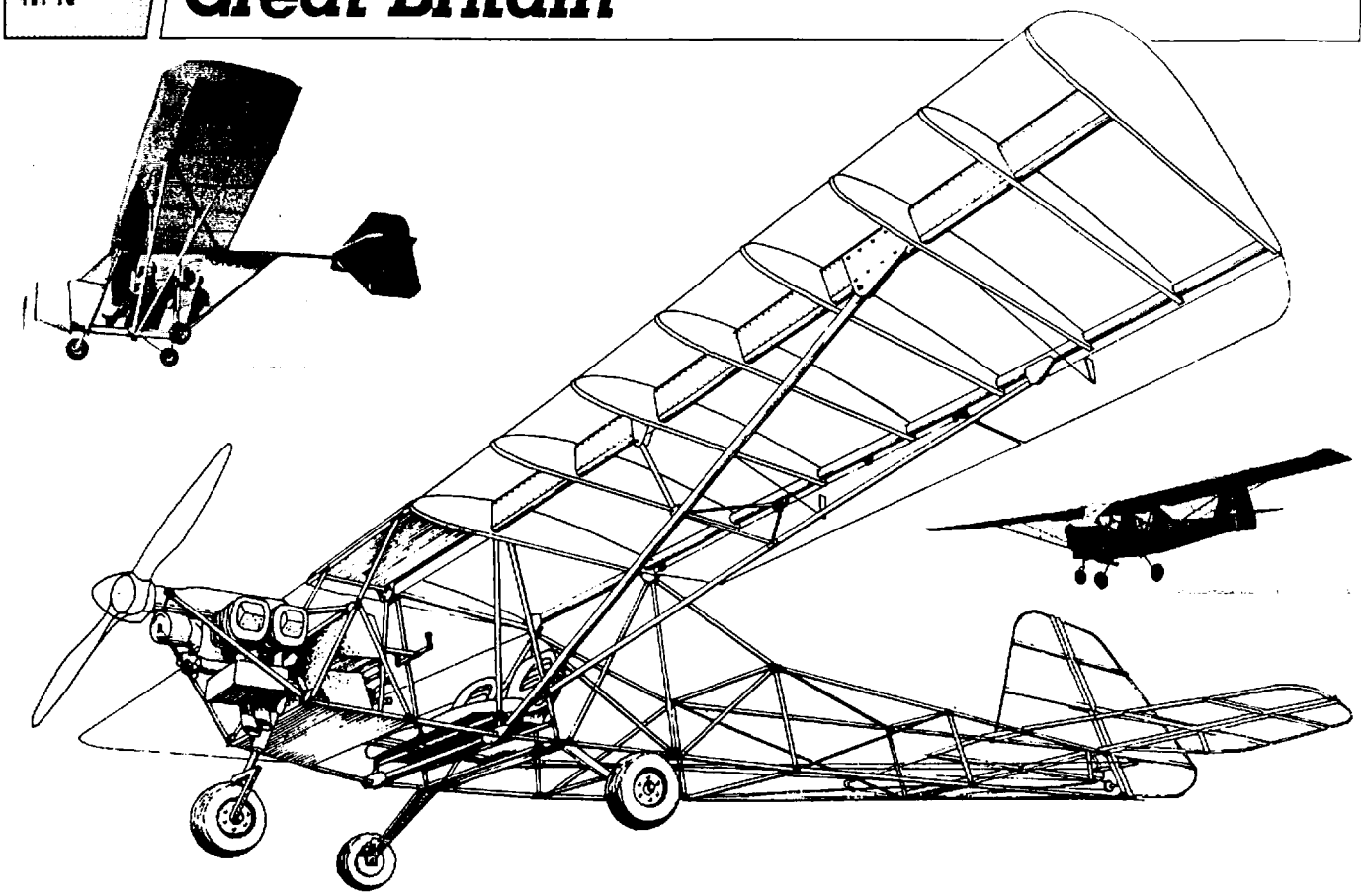
**GENERAL** - Midland Ultralights builds the Aviasud *Sirocco* under license and at first sight the British machine could easily be mistaken for its French cousin. However, many subtle alterations have had to be made to satisfy UK airworthiness regulations, which have resulted in a more robust but slightly heavier machine, appropriately retitled *Sirocco 377GB*.

Principal changes to the airframe are a different nosewheel mounting (the original is designed to sheer in a very heavy landing, but the UK authorities took a dim view of this idea), stops on the controls, different pedals, thicker control and trim-operating cables, a piano hinge on the trim tab, and thicker leading-edge cables, up from 2 mm to 5 mm diameter. The power pack has received attention too, with an extra silencer added, fuel drains and taps, and a sight gauge protected by a sleeve.

Price: £5600 ready to fly.

**EXTERNAL DIMENSIONS & AREAS** - See Aviasud *Sirocco* (French section).

# Great Britain



Snowbird *evolution: main picture shows cutaway of latest version; insets show same machine flying and a model of the original open-cockpit design.*

## NOBLE HARDMAN

**Noble Hardman Aviation Ltd, Penbidwal House, Pandy, Gwent NP7 8EA; tel 087382 367; tx 437269. Managing director: David Hardman. Designer: Dr David Noble. Engineering director: Philip Noble.**

**French agent: GH Aviation, 1713 Notre Dame, 06220 Golfe-Juan; tel (93) 63 6351; tx 470776. Contact: G H Humpheries.**

## NOBLE HARDMAN ***SNOWBIRD***

**(Three-axis)**

*Side-by-side two-seat single-engined high-wing monoplane with conventional three-axis control. Wing has unswept leading and trailing edges, and constant chord; flaps fitted; cruciform tail. Pitch control by elevator on tail; yaw control by fin-mounted rudder; roll control by half-span ailerons; control inputs through stick for pitch/roll and pedals for yaw. Wing braced from below by struts; wing profile NACA 4412; 100% double-surface. Undercarriage has three wheels in tricycle formation; coil-spring suspension on nosewheel and bungee suspension on main wheels. Push-right go-right nosewheel steering connected to yaw control. Brakes on main wheels. Aluminium-alloy tube airframe, totally enclosed. Engine mounted below wing, driving tractor propeller.*

*Production status: prototype.*

**POWER PLANT** - Rotax 377 engine. Max power 35 hp at 6750 rpm. Propeller diameter and pitch 52x32 inch, 1.32x0.81 m. Gear reduction, ratio 2.6/1. Max static thrust 220 lb, 100 kg. Power per unit area 0.23 hp/ft², 2.5 hp/m². Fuel capacity 5.3 US gal, 4.4 Imp gal, 20.0 litre.

**WEIGHTS & LOADINGS** - Empty weight 300 lb, 136 kg. Max take-off weight 529 lb, 240 kg. Payload 229 lb, 104 kg. Max wing loading 3.50 lb/ft², 17.1 kg/m². Max power loading 15.1 lb/hp, 6.9 kg/hp. Load factors +4.0, -2.0 recommended; +6.7, -3.6 ultimate.

**PERFORMANCE*** - Max level speed 69 mph, 111 kph. Never exceed speed 86 mph, 138 kph. Max cruising speed 69 mph, 111 kph. Economic cruising speed 45 mph, 72 kph. Stalling speed 28 mph, 45 kph. Max climb rate at sea level 1200 ft/min, 6.1 m/s. Min sink rate NC. Best glide ratio with power off 12/1 at 45 mph, 72 kph. Take-off distance 500 ft, 152 m to clear obstacle of 50 ft, 15 m. Take-off roll 70 ft, 21 m. Landing distance 500 ft, 152 m to clear obstacle of 50 ft, 15 m. Landing roll 165 ft, 50 m. Service ceiling 10,500 ft, 3200 m. Range at average cruising speed 186 mile, 299 km. Noise level NC.

**Under the following test conditions* - Airfield altitude 0 ft, 0 m. Ground temperature 59°F, 15°C. Ground pressure 1013 mB. Ground windspeed 0 mph, 0 kph. Test payload 229 lb, 104 kg.