G-ATSY, the Baladou used in this test, is owned by Mr. Keld Fenwick of Altair Aviation, U.K. agents for the type (Photos: "Air Pictorial")

AIR TEST No. 65

Wassmer Super IV Baladou

by the Manager

POTENTIAL LIGHT AIRCRAFT owners often complain that, considering the price of aeroplanes, the furnishings, comfort and space for passengers compare badly with any comparable motor car. In the last few years in particular, there has been great attention paid to the design and construction of really comfortable car seats; nowadays some of the seats in light aircraft would give any sales-conscious car manufacturer the horrors. But not so the Baladou, whose interior clearly owes something to motor car practice, and would not disgrace a veritable Facel Vega. Moreover the cabin, which is 43 in. wide at seat level and 46 in. at shoulder level, permits three people to sit abreast in the rear seat if required, and for two it provides space and comfort which is not normally obtainable in aircraft costing under £25,000. The price of the Baladou is less than one third of this.

The Wassmer factory at Issoire in France has made a name for itself in the design and construction of high-class sailplanes; its Super-Javelot in the Standard Class, and Bijave, a high performance two-seater, are both in quantity production and widely used in French soaring schools. Wassmer have also built a developed version of the Jodel D.112, the Jodel-Wassmer Paris-Nice. The Super IV, made in two main versions, one with retracting undercarriage, and the other fixed, is the first powered aircraft to go into production designed entirely by Wassmer. This report is concerned with the fixed-undercarriage version, named the Baladou.

Construction

Unlike most other small French-designed aircraft seen in this country, the Baladou was never intended for amateur construction. The result is an aircraft which is much more "rugged" in its main members, and more refined in other respects than might otherwise have been possible. For example, the undercarriage is a sturdy Hispano-Suiza pattern; while the finish on the wing surfaces compares well with the quality expected on a competition sailplane.

The main fuselage structure is built up from welded chrome molybdenum steel tube and is covered with fabric. This structure extends from the front firewall, to which the engine mounting and front undercarriage leg are attached, to the tail fin which is built as part of it. It includes a strong crash arch which also forms the windshield frame. The cockpit is covered by a large bubble canopy which slides rearwards to open, giving entry to front or rear seats direct from the walkway on the wing; with the canopy fully open it is possible to stand upright in the rear part of the cockpit.

The wing is of wooden construction except for the tips which are of fibreglass. The wing is covered both top and underneath with ply, and the finish is of a quality which without doubt makes a considerable contribution to the performance. Ailerons and flaps, which are also of wooden construction and ply covered, extend between them along most of the trailing edge. The flaps are of much smaller chord than the ailerons, and each is divided into two sections, mechanically linked, and operating together. There are three flaps positions: up, down 10 deg., and down 30 deg. The ailerons and flaps control circuits are entirely rods and levers; the pilot's end of the flap stem is a large lever placed between the two front seats.

The tail unit comprises an all-flying slab tailplane, and a narrow-chord rudder hinged from the tall raked fin. The rudder is fabric covered and has a trim tab on its trailing edge, adjustable on the ground. The tailplane, which is of wooden construction, is ply covered ahead of the hefty single spar and fabric covered aft of it. Anti-servo tabs are inset in the trailing edge on both halves of the tailplane, and function also as controllable fore-and-aft trim tabs. The pilot's control is a lever, alongside the flaps lever. The elevator control circuit is composed entirely of rods, while rudder and trim tabs are operated through cables; the latter is a Bowden-type cable.

The tricycle undercarriage is of Hispano-Suiza design made by Wassmer. The steerable nosewheel is coupled to the pilot's rudder controls; the mainwheels are fitted with drum brakes, operated by a handle which pulls out from the centre lower part of the control panel. The wheel brakes can be locked "on" for parking.

Powerplant

The engine is a flat-four Lycoming O-360-A2A giving a maximum of 180 h.p. at 2,700 r.p.m.; it drives a two-bladed fixed-pitch metal airscrew, and is mounted in what the manufacturers describe as "a Dynafocal Engine Suspension System". The result is to insulate the airframe fairly effectively from engine vibration, and it does provide a smooth ride at all power settings. Access to the engine is quick and easy by means of a fibreglass cowling which hinges rearward like the bonnet of a motor car. When closed the bonnet is secured by four Dzus fasteners, one at each corner. In our opinion this is a point for criticism; if a fastener at the forward end is left accidentally undone (such things can happen), or if the anchorage of the fastener itself to the fibreglass panel should fail, the bonnet might lift, and carry away. If it were hinged at its forward end, instead of aft, or positively secured at its front end by pins, as for example on the Jodel Ambassadeur, this danger would be avoided. It is not without interest that motor car manufacturers have mostly found that it is desirable to hinge the bonnets of fast cars at the front end, or else, as on the Mini, to duplicate the catch which holds down the front.

The engine is equipped with a 12-volt 35-Amp. generator, which is sufficient for a very full radio fit and electrically driven instruments.

The Baladou's fuel tanks are contained in the wing. The standard fitting is two tanks each of 24 Imp. gal., one on each side. A gauge for each tank shows contents, though not in gallons, but in marks which indicate one-quarter, one-half, three-quarters, and full. A large red arrow-shaped handle just ahead of the flap lever in the cockpit has three clearly marked positions; "Off", "Starboard Tank", and "Port Tank". An electric booster pump supplements the engine-driven fuel pump, and is normally on when in the circuit. To special order the Baladou can be fitted

with two additional 24-gal. tanks, one in each wing, which increases total fuel capacity from the normal 48 gal. to 96. Minimum octane rating required is 91/96.

Maximum permitted all-up weight of the Baladou is given as 2,650 lb.; its empty weight is 1,500 lb., leaving 1,150 lb. for disposable load. With five persons, at an average weight of 160 lb. each, amounting to 800 lb., this would leave 350 lb. for fuel; this would permit the full 48 Imp. gal. and still leave a few pounds to spare. According to the manufacturer's figures, one might cruise with this load at 6,000 ft. in still air at 2,340 r.p.m., representing 55 per cent power, with a fuel consumption of 6.38 Imp. gal. per hour; the true still air speed would then be 117 knots, and the absolute range, making no allowance of any sort, would be 880 nautical miles. Making allowances for taxi-ing, climb, and some reserve fuel on arriving at destination, a practical range for normal still air purposes would be of the order of 770 nautical miles. At the other extreme, assuming 96 gal. of fuel, the Baladou would still have load capacity for two pilots, baggage, considerable extra instrumentation, and an absolute range, making no allowances, of 1,760 nautical miles—a truly remarkable figure without external tanks or overload.

It is also worth noting that the fuel tanks are all close to the fore-and-aft centre of gravity, so that varying loads do not produce C.G. problems. The baggage compartment, which is placed aft of the cockpit enclosure, has considerable capacity, but in some circumstances the load which can be placed in it is limited more by C.G. conditions than by maximum all-up weight. Similarly, when planning flights of maximum range, using four tanks, pilots are advised to consider engine oil consumption, which at this sort of endurance could be the limiting factor rather than fuel.

Cockpit

The comfort and quality of the cockpit furnishings have already been remarked upon. In addition to the actual size of the enclosure, the bubble canopy, in conjunction with the low sides of the fuselage, gives an impression of spaciousness and a good outlook in all directions, both for pilots and passengers. The quality of the transparency is very good, and there are no distortions or reflections.

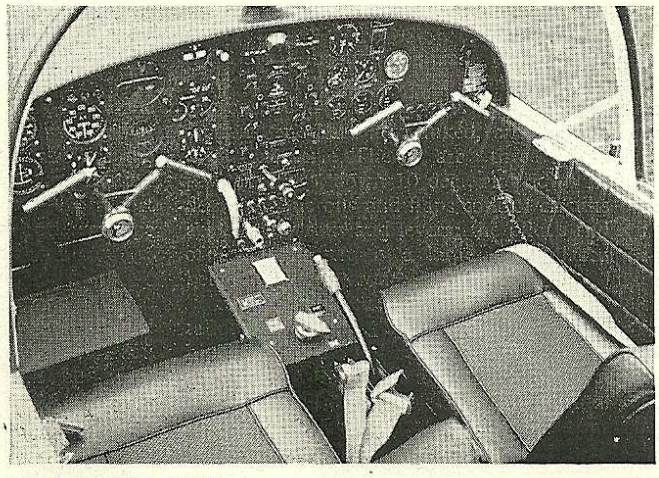
Powered by a 180-h.p. Lycoming, the Baladou has a top speed of 158 m.p.h. The sturdy undercarriage is of Hispano-Suiza design

The pilot's position is especially good; he can see the ground, over the nose, 15 yd. ahead, and all controls come comfortably to hand. The front seats are not adjustable, but the rudder pedals have an adjustment over a fore-and-aft range of 4¼ in. which is enough to provide for all but the extreme sizes of people. For outsize owners, arrangements can be made to re-position the seat. The backs of the front seats are quickly removable, providing room for a stretcher to be carried; by laying the back of the seat flat, a bed can be made which would certainly be acceptable to tired crew members.

In its basic form the Baladou is supplied with altimeter, A.S.I., compass, V.S.I., slip indicator, and normal engine instruments. The panel, which is 46 in. across, provides room for much more than this and in fact G-ATSY, the subject of this test, was equipped with a full instrument panel, night flying lights, and a very full radio fit, including A.D.F. and standard beam approach equipment. When seated comfortably this pilot's eyes were 25 in. from the nearest instrument on the panel.

Starting calls for no comment, other than the fact that no external aids are needed. Taxi-ing presents no problems, and the view is good; it was noted that the aircraft's turning circle on full lock had a radius of about three-quarters of its span. The wheel brakes when locked on were adequate for all pre-flight engine checks.

Take-off, which was from grass on each occasion in this test, is normally done using 10 deg. of flap. The Baladou comes off smoothly with a moderate rearward pressure on the stick at about 55 kt., though, as one would expect at 2,170 lb.—the weight at which we were flying, representing a power loading of about 13.6 lb./h.p. (at take-off r.p.m. of 2,500)—the acceleration is not spectacular. It is, however, adequate, and the makers claim that at full load in nil wind on hard concrete, at sea-level, and I.S.A. conditions, the take-off roll is 750 ft., and the distance to clear a 50-ft. obstacle is 1,300 ft. No figures are given for best angle of climb; but as a result of trial, it seemed to us that the simplest technique for a short ground roll might well be to use full flap (30 deg.) from the beginning. Best rate of climb is stated to be at 90 kt. using full power, which with the fixed-pitch airscrew permits 2,500 r.p.m. and can be used continuously. Raising flaps causes a slight nose-up change of trim, but no significant sink provided it is done gently; the decent-sized and conveniently placed flap lever makes this easy to achieve. There is no particular tendency to swing on take-off, but slight right rudder was needed to maintain a straight course on climb.



In addition to standard instruments G-ATSY is fitted with night flying lights and comprehensive radio aids, including A.D.F. and standard beam approach equipment

In the air

In level flight at normal cruising speeds the aircraft can be flown without regard to the rudder. It has good directional stability, and the ailerons, which are smooth and light, produce no noticeable aileron drag and allow all normal turning movements to be made on ailerons alone. Laterally the aircraft is just unstable, and if disturbed and left to itself will continue in an increasingly steep turn; because of engine torque, this is more marked to the left than to the right. The all-flying tailplane seems to have achieved just about the right combination of balance and anti-servo action; the result is good elevator control throughout the speed range; the aircraft is just stable fore and aft, though disturbances were slow to damp out. It should be noted that throughout this test, we were flying with the C.G. well forward (no load aft of the front seats).

This obviously affected the flaps-up, engine-off level stall, because the stick was right back on the stops just as the aircraft reached the stall, and there was no further movement to keep it there. There was some buffet about 2 kt. before the stall, and

with the stick back on the stops the nose bobbed up and down, and the ailerons were still effective. The rate of sink was a little over 1,000 ft./min. on the V.S.I., and the airspeed around 49 kt.; the makers' figure for stalling speed at full load is 59 kt. Using half flap (10 deg.) there was not much difference, except that the reading was about 46/47 kt. and the rate of sink higher. Using full flap (30 deg.) there was sufficient elevator movement to stall the aircraft properly, and to produce a wing drop to starboard. At all times, recovery was quick and immediate when required, and rudder control adequate to keep the aircraft level at the stall; in fact when properly stalled, it felt very much as though there was sufficient rudder control to execute a falling leaf, though naturally, the Baladou being non-aerobatic, this was not tried. Rate of sink when stalled with full flap was about 1,500 ft./min. on the V.S.I.; makers' figures for stalling speeds at full load are 55 kt. with 10 deg. of flap, and 51 kt. with 30 deg. Although the brochure does not actually say so, these figures must be indicated airspeeds and not corrected; no position error figures were quoted.

CIVIL SERVICE FLYING

THE CIVIL SERVICE Aviation Association Ltd. (CISAVIA) is mounting an appeal for new members. Formed two years ago CISAVIA provides facilities for all forms of aviation for the benefit of members of the Civil Service. Members are eligible to join one or more of the Civil Service flying or gliding clubs (or groups) which operate their own aircraft or aircraft hired from CISAVIA. Members have certain other privileges, such as cheap Personal Accident Insurance for flying and gliding activities.

So far the following clubs are actively operating in association with CISAVIA: for *Power Flying*, the Lapwing Flying Group at Denham, the Essex and Kent Group at Biggin Hill; for *Gliding*, the Royal Aircraft Establishment Gliding Club, Farnborough, Hants., the Post Office Flying Club and the London and District Civil Service Aero Club, both at Wycombe Air Park (Booker, near Marlow, Bucks.).

The clubs at Booker are also in association with the Airways Flying Club, which in certain cases can offer associate membership for power flying as well as instruction in gliding on residential gliding courses. The R.A.E. Gliding Club members can also fly at the Lasham Gliding Centre by arrangement.

Dependent on local support the formation of groups or clubs for gliding, power flying, parachuting or model flying would be encouraged in other areas in and beyond the Home Counties. The Secretary of CISAVIA is Mr. J. E. G. Harwood, Board of Trade (Civil Aviation Department), Room S.85, Shell-Mex House, Strand, London, W.C.2, who would be delighted to supply further particulars.

G-ATSY was fitted with a stall-warning indicator whose red light generally started to blink some 10 kt. above stalling speeds, and in gusts (it was a bumpy day) a good deal before that.

There is a slight nose-down change of trim during the first half of the flap movement, followed by a further nose-down change during the second half. If the fore-and-aft trim is left untouched, the aircraft will in fact put its nose down of its own accord when the flaps are lowered by just a little bit more than the correct amount to maintain its speed. Power changes produce a moderate nose-up tendency as power is increased, and *vice versa*. An overshoot using full power with flaps fully down thus produced no serious change of trim.

The pilot's fore-and-aft-trim control is powerful, and precise, and permits the aircraft to be trimmed to fly hands-off at any normal speed.

Circuits and landings

The Baladou is a clean aircraft, and takes a little time to lose speed. It doodles along very nicely at 90 kt. on very little power; 90 kt. is the maximum speed at which flaps may be lowered, and it is recommended to get down to about 80 kt. on the down-wind leg with flaps at 10 deg. At the weight at which we were flying the aircraft slipped along with only a trickle of power in this configuration, with between 1,500 and 1,600 r.p.m. on the rev. counter. Full flap (30 deg.) produced a little more drag, and with the engine speed still at 1,500/1,600 r.p.m., resulted in a glide path tapering from 80 kt. at the beginning of the cross-wind leg at 800 ft. to 70 kt. over the boundary, which was just about right, into a wind of 15/20 kt. with gusts.

The final landing run was short enough, and can be aided by the use of brakes; the makers quote a full-load still-air landing roll of 550 ft. on a hard surface, and a total distance of 1,300 ft. for coming to a full stop after passing over a 50-ft. obstacle. It is quite clear that some skill is required to achieve this sort of performance, and that to do it, speed over the boundary would have to be lower than was used in the gusty conditions prevailing during this air test. The glide path, even using full flap, would be fairly flat.

This problem is probably eliminated in the variant with the retractable undercarriage, since when it is lowered it must produce much more drag than the carefully streamlined fixed undercarriage of the Baladou. With the Baladou the margin between a nicely judged approach and a long float across the aerodrome is a little closer than desirable for the less skilled pilot, and handling would be improved by greater available drag, and in consequence a steeper approach, and wider margins of usable speeds and power.

The landing itself presents no problems. Elevator control is very effective, although it was noticed that with the C.G. well forward a fairly large movement was required during the final stage of the landing in order to get the tail well down. The Baladou benefits from the aerodynamic breaking provided by a tail-down landing, and in addition it prevents too much thumping on the nosewheel on rough ground. The actual touch-down is soft and easy to judge. There is no tendency to swing, and wheel brakes may be used to shorten the landing roll as soon as desired. Against the prevailing wind the landing roll seemed to be consistently within the figures specified by the makers, although no doubt the grassy surface helped as well as the wind.

Costs

The basic Baladou—that is without radio, and with basic instruments, but otherwise as described in this report—cost at the time of this test £6,872 registered in the U.K., all duties and import surcharge paid and ready to fly away. Fitted with a full instrument flying panel, and with a 360-channel Communications radio, the cost would be in the region of £7,400 plus or minus £100 according to the make and quality of radio selected. A summary of operating costs prepared by the U.K. agents is appended (see opposite page).

Summary

The Baladou is a remarkable aeroplane. When its performance and comfort are considered in relation to its cost, there is no doubt that it is excellent value for money. One of the criticisms made, relating to the engine cowling, should be easy to obviate at quite small expense; it could even be done privately by any reasonably skilled and equipped private owner. To increase the drag on the approach would be a much greater problem; but in considering this point it would be unfair not to balance it against all the other excellent features of the Baladou, which are many. What it amounts to is that the pilot of the Baladou has got to know his aeroplane, and take pride in flying it well; it is a very delightful and rewarding aeroplane to fly, and if flown as well as its good qualities deserve, need cause no difficulties to any pilot worthy of it.

Air Pictorial would like to thank the owner and agent, Mr. Keld Fenwick of Altair Aviation Ltd., Ketton House, Kedlington, Haverhill, Suffolk, very much for permitting us to do this air test on G-ATSY, and for an introduction to a delightful and unusual aeroplane.

Maker's specification

Specification: Empty weight (approx.) 1,500 lb.; max. authorised weight 2,650 lb.; useful load 1,150 lb. Usable fuel 48 Imp. gal. Wing span 32 ft. 9¾ in.; length 26 ft. 7 in.; wing area 172.5 sq. ft.

Performance (at max. authorised wt.): Max. speed 158 m.p.h.; cruise, 75 per cent power at 6,000 ft., 152 m.p.h.; cruise, sea-level, 146 m.p.h.; take-off run, 650 ft.; to clear 50 ft., 1,300 ft.; landing roll 550 ft.; distance to stop after clearing 50 ft., 1,300 ft.; rate of climb 885 ft./min.

WASSMER SUPER IV BALADOU: TYPICAL U.K. COSTS

Fixed annual costs

Depreciation over 5 years with 30 per cent residual (Baladou, £7,424)	£1,039
Insurance	120
Hangarage	120
C. of A.	50
Miscellaneous	30
	£1,359

Hourly costs

Fuel: 8 gal./hr. at 5*s.* 7*d.* per gal.	£2 4*s.* 8*d.*
Oil: 1 pt./hr. at 10*s.* 6*d.* per gal.	1*s.* 6*d.*
Maintenance: airframe and engine (Gen. purpose cat.)	7*s.* 6*d.*
Spares, mods, and rectifications	4*s.* 0*d.*
Maintenance: instruments and radios	1*s.* 6*d.*
Engine overhaul: £600/1,200	10*s.* 0*d.*
Landing charges (average flight 2 hrs., 10*s.* per landing)	5*s.* 0*d.*
	£3 14*s.* 2*d.*

Hours flown	*200*	*400*
Fixed costs	£1,359	£1,359
Hourly	£741	£1,482
Total annual costs	£2,100	£2,841
Costs per hour	£10 10*s.* 0*d.*	£7 2*s.* 0*d.*
Costs per aircraft mile: Baladou 152 m.p.h.	16.6*d.*	11.2*d.*
Costs per seat-mile: with 5 seats	3.3*d.*	2.2*d.*
with 4 seats	4.1*d.*	2.8*d.*