

The Little Aeroplane Company Ltd

Home of the Sherwood Ranger

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Ranger Newsletter No 12 Dec '03

SPIN-TEST

Dear Ranger Enthusiast,

I am sending you this Newsletter, to inform you about the recently effectuated Spin test of the Sherwood Ranger ST.

To have the full certification for 450 kg, according to the recently added requirements from BCAR Section S, we have the pleasure to present to you the "Test flight report" written by the test pilot Eddie Clapham.

He kindly accepted to carry out the flight tests in the Sherwood Ranger ST G-WZOL, (certified as 390 kg single seater, but with full ST enforced airframe structure) owned by George Webb. George trailed his plane all the way to our TLAC facilities at lower Upham, to give us the opportunity to be present at this very important event.

As you can read from Eddie's report, the plane behaved very nicely, and according to him, fully met the requirements. Now it is in the hands of PFA engineering to make the final recommendation for the full approval. Let us hope, that the paperwork will go through quite soon!

So, here follows the original "Flight test report in total" (Nothing added, neither removed)

SHERWOOD RANGER G-WZOL
Spin Evaluation to the Requirements of BCAR Section S issue 2.

Introduction

The Sherwood Ranger is a UK microlight aircraft of classic bi-plane configuration with 4 ailerons and no flaps. It was designed by Russ Light (deceased) and initially approved by the PFA to BCAR Section S issue 1. In this guise it has been built in small numbers (approx. 8) from kits supplied by Russ. Unfortunately Russ's developing illness made it increasingly difficult for him to manufacture kit components and to pursue his aim of upgrading the aircraft to take advantage of the increased take off weight allowed by issue 2 of BCAR Section S.

However, those pilots lucky enough to have flown the Sherwood Ranger have all been fulsome in their praise of its good looks and its sweet and pleasant handling characteristics, both in the air and on the ground. Consequently, following Russ's untimely death, there were others keen to ensure the aircraft's continued existence and in particular to complete the upgrading already started. The Sherwood Ranger is now "owned" by The Little Aeroplane Company which was set up by Dudley Pattison and is now in the hands of Borgar Jansson.

BCAR Section S issue 2, in addition to allowing a weight increase from 390kg to 450kg, has introduced a requirement to demonstrate satisfactory recovery characteristics in the event of an

unintentional spin occurring, (ref part S221). This report gives details of the testing carried out on Sherwood Ranger G-WZOL to demonstrate compliance in this respect.

The Test Aircraft

G-WZOL incorporates the modifications necessary to permit operation at a max. take off weight of 450kg and has been used to assess flight characteristics and performance at this weight. It was built by George Webb under the PFA system, has completed a total of approx. 50hrs flight and has the feel of a well sorted aircraft. It is fitted with an early version of the Jabiru 2200 engine which is generally believed to produce less than the claimed 80hp at 3300rpm. This, together with the fact that the indicated max static rpm was 2500 and the stabilised full throttle climb rpm at 50 mph IAS was 2400 could account for the rather disappointing solo ROC, (timed between 2500-3500ft at 400 ft/min). It might be worth checking tacho accuracy and prop suitability. All temperatures stayed well within limits during the 12min full throttle climb to 5000ft. The aircraft is fitted with a small electrically operated trim tab which is very effective and requires little adjustment throughout the solo envelope. Lateral trim was good.

Test Conditions

Date of Test:- 28/11/03 Flight times:- 1200 to 1300hrs

Test location:- Lower Upham Farm strip near Swindon

Crew:- E.Clapham

Weather:- CAVOK,
wind; light southerly,
QNH; 1009mb, temp; 9degC.

Weight and Balance:-

Item	Wt (lb)	arm (ins aod)	moment (lb in)
Empty aircraft	546lb	-1.71	-937
Crew (inc. parachute, etc)	196	31.85	6242.6
Fuel (26L)	42	2.5	105
Totals	784	6.9	5410.6
Limits	860	3.8-7.7	

Thus the CG position tested is fairly close to the aft limit and therefore the tests could reasonably be expected to reveal any adverse characteristics should they exist.

Preliminary Stall Checks

At 5000ft the minimum IAS at idle was 40mph stick hard back. A stall break could not be achieved. With a moderate amount of power a break was obtained at 37mph IAS. This was accompanied by a gentle nose drop and no wing drop. Recovery was immediate on relaxing stick back pressure.

Spins Carried Out (all initiated at 5000ft QFE)

#	Turns	Initiation	Recovery		Height loss (ft)
			Technique	Turns	
1	½L	standard	normal	<1/2	<200
2	½R	standard	normal	<1/2	<200
3	1L	standard	normal	approx. ½	<200

4	1R	standard	normal	approx. ½	<200
5	2L	standard	normal	<1	<500
6	2R	standard	normal	<1	<500
7	2L	standard with cruise power	normal	<1	<500
8	2R	standard with cruise power	normal	<1	<500
9	3L	standard	normal	<1	<800
10	3R	standard	normal	<1	<800

Spin Characteristics

Full back stick and full rudder deflection were used in the initiation of all spins but there was some variation in initial behaviour. If the spin was initiated from an idle stall without an excessive nose up attitude, the development stage could take up to a full turn with the nose progressively dropping and the roll rate progressively increasing. If the spin was entered from a more nose up attitude or with some power on the development stage could be about ½ a turn. Once established, all the spins achieved were similar in character. The established roll rate was surprisingly fast for a fairly large low wing loading aircraft, (i.e., approx. 180deg/sec), and the attitude appeared to be close to the vertical. "G" forces seemed quite low and in one spin to the right air speed was still increasing when the IAS was 60mph suggesting perhaps that this was a spiral dive. At all times the aircraft had to be held in the spin with a rearward stick force and an in-spin pedal force. Recovery could be initiated by relaxation of the control forces, very little forward stick movement being necessary. Too much enthusiasm in the application of forward stick could lead to the nose going well past the vertical! At no time during any of the tests was there the slightest tendency for the spin to flatten. The engine continued to run reliably throughout the tests.

Conclusions

1. Spin testing has been carried out on Sherwood Ranger G-WZOL in order to show compliance with BCAR Section S issue 2.
2. During a series of 10 spins, involving up to 3 turns in each direction, the aircraft responded promptly to normal recovery action and no adverse characteristics were experienced.
3. In all spins, recovery was achieved in less than 1 further turn.
4. The spin tests carried out on G-WZOL are not claimed to be a rigorous assessment of the types spin characteristics as would be necessary, for instance, for a clearance for intentional spinning or aerobatics. However the tests that were carried out showed benign and consistent characteristics and consequently a more detailed investigation was considered unnecessary.
5. It is therefore concluded that the Sherwood Ranger satisfies the requirements of BCAR Section S issue 2 part S221 on the basis of the tests here reported.

E. CLAPHAM

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Just open:

<http://tlac.talla3.com>

Best Regards to all of you, and hope to serve you better with this new site.

Borgar, TLAC