B.G.A. TECHNICAL COMMITTEE

TNS 1/2/90

HAPPY NEW YEAR! Herewith the Yellow Pages for 1990, revised and re-written in more user friendly format. Please report omissions to the B.G.A. office. Please refer to these pages before completing C. of A. renewal submissions.

PART 1 AIRWORTHINESS "AGGRO".

1.1. Ka6CR (and similar) cracking of lower rudder hinge-discovered after removal of paint. (Reported by Ian Smith, E. Sussex).

1.2. Grob G.109. Extension of structural life beyond 3000 hours - inspection schedule available from U.K. agents.

1.3. Grob G.109 C.A.A. require N.D.T. of Spar Spigots every 300 hours. (C.A.A. AD 012-11-86 & TM 817-20 refer).

1.4. Jantars The following Service Bulletins are available from U.K. agents:-
BE 031/87 Jantar 2. Extension of life from 1500-3000 hours
BE 035/88 Jantar Std. 3. S/No's 1266-1268. Extension to 6000 hours
BE 036/89 Jantar 1. Extension to 4500 hours after wing pin replacement
BE 037/89 Jantar Std. Extension to 6000 hours after pin replacement

1.5. LS4/LS4A Technical Bulletin 4030 introduces Tost G.88 hook (c.g. position) and Tost E.85 (nose).

1.6. Calif Inflight break up. A.A.I.B. Report makes exciting reading. New acquisitions should not be fitted with the "all flying" tailplane

1.7. ASW 24 German Certification is now validated by B.G.A., subject to minor modifications as outlined in attached letter from Schleicher, and access to a U.K. Flight Manual (in English!).

1.8. IS 28 M2A G-BHRS Fatal Accident Report from A.A.I.B. highlights the importance of a pre-take-off check of propeller pitch and static RPM.

1.9. Bellanca Citabria - Main landing gear damaged. A.A.I.B. report emphasises the importance of correct maintenance & lubrication of wheel bearing assemblies.

1.10. Ka7/K13 Fin support structure (front). Water ingress may have damaged the support structure. Apply loads to the fin to see if anything moves! (Report from RAF Germany).

1.11. SF 25 / SF 28 Series S.L.M.G.s. T/Note 553-41 requires overhaul (every 8 years) of the Fuel shut off valve (LBA/AD/82-50/2 refers).

1.12. Propellers fitted to certificated S.L.M.G.s must be of a type approved in the Type Certificate data sheet, flight manual, or

airworthiness approval note. The majority of these so approved are by Hoffman. C. of A. renewal submissions will be rejected if the incorrect type is quoted on C.A.A. form 202L. Significant performance improvements have been identified by changing to the type tested prop!

1.13. Vega (T.65C) - "Sport" Mass balancing of ailerons in accordance with TI 92 & 95 is recommended to minimise the possibility of aileron flutter. (T. Macfadyen - Cotswold).

1.14. T.59 Kestrel Rudder drive Annual N.D.T. inspection has uncovered cracks that were not present a year ago! (Tim Macfadyen - Cotswold).

1.15. ASW 24 Undercarriage Support modification has been devised by Martyn Wells, and is strongly recommended as a means of preventing premature failures! (060 885 79)0) / or Peter Wells 0494 883101)

1.16. ASK 21 G.103 ACCRO Tost hook attachment bolts found to be sheared. Evidence of severe fretting at the base of the threads, strongly suggests that bolts had lost their torque? (R.A.F.G.S.A. Bicester).

1.17. ASW 24 Fuselage drainage In the event of a ballast system malfunction (leak) water is likely to be trapped in the fuselage in sufficient quantity to invalidate both your weight & your balance! Drain holes should be incorporated. (Martyn Wells).

PART 2 - GENERAL MATTERS

2.1. Revision of Air Accident Regulations A.A.I.B. Bulletin 12/89 - outlines the new procedures.

2.2. B.G.A. Weight & Balance Proformas have now been revised by Frank Irving and are available in both Imperial and Metric units - from the B.G.A. office (samples herewith).

2.3. Self-launching motor gliders - C. of A. Renewal Please refer to the supplement to this TNS for correct procedures for C. of A. renewal by C.A.A. and for the latest (April 1990) scale of C.A.A. charges. The date of signing for the "Star Inspection" must not generate greater than 14 days from the date of the completion of the form 202L by the C.T.O. at the B.G.A. office at Leicester! The C. of A. renewal air test may be completed 56 days before the date of the "Star" inspection.

2.4. B.G.A. Inspection Courses are now being offered on a trial basis by Mid Warwick College of Further Education (M.W.C.F.E.), Warwick New Road, Leamington Spa, CV32 5JE (0926 881108 - contact Richard Adams B.G.A. Inspector) - vacancies will be limited so please make your bookings directly to Richard Adams.

1. Course October 6-7th 1990 will cover wood & fabric repair and restoration, and general inspection techniques.

Cost £50 per day. £90 per weekend, plus local accommodation - college can advise.

2. Course 3rd November 1990 - motor gliders One day £50 plus local accommodation.

These courses can be developed to suit the requiremnts of both the B.G.A. and the applicants. Please make them worthwhile by attending them.

2.5. B.G.A. Charges for 1990 Current schedule herewith.

R.B. STRATTON
CHIEF TECHNICAL OFFICER
1st FEBRUARY, 1990.

LATE NIGHT EXTRAS!

1.18 Schleicher Tech-Note (herewith). Repeats B.G.A. TNS 12/89, Inspection of Elevator loose glued bonded joint.

The range of Schleicher gliders involved has been extended by this Tech-Note.

2.6. Tugs operated under B.G.A. (M3) Maintenance Approval

The renewal application on CA Form AD200 accompanied by fees payable to the B.G.A. as listed in C.A.A. Airworthiness Notice No.25 should be made to the B.G.A. office 62 days before expiry of the C. of A. The C. of A. renewal flight test may be made 62 days preceeding the expiry date. You should all consult CAP 520.

TNS 11/90.

SHEET: 1 of 3	Technical Note for	Alexander Schleicher GmbH & Co. Segelflugzeugbau D-6416 Poppenhausen

Glider model:

Ka 2 u. Ka 2B	TN-No. 11
Ka 6, 6/0, 6B, 6BR, 6CR, 6B-S	TN-No. 21
K7	TN-No. 18
K8, K 8B, K 8C	TN-No. 23
K9	TN-No. 1
K11	TN-No. 1
ASK 13	TN-No. 12
ASK 18, ASK 18B	TN-No. 6

Serial number applicability:

Ka 2,	Data-Sheet No. 140,	all serial no.s
Ka 2B,	Data-Sheet No. 203,	all serial no.s
Ka 6,	Data-Sheet No. 205,	all serial no.s
Ka 6/0,	Data-Sheet No. 205,	all serial no.s
Ka 6E,	Data-Sheet No. 205,	all serial no.s
Ka 6BR,	Data-Sheet No. 205,	all serial no.s
Ka 6CR,	Data-Sheet No. 205,	all serial no.s
Ka 6BS,	Data-Sheet No. 205a,	serial no. E1
K7,	Data-Sheet No. 211,	all serial no.s
K8,	Data-Sheet No. 216,	all serial no.s
K8B,	Data-Sheet No. 216,	all serial no.s
K8C,	Data-Sheet No. 216,	all serial no.s
K9,	Data-Sheet No. 221,	serial no. 1
K11,	Data-Sheet No. 668,	serial no. V1
ASK 13,	Data-Sheet No. 267,	all serial no.s
ASK 18,	Data-Sheet No. 307,	all serial no.s
ASK 18B,	Data-Sheet No. 307,	all serial no.s

Subject:

Elevator.

Compliance:

Prior to the next take-off.

Reason:

A glider of the model K7 failed to gain normal flight attitude immediately after tow rope release on winch launch. With the stick full back only the left elevator could be actuated in the correct direction; the right elevator deflected downwards. The reason for this was a loose glue bond at the elevator rib 1 at which the elevator fitting is attached. Similar incidents lead already before to the issue of the LTA 72-7 dated Feb.9,1972.

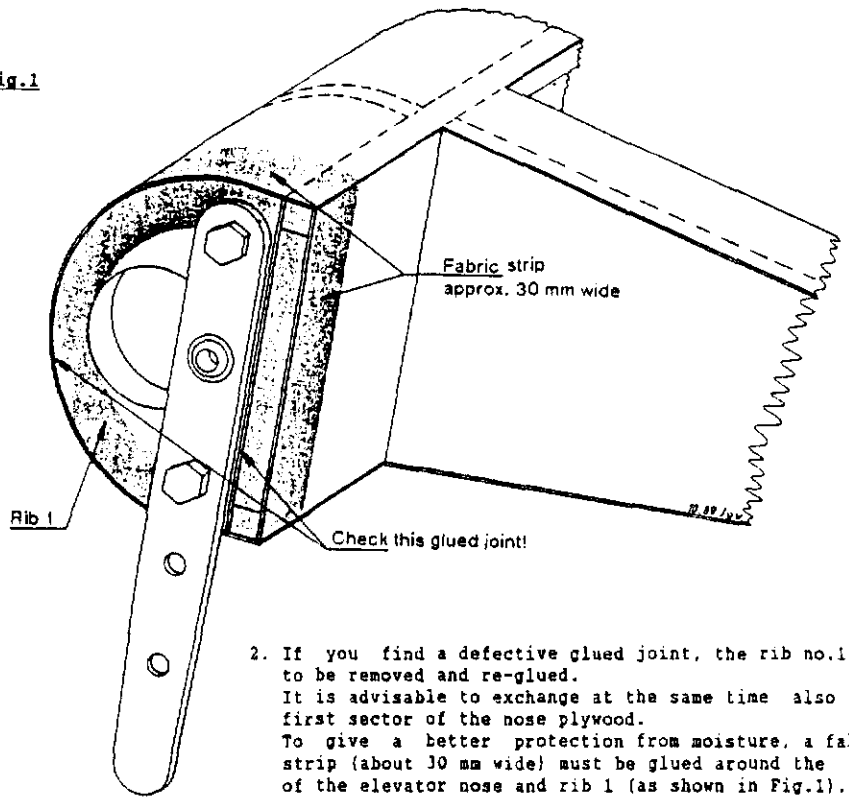
Action:

1. Remove elevator.
   Check that the glued joint between rib 1 and the leading edge plywood and the elevator spar respectively is in good condition (see Fig.1). Before doing so check whether the LTA 72-7 of Feb.9, 1972 was already previously accomplished (this is not applicable to K9, K11 and ASK 18); if yes then the fabric strip first carefully has to be detached in order to be able to check the glued joint.

Technical Note
for
Glider Models as per Sheet 1

Alexander Schleicher
GmbH & Co.
Segelflugzeugbau
D-6416 Poppenhausen

Fig.1



2. If you find a defective glued joint, the rib no.1 has to be removed and re-glued.
It is advisable to exchange at the same time also the first sector of the nose plywood.
To give a better protection from moisture, a fabric strip (about 30 mm wide) must be glued around the edge of the elevator nose and rib 1 (as shown in Fig.1).

3. The above action under points 1. and 2. must be repeated every three years during the annual re-inspection. This copy of the Technical Note must be inserted in the Flight and Operations Manual of the respective glider as an annex and a corresponding entry must be made into the "Amendments to the Manual".

Material & drawings:

Rib 1 made from multi-plywood, 15 m thick, and nose plywood, 1 mm thick, according to DIN L 182/183, class 1/2 or NL 9128, 6.1013. Drawing as above.

Mass and C.G.:

It is not necessary to redetermine the mass and C.G. data.

BGA TN 3/12/89 Re/23.

1136

	Technical Note No. 653 - 41 Edition 2	SF 25 Page: 1 No. of Pages: 1

Subject:	Fuelshut-off valve
Effectivity:	Motorglider SF 25 B "Falke", all serial numbers Motorglider SF 25 C "Falke", all serial numbers Motorglider SF 25 D "Falke", all serial numbers Motorglider SF 25 E Super-Falke, all serial numbers Motorglider SF 25 K "Falke", all serial numbers
Accomplishment:	every 8 years
Procedure:	Due to wear of the valve gasket by frequent operation, the fuel shut off valve was to be replaced every 5 years. According to newer knowledge the replacement is extended to 8 years.
Actions:	1. Drain the fuel (on all serial numbers possible by removing the filter glass, on later serial numbers also possible through the tank drain under the fuselage). 2. Remove the old fuelshut-off valve by loosening the nuts. 3. Install the new fuelshut-off valve. Pay attention to the flow direction (arrow on the bottom of the fuelshut-off valve). 4. Refill the tank and check the fuelshut-off valve on tightness and function.
Material:	1 fuelshut-off valve (Valve V 8M specialtype with "Viton-gasket" from Fa. Philipp Kreis TRUMA)
Weight and balance:	no influence
Remarks:	1. Use only the fuelshut-off valve, specialtype with "Viton-gasket". The fuelshut-off valve can be obtained by Fa. Scheibe Flugzeugbau. 2. Action 1-4 can be performed by a skilled person. Accompleshment of the actions are to be entered in the aircraft logbook by licensed inspector. 3. This technical note replaces the technical note with same number from 3. 2. 1982.

SF 25/ SF 28 Fuel Cocks

SCHEIBE FLUGZEUGBAU GMBH
Dachau, Aug. Pfaltz-Str. 23

19. 1. 1989

Mühlbeck

Erich Feucht, München 08.82

	Technical Note No. 770-13 Edition 2	SF 28 A "Tandem-Falke" Page: 1 No. of Pages: 1

Subject:	Fuelshut-off valve
Effectivity:	Motorglider SF 28 A "Tandem-Falke", all serial numbers
Accomplishment:	every 8 years;
Procedure:	Due to wear of the valve gasket by frequent operation, the fuel shut off valve was to be replaced every 5 years. According to newer knowledge the replacement is extended to 8 years.
Actions:	1. Drain the fuel (on all serial numbers possible through the tank drain under the fuselage). 2. Remove the old fuelshut-off valve by loosening the nuts 3. Install the new fuelshut-off valve. Pay attention to the flow direction (arrow on the bottom of the fuel shut-off valve). 4. Refill the tank and check the fuelshut-off valve on tightness and function.
Material:	1 fuelshut-off valve (Valve V 8M specialtype with "Viton-gasket" from Fa. Philipp Kreis TRUMA)
Weight and balance:	no influence
Remarks:	1. Use only the fuelshut-off valve, specialtype with "Viton-gasket". The fuelshut-off valve can be obtained by Fa. Scheibe Flugzeugbau. 2. Action 1 - 4 can be performed by a skilled person. Accomplishment of the actions are to be entered in the aircraft logbook by a licensed inspector. 3. This Technical Note replaces the Technical Note with same number from 3. 2. 1982.

SCHEIBE FLUGZEUGBAU GMBH
Dachau, Aug.Pfaltz-Str.23
19. 1. 1989

Erich Feucht, München 08 63

INS 1/2/90 To owners 2/4/90

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AIRMAIL
British Gliding Association
Chief Tech.Officer Dick Stratton
Kimberley House, Vaughan Way,

LEICESTER
ENGLAND

ASW 24

Ihr Zeichen | Unser Zeichen gw/ba | 12.12.1989

Dear Dick,

The incident with ASW 24, s/n 24019, caused to look at our records about changes in the ASW 24 design which became effective before the German Type Certificate for the ASW 24 was issued.

A list of major or minor changes on the ASW 24 has been prepared, one of them is the airbrake guide / stop which has been reported to you and hopefully already been rectified. (See point 3.).

There are four other points from the 24 changes which are important to airworthiness.

1. The airbrakes must open 150 mm above the wing upper surface when wheel brake lever is full back. If not, adjust. If not possible, please ask for advice. This point has a low priority, but the airbrakes should be as effective as with current production ASW 24s; as of s/n 24025 this is series production standard.

2. The rudder, elevator and ailerons need mass balance according to the values given in the Maintenance Manual. According to our records this has been done in all gliders since s/n 24003. Prototypes 24001 and 24002 have been retrofitted.

3. The polyamid stop / guide of the airbrake control has to be fixed by two screws, see our letter Oct.25, 1989 to RAF/GSA. Since s/n 24025 this problem has been solved by fixing the polyamid with a fabric layer.

4. The instrument tubes (pipe) from PVC must be fixed on the side of the fuselage below the lap belt anchoring point in order to avoid that these tubes are fouled between seatpan and fuselage. Mysterious instrument misreadings were caused by this failure in hot climate operation (Mike Opitz in Minden). This problem has been rectified in series production since s/n 24050 (see sketch).

-2-

5. The fin gets an inspection hole so that it can easily be checked if a trim weight / battery is installed in the fin or not (see sketch). This hole is drilled in all series production gliders as of s/n 24036 according to our records.-

6. Please check the airbrake paddles; the contour has been changed two times in series production in order to avoid fouling with other parts, bolts etc. There were no problems in service and these are only preventive measures, but according to Murphy's law .....
The upper paddles have been changed as of s/n 24025, the lower paddles got shorter and this was introduced in spring this year, approx. as of s/n 24040.

For your assistance we produce the following table of ASW 24 owners, who have to be informed:

	Points to be regarded	1	2	3	4	5	6
24011	Warren M Kay		+				
24012	Trevor Stuart		+				
24014	Tom S. Zealley		+				
24015	George Metcalfe		+				
24019	RAF/GSA		+				
24023	Dave Watt		+				
24024	Alistair Kay		+				

+ = already done by Schleicher

Thank you for your kind cooperation.

Yours sincerely,

ALEXANDER SCHLEICHER
GmbH & Co

Gerhard Waibel

Gerhard Waibel.

Encl.s

cc: JJ ASSOCIATES

CAA AD No	Associated Material	Description	Applicability - Compliance - Requirement
		PART 2 - ADDITIONAL ITEMS CLASSIFIED AS MANDATORY BY THE CAA	
012-11-86	TM 817-20	Flight Controls - Improvement of flutter behaviour - Variation of the requirements of LBA AD 85-218/2.	Applicable to G109B motor glider Serial Nos 6200 to 6434 inclusive except as indicated in Grob Technical Information TM 817-20. Notwithstanding the compliance requirements contained in Technical Information TM 817-20 MODIFY the aircraft in accordance with the TI not later than 31 December 1987. Until the modification is embodied the permitted Never Exceed Speed (Vne) is reduced to 100 kts/190 km/h. A placard to this effect must be displayed adjacent to the air speed indicator.
006-10-88		Spar stub end fittings - Cracks at or near the toe of the weld on the top and bottom surface of the spigot.	Applicable to all G109 and G109B Serie motor gliders. Compliance is required not later than 50 flying hours from the receipt of this Directive. (i) Remove the wings in accordance with the Flight Manual instructions. (ii) Remove the glass reinforced plastic (grp) or the protective lacquer covering the spar stub extremity, avoiding any damage to the metal parts, sufficient to expose the top and bottom weld ends and the weld transition into the spigot body - see figure A.

(AD continued overleaf

CAA AD No	Associated Material	Description	Applicability - Compliance - Requirement
006-10-88 (continued)			(iii) Inspect the end of the weld and the spigot itself at the toe of the weld for cracks, using a x10 magnifying glass (four places) - see Figure A. There are two spigots per aircraft and cracks can occur on the top and on the bottom of the spigot. (iv) If a crack is suspected, and appears to be confined to the weld itself, ie does not extend circumferentially into the spigot, or where there is a lack of weld penetration, the wings may be replaced. The aircraft may be flown to a place where the existence of cracks can be confirmed or otherwise by NDT means, by an Organisation approved for that purpose by the CAA. The flight must be conducted with the pilot only on board. Abrupt manoeuvres and/or high speeds are prohibited. If a crack is confirmed either in the weld only or in the spigot itself, rectification must be carried out to the manufacturer's approved repair scheme before further flight. Report the results of the inspections to the manufacturer and to the SDAU of the CAA.

CAA AD No	Associated Material	Description	Applicability - Compliance - Requirement
006-10-88 (continued)			(v) Where the spitots are found to be not cracked either after the actions of (iii) or (iv) above, reprotect the area where the grp has been removed, either with a lacquer or a brushed coat of epoxy resin. Replace the wings to the instructions in the Flight Manual. Repeat the instructions commencing at (i) above except that only the reprotection has now to be removed, at intervals not exceeding 300 hours.

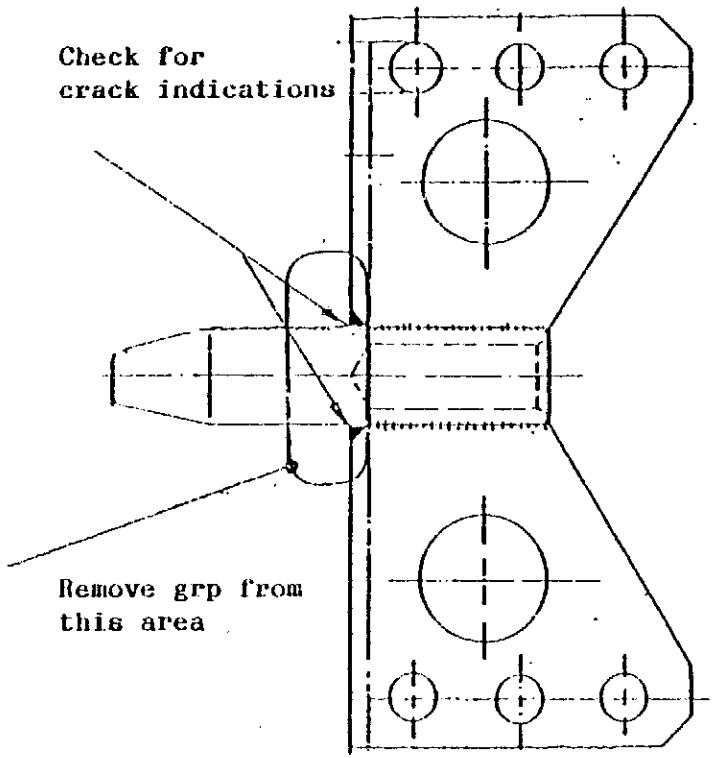
(AD continued overleaf)

CAA AD No

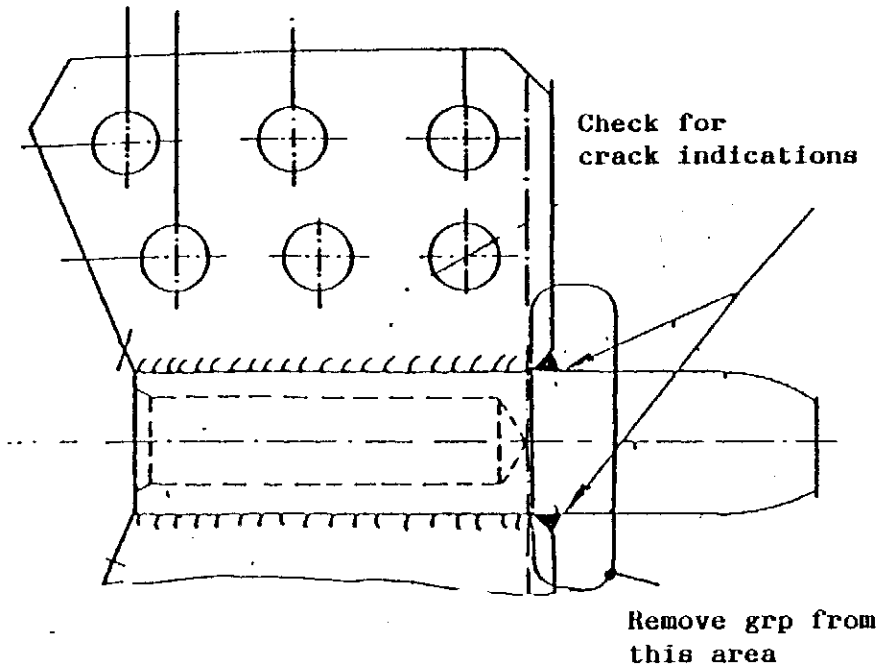
006-10-88 (continued)

FIGURE A

(Not to Scale)



G109 SPIGOT FITTING



G109B SPIGOT FITTING

No: 12/89 Ref: EW/C1128 Category: 1c

Aircraft Type and Registration:	Brasov IS-28M2A G-BHRS motor glider	
No & Type of Engines:	1 Limbach SL 1700 EA piston engine	
Year of Manufacture:	1979	
Date and Time (UTC):	29 July 1989 at 1754 hrs	
Location:	Near Woodford Aerodrome, Cheshire	
Type of Flight:	Pleasure	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (fatal)	Passengers - 1 (fatal)
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence Group A and Glider Instructor's Rating	
Commander's Age:	53 years	
Commander's Total Flying Experience:	61 hours on powered aircraft (of which 9 were on type) and 362 glider hours	
Information Source:	AAIB Field Investigation	

History of the flight

At the start of the day's flying the aircraft was inspected and refuelled to a fuel quantity sufficient for 4 hours flying. It was used for two short flights and refuelled again before being flown by an instructor on a further short detail during which a touch and go landing was carried out. This instructor found the aircraft to be serviceable and its climb performance normal. The runway in use was 25, the weather was good, and the surface wind was estimated to be westerly at about 8 knots.

At about 1740 hrs the instructor who had flown the second detail of the day climbed into the aircraft with a passenger for another short detail of circuits and landings. When the aircraft took off, its ground roll was longer than usual, it appeared to climb in an abnormally nose-high attitude and its rate of climb was low. Soon after lift-off it turned approximately 30° to the left. It was normal practice for the landing gear to be left down to a height of about 400 feet in case of engine failure and a need to reland. On this occasion, the landing gear was retracted at a much lower height and the aircraft was seen to descend slightly before it passed over the airfield boundary and resumed a slow climb. When it was about 200 metres beyond the airfield boundary at a height estimated by witnesses variably as

between 150 and 500 feet it began a further turn to the left, whereupon the bank angle increased sharply and it spun to the ground. One witness, who was inside a hanger, heard the engine operating at what he thought was low power as the aircraft approached. He then heard a surge of power a second before the sound of the impact. Another witness, who was close to the flight path, thought the engine noise ceased before the impact.

Both occupants received fatal injuries. The pilot was found to have his left shoulder harness disconnected and loosely draped over his left shoulder; the harness buckle was found on the cockpit floor unattached to any of the straps. The passenger was held in his seat by his right shoulder harness, which was the only strap that had to be cut before his body could be removed. It was not possible to determine from the evidence whether or not both safety harnesses had been fastened at impact but the nature of the injuries to both occupants were such that the accident would not have been survivable with or without safety harnesses.

Aircraft information

The aircraft propeller had three pitch settings, fine, coarse and feather. Propeller pitch was controlled from a lever in the cockpit which normally rested vertically down. The lever was used to set or release the coarse pitch spring locks. Pitch change was achieved by lifting this lever to an intermediate position and then lowering it again to the vertical. The propeller could be feathered by moving the lever fully up. The propeller should normally have been selected to fine pitch for take-off and the pitch should have been checked by the rpm achieved at the start of the take-off roll. The check list for both 'Power Check' and 'Take-Off' stated 'THROTTLE - FULL, CHECK 2600 TO 2800 RPM'. For the propeller to be changed from coarse to fine pitch with the engine stopped, the lever had to be raised to the half-up position and lowered; with the engine running, power had to be reduced to 1400 rpm, the lever raised to one-third up and then slowly lowered, when a rise in rpm would be noted. The normal climb speed of the aircraft was 50 kt and the stalling speed at the accident weight was 38 kt. It was known to have a tendency to drop a wing in the stall and its spin was described by the CFI of the club as rapid and violent.

Pilot information

Of the 9 hours experience the pilot had on type, 8 had been flown more than two years earlier. He had flown a dual check and one solo flight in the aircraft in the previous December and January but had not flown again until the day of the accident, when he flew one detail before the accident flight. There was no evidence of any medical condition on the part of the pilot or the passenger that could have contributed to the accident.

Wreckage Examination

The aircraft lay on a golf course just outside the south-western boundary of the airfield. It had clearly impacted the ground in a very steep attitude, in the order of 80° nose-down. The impact had pushed

the engine back into the cockpit area and caused the fin/tailplane assembly to "whiplash" forwards. It was also evident from the relationship between the wreckage and the initial impact marks that the aircraft had been spinning to the left. There had been no pre- or-post-crash fire.

The position of the pilot's throttle lever suggested that it had been closed prior to impact with the ground and the condition of the propeller showed that very low, or no, power had been present at impact. On-site it was determined that no malfunction was apparent in the aircraft's flying controls and there was no evidence of pre-crash structural failure.

The engine and fuselage of the aircraft were taken to AAIB Farnborough for more detailed examination. The propeller hub pitch mechanism appeared to have been in working order prior to the accident and, although the propeller pitch setting could not be determined with certainty, there was no evidence to indicate that the propeller might have been in coarse pitch at impact.

The engine was examined and no defects were found with the basic mechanics of the unit. The ignition magneto was bench-tested and functioned correctly. The simple carburettor was strip examined and no defects were found.

No mechanical, structural or electrical defects were found which could have contributed to the accident.

No: 12/89 Ref: EW/C1131/25 Category: 5

Aircraft Type and Registration:	Caproni Vizzola Calif BGA 1957	
No & Type of Engines:	None	
Year of Manufacture:	1974	
Date and Time (UTC):	5 August 1989 at 1436 hrs	
Location:	Bidford-on-Avon, Gloucestershire	
Type of Flight:	Private - pleasure	
Persons on Board:	Crew -2	Passengers -None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence with BGA Assistant Instructor's Rating	
Commander's Age:	33 years	
Commander's Total Flying Experience:	1200 hours of which 1100 hours were on gliders	
Information Source:	AAIB Field Investigation	

History of the Flight

At about 1530 hrs the glider was launched with the pilot-in-command in the left hand seat and another qualified glider pilot in the right hand seat. The object of the flight was to complete a short soaring cross-country flight returning to the launch site. Both pilots were experienced on type and the aircraft was below its maximum authorised weight and within the prescribed CG limits. The weather was fine and the pilots reported that there was good smooth lift with little turbulence out of cloud.

On returning to the landing site, the aircraft was configured with the spoilers in and the flaps in the high speed (reflex) position. Speed was increased to 110 kt which was above the rough air speed of 91 kt and below the Vne speed of 136 kt. The limiting speed for selecting flap to any position other than full reflex was 86 kt. The flight manual states that

"At speeds higher than 86 kt, the elevator control is very sensitive to small stick movements"

In the above configuration and at a height of about 1500 feet agl, the pilot-in-command was holding a moderate forward pressure on the control column and reached forward to operate the trim control which is located forward and slightly left of the flap lever when the latter is in the "reflex" detent. As the pilot's hand reached the trim control, the aircraft pitched up rapidly accompanied by the onset of

moderate g reported by the pilot as about +4. The aircraft then pitched violently nose down to about minus 20° generating sufficient negative g to cause the leg of the pilot in the right hand seat to rise and shatter the windscreen. The aircraft then pitched up to about plus 30°. The g generated was described as "beyond anything I had previously experienced". At this point the right hand wing detached from the aircraft which rolled rapidly to the right. During the pitching manoeuvres, the pilot-in-command states that his left arm was locked to prevent a pilot induced oscillation and that he was unaware of any stick movement. The right hand seat pilot however states that the control column was moving fore and aft but only a little.

The decision was immediately made to abandon the aircraft and the pilots each released the canopy latch on their side of the cockpit. The right hand seat pilot tried to push the canopy off but it would not move. At this time the aircraft was pitching violently and as the left hand seat pilot released his restraint harness he was ejected through the shattered windscreen. The canopy then left the aircraft and the right hand seat pilot made his exit over the right side. Both pilots' parachutes deployed normally and the pilots landed uninjured.

Examination of the Wreckage

The wreckage was taken to AAIB Farnborough for examination and it was apparent that there had been a structural failure of the right wing approximately 3ft from the root. The detached portion of wing had landed 100 yards or so from the main part of the aircraft. The fin and tailplane (which is of T-configuration) had also become detached in the air and had landed close to the wing. Examination of the fin/fuselage attachment structure revealed overload failures of both the front and rear attachments, with the front failing first causing the fin to break off rearwards and to the right. It is thought probable that this was a secondary failure caused by a combination of aerodynamic and inertial forces following the loss of the right wing.

Examination of the wing failure showed that this was also due to overload. The direction of failure was upwards with a slight forward component. The outboard sections of both wings displayed a permanent upwards set and the upper surface wing skins were wrinkled. It was thus clear that the wings had been subjected to a considerable aerodynamic up-load.

The combined flap/airbrake system is operated by a lever moving in a slot on a tunnel between the seats. In addition to the notch-type detents at each end of the slot, there is a third detent approximately 35% aft of the fully forward position. This corresponds to a flap position of 8° up, *ie* a reflex setting. Moving the lever fully forwards causes the flaps to be set 8° down. Movement of the lever aft of the reflex detent progressively extends the flaps into the "airbrake" regime and also deploys the spoilers on the wing upper surfaces. The cockpit lever is attached to a teleflex type cable which operates a lever on top of the wing centre section. This in turn operates the flaps by means of a gearbox and torque tubes.

By aligning the torque tube fracture direction with those of the adjacent stringers and skin fragments at the wing failure position, it was possible to derive the flap setting at the time of the failure. This proved

to be a few degrees down from the fully up position and equated to a flap lever position of approximately 1 inch forward of the reflex detent. On initial examination of the wreckage, the lever was found to be in this position. When the detached right wing struck the ground, scratches were made on the underside. Where these had crossed adjacent flap sections, they would only line up at a unique flap setting: this was the same as that given by the fractured torque tube and showed that no significant movement had occurred during the descent.

The pitch trim system consists of a lever moving in and out of the plane of the instrument panel, the end of which is attached to a leaf spring which in turn bears on a cross tube connecting the two control columns. Thus rearward stick movement is against the spring pressure. The lever is locked by means of serrations on its lower edge engaging on the edge of a slot in a brass block set in the panel. Consideration was given to the possibility of the trim lever becoming unlocked which would have resulted in a violent pitch-up at high airspeed. However the system appeared positive in operation, with no undue wear on either the serrations or the brass block. Moreover such an event did not accord with the crew's recollection. It was noted however that with the right hand placed on the trim lever, it was very easy for the forearm to contact the flap lever with the latter at the reflex detent. The edges of the detent exhibited considerable wear and the spring action which biased the lever into the gated position was weak. The results of ground tests showed that it was easy to inadvertently move the flap lever forward of the reflex detent while reaching for the trim control from the left-hand seat.

No: 1/90 **Ref: EW/G89/06/35** **Category: 1c**

Aircraft Type and Registration:	Bellanca 7GCBC Citabria, G-BAYZ
No & Type of Engines:	1 Lycoming O-320-A2B piston engine
Year of Manufacture:	1973
Date and Time (UTC):	23 June 1989 at 1230 hrs
Location:	Duxford Airfield, near Cambridge, Cambridgeshire
Type of Flight:	Glider-towing
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Right main landing gear damaged
Commander's Licence:	Private Pilot's Licence
Commander's Age:	38 years
Commander's Total Flying Experience:	106 hours (of which 21 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB telephone inquiries.

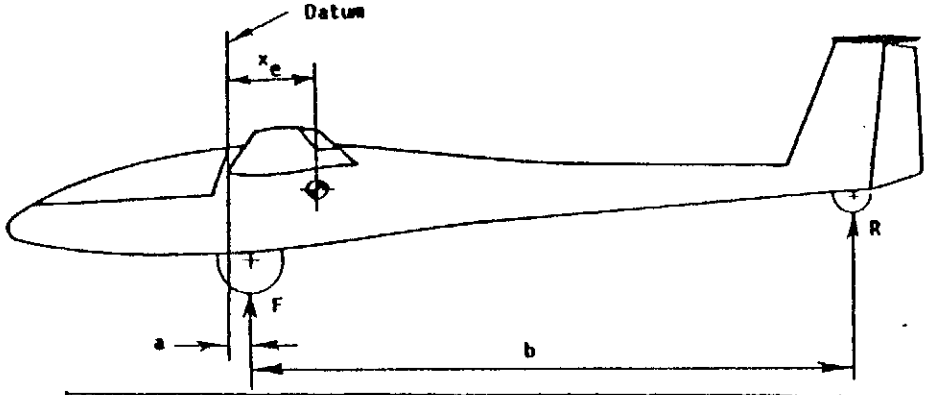
The aircraft was engaged in glider towing from Duxford Airfield. The weather was good, with no cloud, good visibility and a light and variable wind. Grass Runway 24 was in use, 787 metres long. The surface was reportedly reasonably smooth, but hard after dry weather. As the aircraft lifted off on take-off for the fifteenth aero-tow of the day, a grating noise from the area of the right main landing gear was heard. It was then noted that the wheel spat of this landing gear was vibrating abnormally in the airflow. A normal approach and landing was carried out and, after touchdown, the grating noise was again heard. Loss of braking was experienced when the aircraft had almost come to a halt, and it was seen that the right mainwheel was at an abnormal angle. The pilot evacuated the aircraft without difficulty.

The aircraft is a high-winged monoplane with tail wheel landing gear. A main landing gear is strut-mounted from each side of the forward lower fuselage. The lower end of the strut carries a stub axle on which a single wheel rotates on a pair of tapered-roller bearings. A tubular wheel nut screwed onto the end of the axle and retained by a split-pin locates the bearings axially. The thread direction on the axle and nut is conventional right-handed. A spat covering the wheel is supported at its outboard side by a bolt screwed into the end of the tubular nut , and at its inboard side by attachment to the lower end of the landing gear strut. The Bellanca Service Manual specifies main wheel bearing lubrication at 100 flying hour intervals.

Investigation reportedly showed that the outer tapered-roller bearing for the right main wheel had suffered extensive break-up, allowing the wheel to migrate outwards and contact the tubular nut, causing the split-pin to shear and the nut to unscrew. The wheel remained located by the spat only. No signs of bearing corrosion were found.

Investigation revealed no reports of previous failures of this type.

RECORD OF WEIGHING : SINGLE SEATER OR SIDE-BY-SIDE TWO-SEATER : ENGLISH UNITS



EMPTY MASS

Front Support:		**Rear Support:**	
Reading Ft	lb	Reading R_1	lb
Zero F_2	lb	Zero R_2	lb
$F = F_1 - F_2$ =	lb	$R = R_1 - R_2$ =	lb
Empty mass E = F + R =		+ =	lb

EMPTY C.G. POSITION

Front support aft of datum, a in
Front support to rear support, b in

$x_e = (b \times R/E) + a$ = (x /) +
= + = in aft of datum

If the distance of the front support is 'a' inches forward of datum, the above formula becomes

$x_e = (b \times R/E) - a$

* From C. of A. or Flight Manual

COCKPIT LOADS : DATA FOR CALCULATIONS

			Notes
Max. all-up mass (without water ballast)*,	W_o	lb	(i)
Max. mass of non-lifting parts*,	W_{NL}	lb	(ii)
Empty mass	E	lb	
Empty mass of non-lifting parts	E_{NL}	lb	(ii)
Forward CG limit, * + ve aft of datum	x_f	in	
Aft CG limit,* + ve aft of datum	x_a	in	
CG of cockpit load*, + ve fwd of datum	x_p	in	
Empty CG, + ve aft of datum	x_e	in	

MAX COCKPIT LOAD

By total mass, $P_1 = W_o - E$ = − = lb

By max. mass of non-lifting parts,
$P_2 = W_{NL} - E_{NL}$ = - = lb

By CG, $P_3 = E \times (x_e - x_f)/(x_p + x_f)$
= E x (-)/(+)
= x / = lb

Max. load = least of P_1, P_2 and P_3 = lb

MIN COCKPIT LOAD

By CG, $P_{min} = E \times (x_e - x_a)/(x_p + x_a)$
E x (-)/(+)
= x / = lb

Notes: (i) For older types of gliders, only W_o will be stated. If so, ignore the calculation of P_2.
(ii) For more recent types W_{NL} and/or W_o will be stated. If so, find P_2 and/or P_1. To find P_2, E_{NL} must be found. E_{NL} = empty weight of all parts other than the wings. Either weigh these parts directly, or weigh the wings (W_W) and find $E_{NL} = E - W_W$.
If only W_{NL} is stated ignore the calculation of P_1.

WATER BALLAST

Max and min cockpit loads are as calculated above.

Max all-up mass with water ballast*, W_1		lb
Max water ballast capacity*, C_{WB1}		lb
Max water ballast with min cockpit load, $C_{WB2} = W_1 - E - P_{min}$		
= - - =		lb
Max permitted water ballast = lesser of C_{WB1} and C_{WB2} =		lb

For permitted water ballast with cockpit loads greater than P_{min}, see the flight manual

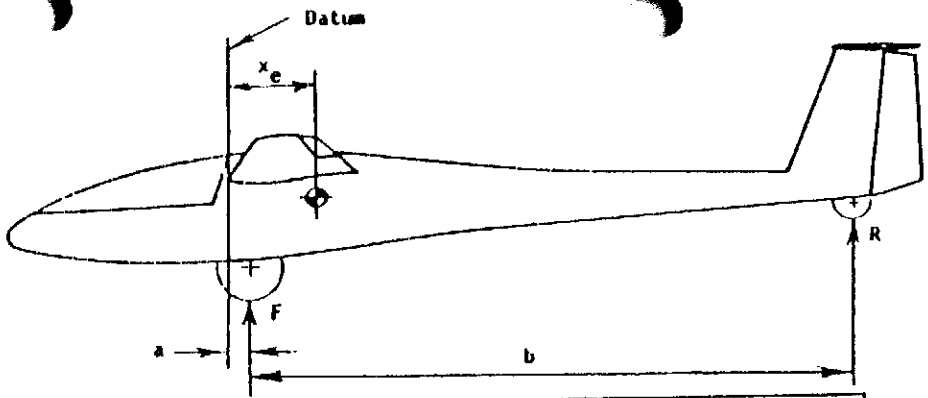
Glider Type: Signature:

BGA No.: BGA Insp. No:

Inspector's Name: Date:

NOTE: If the results of this weighing are significantly different from those of the previous weighing, please provide an explanation.

RECORD OF WEIGHING : SINGLE SEATER OR SIDE-BY-SIDE TWO-SEATER : METRIC UNITS



EMPTY MASS

Front Support:		**Rear Support:**	
Reading F_1	kg	Reading R_1	kg
Zero F_2	kg	Zero R_2	kg
$F = F_1 - F_2$ =	kg	$R = R_1 - R_2$ =	kg
Empty mass $E = F + R$ =		+ =	kg

EMPTY C.G. POSITION

Front support aft of datum, a mm
Front support to rear support, b mm

$x_e = (b \times R/E) + a$ = (x /) +
= + = mm aft of datum

If the distance of the front support is 'a' mm forward of datum, the above formula becomes

$x_e = (b \times R/E) - a$

* From C. of A. or Flight Manual

COCKPIT LOADS : DATA FOR CALCULATIONS

			Notes
Max. all-up mass (without water ballast)*,	W_o	kg	(i)
Max. mass of non-lifting parts*,	W_{NL}	kg	(ii)
Empty mass	E	kg	
Empty mass of non-lifting parts	E_{NL}	kg	(ii)
Forward CG limit, * + ve aft of datum	x_f	mm	
Aft CG limit,* + ve aft of datum	x_a	mm	
CG of cockpit load*, + ve fwd of datum	x_p	mm	
Empty CG, + ve aft of datum	x_e	mm	

MAX COCKPIT LOAD

By total mass, $P_1 = W_o - E$ = - = kg

By max. mass of non-lifting parts,
$P_2 = W_{NL} - E_{NL}$ = - = kg

By CG, $P_3 = E \times (x_e - x_f)/(x_p + x_f)$
= E x (-)/(+)
= x / = kg

Max. load = least of P_1, P_2 and P_3 = kg

MIN COCKPIT LOAD

By CG, $P_{min} = E \times (x_e - x_a)/(x_p + x_a)$
E x (-)/(+)
= x / = kg

Notes: (i) For older types of gliders, only W_o will be stated. If so, ignore the calculation of P_2.
(ii) For more recent types W_{NL} and/or W_o will be stated. If so, find P_2 and/or P_1. To find P_2, E_{NL} must be found. E_{NL} = empty weight of all parts other than the wings. Either weigh these parts directly, or weigh the wings (W_W) and find $E_{NL} = E - W_W$.
If only W_{NL} is stated ignore the calculation of P_1.

WATER BALLAST

Max and min cockpit loads are as calculated above.

Max all-up mass with water ballast*, W_1	kg
Max water ballast capacity*, C_{WB1}	kg
Max water ballast with min cockpit load, $C_{WB2} = W_1 - E - P_{min}$	
= - - =	kg
Max permitted water ballast = lesser of C_{WB1} and C_{WB2} =	kg

For permitted water ballast with cockpit loads greater than P_{min}, see the flight manual

Glider Type: Signature:

BGA No.: BGA Insp. No:

Inspector's Name: Date:

NOTE: If the results of this weighing are significantly different from those of the previous weighing, please provide an explanation.

B.G.A. TECHNICAL COMMITTEE

SUPPLEMENT TO TNS 1/2/90

C of A Renewals Self-Launching Motor Gliders, Ref: CAA Approval of the B.G.A. REF DAI/8378/73.

1) Introduction The CAA (Airworthiness Division) have indicated their intention to survey samples of civil registed aircraft administered by the B.G.A.(and also by the P.F.A., B.M.A.A. etc).

2) Since the location of some 100 such aircraft is so geographically wide-spread, and since clubs, and club members responsible for such aircraft, may not be available other than at weekends, some delays in completing such renewals is likely to arise.

3) To minimise the loss of use of such aircraft, full advantage should be taken of the facility to complete renewals 62 days prior to expiry (Ref LAMS (Blue Book) section 5 Note 2).

4) Having completed the C of A renewal work, the aircraft may continue to operate on the unexpired portion of the current C of A, whilst the C of A renewal submission and/or inspection is processed.

5) Preparation for the C of A Renewal (and/or CAA Inspection).

a) The Working conditions and facilities required to complete such work, must be to a commonsense acceptable standard.

b) Spare parts, whether in stock, or removed from aircraft must be properly identified and stored.

c) Such technical literature as may be essential to the proper maintenance of the aircraft, its engine, propeller, and equipment, must be available.

d) Technical Records such as worksheets, logbooks (Cap 389-Engin and CAP 399 Airframe), rectification worksheets, and LAMS Proforma maintenance schedules, must be available.

The Green Pages of the airframe & engine log books should be updated, for scheduled servicing.

The Red Pages should record the current status of Mandatory Modificatio and Inspections.

(Reference should be made to the B.G.A.'s Annual Compendium of Mandato Modifications and Inspections, and to subsequent TNS, as well as to C.A.A.'s Airworthiness Notices).

6) The Light Aircraft Maintenance Schedule (Lams Blue Book Issue 2. as ammended), is the basis for all Scheduled Maintenance. The third Annu Inspection is referred to as the "STAR" Inspection, at which time the C of A is renewed. The LAMS should be read by all concerned with its implementation. A record of the work carried out to show compliance with LAMS can be made on B.G.A. LAMS Proforma (TNS 10/86). Rectificati should be recorded on a separate Proforma.

7) Aircraft Documentation. The following original copies should be available ON SITE for inspection:

a) Certificate of Registration (CAA Form 71).
b) LAMS Proforma Record BGA LAMS 86.
c) Rectification Worksheets B.G.A. Form/TI.
d) Flight Manual or Operators Manual.
e) Weight & Balance Report.
f) LAMS)Blue Book) Issue 2 + amendments.
g) Certificate of Approval of Aircraft Radio Installation CAA Form 917 AD.
h) Log Books, complete with daily records of flying, scheduled maintenance, rectification, repairs and modifications.
j) Daily inspection record (Article 34 of the A.N.O.).

8) The following documentation has to be submitted to the B.G.A. Office prior to its despatch to CAA:-

a) B.G.A. Form 267 (airframe inspection report).
b) B.G.A. Form 267M (Engine inspection report).
c) B.G.A. Form 267FT (Flight Test Report).
d) Certificate of Airworthiness (CAA Form 958).
e) CAA Forms 202L (From CAA or BGA Office). (Sample copy attached herewith).
f) Cheque for CAA fee - (Ref CAA Airworthiness Notice No. 25 currently £42 per 500kg or part thereof per year of validity i.e. for a 550kg aircraft the fee Payable to the B.G.A. is £42 x 2 x 3years = £252.00 (effective 1/4/90)

9.) Placards and markings on the aircraft should be renewed as required, to ensure that essential limitations are conveyed to the crew. Fuel markings and accuracy should be checked.

10) The OWNERS Name Plate, (in steel) should be displayed in the cockpit area, to comply with the ANO.

11) Radio Installation Approvals (simple communication systems)

a) There is an ICAO/LAMS requirement for the frequency of transmitters to be checked at 48 month intervals.
b) Proforma BGA/RAD/INST/86 can be used to simplify your application to the CAA, for the issue of a Radio Installation Approval (CAA Form AD971).

12) Airworthiness Guidelines

a) B.G.A.Technical Procedure Manual(Tugs and Gliding Related Powered Aircraft) price £1.50
b) CA 520 " light Aircarft Maintenance" £1.50 from CAA Offices, are useful guides to getting things right!

13) Present Your Aircraft For C of A Renewal free of corrosion, well protected paintwise, clean both inside and out, and properly documented

R.B.Stratton
Chief Technical Officer
Feb 1990

Civil Aviation Authority

Safety Regulation Group

SAMPLE

REPORT AND RECOMMENDATION FOR RENEWAL OF CERTIFICATE OF AIRWORTHINESS BY AN ORGANISATION APPROVED IN ACCORDANCE WITH BCAR, SECTION A, CHAPTER A8—15

DISTRIBUTION		
White	—	CAA Area Office
Pink	—	CAA Area Office
Yellow	—	Aircraft Records
Blue	—	Approved Organisation

NOTE: Where an item is not applicable or appropriate the letters 'NA' should be entered.

1 AIRCRAFT DETAILS

1.1 Registration: _____ Type: Copy from C.A.A. Constructor's No: _____

1.2 C of A Category: Private

1.3 Engine Type(s): (In full) Propeller Type(s): (Must be approved by type only)

2 REPORT

2.1 Total hours flown either since manufacture or since initial issue of UK C of A*: _____

2.2 Hours flown during each calendar year since C of A issue or last renewal:

19 _____ hr/19 _____ hr/19 _____ hr/19 _____ hr/Total _____ hr

Accurately completed & checked

2.3 Aircraft tested to Airworthiness Flight Test Schedule No: BCA Issue No: — Date of satisfactory Flight Test: _____

2.4 Radio equipment installed is in accordance with Form AD 917 dated: _____

2.5 Flight Manual/Pilots Operating Handbook/Owners Manual* is in accordance with Flight Manual checklist dated: (Must be completed)

2.6 Date of Current Weight Schedule: Must be completed

2.7 Aircraft is approved for Glider Towing/Parachuting*

2.8 I confirm that all appropriate CAA requirements and Airworthiness Notices — Contents No: Currently No 103, have been complied with.

2.9 I confirm that compliance with the following, as appropriate, is recorded in the aircraft records:

(a) FAA Airworthiness Directive Vol 1 at Bi-weekly Listing No: N/A

(b) CAA Mandatory Modifications and Inspections Summary, Contents and checklist of pages at Issue BCA 1990 dated † TNS

(c) Foreign Airworthiness Directives Vol III, Contents and checklist of pages at Issue List dated No ?

(d) CAA Additional Directives, Contents and checklist of pages at Issue List dated —

2.10 The aircraft complies with Specification/Data Sheet/Fiche No*: _____ Revision/Issue/Edition No: _____

Quote Variations: Leave for Asst office

3 CERTIFICATION

This date must not be more than 14 days from :-

3.1 STAR INSPECTION† completed on: _____

Certified by:

Category *Name* *AMEL No.*

3.2 **Certified that** the appropriate requirements of BCAR, Section A Chapter A2—5 have been complied with and that the particulars contained herein are correct. It is recommended that Certificate of Airworthiness No: _____ be renewed for a period of 36 months, in the Private/Aerial work/Transport* Category

Signed: _____ Name: STRATTEN

Organisation: BCA

Approval Ref. No.: DAT/8378/73 Date: This date

The following documents are attached for CAA records: Flight Test Schedule/Flight Manual Check List/Weight and Centre of Gravity Schedule*

*Delete as necessary †To be in addition to and coincidental with the annual check (CAIP BL/1-15)

AD 202L
170283

B.G.A. CHARGES 1990

A.E.I. RECORD CARD	£10.00	
CERTIFICATES		
'A' Endorsement	£5.50	
'A' Pin Badge	£1.50	
'B' Endorsement	£4.00	
'B' Pin Badge	£1.50	
Bronze Endorsement	£4.50	
Bronze Pin Badge	£1.50	
Silver, Gold & Diamond - per leg	£4.50	
Silver Pin Badge	£1.50	
Gold Pin Badge	£2.00	
UK Cross-Country Diploma - each part	£4.00	or
if applying simultaneously for both	£7.50	
CERTIFICATE OF AIRWORTHINESS		
Glider - issue/renewal per year	£25.00	
Motor Glider - renewal (Falke)	£216.00	(3 years)
COMPETITION LICENCE - issue/renewal per year	£5.00	
COMPETITION NUMBER - issue/renewal per year	£12.00	
INSPECTORS - issue/renewal per year	£15.00	
INSTRUCTOR RECORD CARD	£20.00	
INSTRUCTOR RENEWAL per year	£5.00	
OFFICIAL OBSERVER - issue	£5.00	

29.1.90

Air Accidents Investigation Branch
Department of Transport
Royal Aerospace Establishment
Farnborough
Hants GU14 6TD
Tel: 0252 5 10300

Air Accidents Investigation Branch

THE DEPARTMENT OF TRANSPORT

AAIB Bulletin 12/89

No: 12/89

REVISION OF AIR ACCIDENT REGULATIONS

On 28 November, 1989, the Civil Aviation (Investigation of Accidents) Regulations 1989 come into force. The new regulations contain a number of changes to the 1983 regulations, the most important of which are:

(a) The division of investigations by Inspectors into formal investigations which are the subject of a report to the Secretary of State and field investigations following which information on the accident is to be submitted to the CAA (regulations 2, 10 and 11).

(b) The insertion of a new definition of "serious injury" to conform with the definition in Annex 13 (seventh edition) to the Chicago Convention (regulation 2).

(c) The extension of the scope of the Regulations to accidents involving aircraft not registered in the United Kingdom occurring outside the United Kingdom to enable evidence to be obtained in respect of any such accident in order to assist the state conducting an investigation into the accident, in conformity with Annex 13 (seventh edition) to the Chicago Convention (regulations 3 and 21).

(d) The prohibition of disclosure of the contents of a notice or Inspector's report served under regulation 12 without the prior consent of the Chief Inspector (regulation 12).

(e) The introduction of a requirement that a person requesting a review board shall include in the notice of review the reasons why he claims that his reputation is likely to be adversely affected by the report (regulation 13).

(f) The procedure at the preliminary meeting of the Review Board is amended so that the meeting may be held in private and the Review Board may decide at the meeting not to proceed with the review (regulation 14).

(g) At the hearing of the review the person requesting the review shall present his case first. The Review Board's power to make an order as to costs against a person appearing at the review is extended to include the costs of any other person appearing at the review (regulation 15).

(h) Consequent on the introduction of a power in regulation 14 of the Review Board to decide not to proceed with the review at the preliminary hearing the Secretary of State is given power to direct that the review be proceeded with (regulation 17).

Note: Copies of the 1989 Regulations can be obtained after 28 November 1989 only from HMSO or its agents. The AAIB cannot undertake to provide copies.

Aircraft accident investigations commenced under the 1983 Regulations will be completed under those regulations.

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