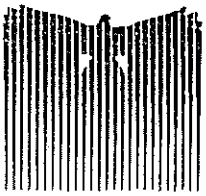
mainair sports



MERCURY

AIRCRAFT MANUAL

Mainair Sports Ltd.
Unit 2, Alma Industrial Estate, Regent Street,
Rochdale Lancs. OL12 0HQ England.
Telephone: Rochdale (0706) 55134
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mainair sports

MERCURY MICROLIGHT MANUAL
Doc ref: ME Manual
Issue 5 : 7th, June 1994.

Aircraft Details

Registration:
Serial Number:
Date:
Batten Issue:
Customer:
Dealer:
Invoice:
Engine Type:
Engine Number:

Contents

This manual covers the following aircraft: MAINAIR MERCURY

Mainair Sports Ltd. Alma Industrial Estate, Regent Street, Rochdale, Lancs. OL12 0HQ, England
Tel. 0706 55134. Fax: 0706 31561. VAT Reg. No. 306 0166 03

FINAL DELIVERY INSPECTION CHECK LIST

Wheels Front
- Fully greased
- Bolts tight
- Free running
- Inflated correctly
- GREASE FRONT STUB
- Brake Correct

Front Fork
- Steering head tight
- Main bolt tight
- Pivot greased
- Mudguard secured (if fitted)
- Brake bolt tight ~~CABLES ON~~
- Rubbers fitted
- Accelerator Cable fixed & wired
- Spring fastened correctly
- Nut caps

Pull Start
- Knot tight
- Pulley free running
- Bolt tight
- Nut caps fitted

Seat Frame
- SEAT STRAP TUBE
- Bolts tight at keel
- Bolts tight at channel
- Tangs fitted on Remstraps
- Folding joint bolts tight & wired
- Spacer fitted at joint
- Nut caps fitted
- SEAT WOOD
- COCKPIT FOOT REST / REAR STEERING

- Bolts tight
- Rubbers fitted
- Nut caps fitted
- End plugs fitted

Cockpit
- Nose Strut fitted
- Rear supports
- Dash mounting
- Nut caps fitted
- Map pocket fitted
- Windscreen fitted
- Stripe and name
- Fabric Rear
- Tank Inlet

Spats
- Check fitted (NO TYRE CONTACT)
- Nut washer & plug

Engine Cover
- Fitted correctly
- Rubber feet

Keel Vertical Strut Junction - Mk II
- Bolts tight and wired
- Pulleys free
- End caps fitted
- SEAT FRAME TELE-SCOPICS DRILLED
- Nut caps fitted

Keel/Axles
- Bolts tight and locked
- End caps fitted
- Nut caps fitted

Axle side struts
- Ear brackets tight & mouldings fitted
- Bolts tight
- Axle tie wire O.K. (if fitted)

Side Struts
- Bolts tight "P" CLIP FITTED
- Rubber suspension greased or Damper O.K
- Ear brackets correct top & bottom
- Main channel bolt tight
- Limitation wires fitted (if fitted)

Wheels - rear
- Both greased
- Both retained correctly(split pin open)
- Inflated correctly
- Free running

Propeller
- Bolted tight (or supplied assembled)
- Nut caps
- Prop disc - FIT PITCH LABEL TO 3 BLADE ARMS
- Prop tape

Reduction Drive
- Pulley alignment checked
- Belt fit to teeth checked
- Main bolts and front bolts tight.
- Drive pin in main pulley or bolts wired
- Belt correct fit
- Belt tension correct
- Bearing housing bolt all tight
- Check top and lower nuts
- Nut caps fitted
- Bearing unit greased
- Spark Plugs fitted and elastic

Rotax Engines
- Oil filled & wire locked
- Drain plug wired
- Breather pipe clipped
- Prop disc & hub drilled out & tight
- Inlet muffler supported & retained
- RADIATOR MTGS & CAP SECURE

Top Engine Mounts
- Main bolts tight
- Rubber mount correctly fitted
- Rubber mount bolts tight
- Nut caps fitted

Lower Engine Mounts
- Main bolts tight
- Rubber mount bolt tight
- Nut caps fitted

Engine Rigging
- Bolts not tight on thimble eyes
- Nut caps

Engine Electrics
- Parts located & placed correctly
- Fixing bolts tight
- Cable strapped up and tie ends cut
- Cables heat shrunk
- Cable loops for folding O.K.
- Spark plug caps retained
- Connector screws tight & lid sealed

Engine Controls
- 2 into 1 wired Throttle box checked
- Foot Throttle free
- Hand Throttle free
- Choke cables free
- Control fittings tight
- Cables strapped & tie ends cut
- Full throttle opening
- filter tight & wired

Fuel Line
- Smooth runs - no kinks in tube
- Ends well fitted Springs fitted.
- Filter fitted correctly
- Breather fitted
- Tank strapped tight CHECK FIT
- Gauge fitted
- Quick-release elastic
- Second Tank fitted

Exhaust
- Safety Tie wire
- Nuts all locked & lock washers fitted
- Rubber mounts tight
- Rubber mounts not distorted
- Prop clearance O.K.
- Exhaust guard fitted

Serial No _____ W _____

DISCONNECT FRONT STRUT, AND FOLD TRIKE DOWN

Airframe
- Check keel/strut alignment

Top Assembly
- Bolts all tight
- connector O.K
- Lock ring in top bolt
- Rear engine rigging

Erect Trike
- Fit front strut
- Check bolt fit on front strut
- Check rings & wing nuts
- Check stickers - MAS & flag
- Throttle placard CORRECT WAY UP ?
- Tank Placard FUEL RATIO CORRECT ?
- Main Placard
- Name Plate

Test Run
- Fuel 50 to 1 ROTAX
- Check no leaks in fuel line
- Check ignition contact
- Check switch operation
- Start and run at least 5 minutes
- General Check over

Additional Parts
- Engine manual - check engine type
- Instruction book and plastic folder
- Serial number
- Constructors initial
- Tool kit with:
- plug spanner and rod,
- screwdrive and spanner,
- Prop bag - fit to check length
- Invoice No. on plans and recorded
- Transit tie + PROP PEG, STRUT TIE
- Seat Belts

Instruments
- Winter A.S.I.
- Thommen Altimeter
- Red line on engine ints.
- TEMP GAUGES

Checked by.....

Agent check.....

Date / /

16th Oct 91

United Kingdom
Civil Aviation Authority

Noise Type Certificate

Aircraft Type Certificate Number: 26H

Name and Type Designation of Aircraft: GEMINI FLASH, FLASH 2, & FLASH 2A, MERCURY

Manufacturer: MAINAIR SPORTS LTD

It is hereby certified that the type of aircraft named in this certificate is acceptable for United Kingdom noise certification. The basis for certification is stated below. Approved variants and their power plants, their maximum noise certificated weights and the corresponding noise figures are as stated on the reverse.

BCAR Section K, Issue 5, Chapter K1-6 3,4 & 5

for the Civil Aviation Authority

13th March, 1986 original Date of Issue

6th September, 1991 Date of this Issue No 3

Approved Variants	Date of Approval	Power Plant	Maximum Noise Certificated Weight	Noise Figure EPL(dBA)
			Take-off	Flyover
			Landing	Approach
Gemini Flash Gemini Flash 2 Gemini Flash 2A Mercury	13.3.86 23.6.87 6.9.91	Bombardier Rotax 503 2-V mounted upright with a 2.58:1 reduction gear - Mainair square tipped 2 blade propeller 62" diameter 40° pitch - Rotax exhaust & after muffler. ESW intake muffler		76.7 dBA

United Kingdom
Civil Aviation Authority

Noise Type Certificate

Aircraft Type Certificate Number: 30H

Name and Type Designation of Aircraft: GEMINI FLASH, FLASH 2, & FLASH 2A, MERCURY

Manufacturer: MAINAIR SPORTS LTD

It is hereby certified that the type of aircraft named in this certificate is acceptable for United Kingdom noise certification. The basis for certification is stated below. Approved variants and their power plants, their maximum noise certificated weights and the corresponding noise figures are as stated on the reverse.

BCAR Section K, Issue 5, Chapter K1-6 3,4 & 5

for the Civil Aviation Authority

8th May, 1987 original Date of Issue

15th October, 1991 Date of this Issue No 4

Approved Variants	Date of Approval	Power Plant	Maximum Noise Certificated Weight	Noise Figure EPL(dBA)
			Take-off	Flyover
			Landing	Approach
Gemini Flash Gemini Flash 2 Gemini Flash 2A Mercury	6.5.87 23.6.87 6.9.91 15.10.91	Bombardier Rotax 503 2-V mounted upright with a 2.58:1 reduction gear - Mainair ground adjustable 3 blade propeller 62" diameter 107° pitch at 12" from centre or Mainair Warp-drive ground adjustable 3 blade, square tipped propeller 62" diameter 113° pitch at 12" from centre - Rotax exhaust & after muffler, ESW intake muffler		77.1 dBA 77.2dBA

NOISE TYPE CERTIFICATE

Aircraft Type Certificate Number :	3SM
Name and Type Designation of Aircraft :	Gemini Flash, Gemini Flash II, Gemini Flash IIA and Mercury
Manufacturer :	Meinair Sports Ltd

It is hereby certified that the type of aircraft named in this Certificate is acceptable for United Kingdom noise certification. The basis for certification is stated below. Approved variants and their power plants, their maximum noise certificated weights and the corresponding noise figures are as stated on the reverse.

BCAR Section N, Issue 5, Chapter N3-8, 3 and 4

for the Civil Aviation Authority

9th July 1996 — original Date of Issue

27th April 1994 — Date of this Issue No 5

Approved Variants	Date of Approval	Power Plant	Noise Figures EPNL dB
Gemini Flash Gemini Flash II Gemini Flash IIA Mercury		Bombardier Rotax 462 (52HP) engine mounted upright with a 2.58:1 Type B gearbox Rotax side-mounted exhaust with after-muffler and K&N intake muffler Meinair, two blade, wooden laminated propeller with round tips, 62" diameter and 48" pitch or Meinair, two blade, wooden laminated propeller with square tips, 62" diameter and 46" pitch or Meinair, two blade, wooden laminated propeller with round tips, 62" diameter and 44" pitch or Meinair, three blade, ground adjustable propeller, 62" diameter with pitch set to 107° at 12" radius or Meinair / Warp Drive, three blade, ground adjustable composite propeller with square tips, 62" diameter with pitch set to 113° at 12" radius	78.4 78.8 78.7 78.2 78.7

CA 1959
01/2004

NOISE TYPE CERTIFICATE

Aircraft Type Certificate Number :	13/94
Name and Type Designation of Aircraft :	Gemini Flash IIA and Mercury
Manufacturer :	Meinair Sports Ltd

It is hereby certified that the type of aircraft named in this Certificate is acceptable for United Kingdom noise certification. The basis for certification is stated below. Approved variants and their power plants, their maximum noise certificated weights and the corresponding noise figures are as stated on the reverse.

BCAR Section N, Issue 5, Chapter N3-8, 3 and 4

for the Civil Aviation Authority

15th March 1995 — original Date of Issue

27th April 1994 — Date of this Issue No 4

Approved Variants	Date of Approval	Power Plant	Noise Figures EPNL dB
Gemini Flash IIA Mercury		Bombardier Rotax 582/38 (51HP, "low noise") engine mounted upright with either a 3.8:1 or 2.47:1 Type C gearbox Rotax side-mounted exhaust with after-muffler Meinair / Warp Drive, four blade, ground adjustable composite propeller with square tips, 62" diameter with pitch set to either 119° or 125° at 12" radius	75.2

CA 1959
01/2004

NOISE TYPE CERTIFICATE

Aircraft Type Certificate Number :	14/94
Name and Type Designation of Aircraft :	Mercury
Manufacturer :	Meinair Sports Ltd

It is hereby certified that the type of aircraft named in this Certificate is acceptable for United Kingdom noise certification. The basis for certification is stated below. Approved variants and their power plants, their maximum noise certificated weights and the corresponding noise figures are as stated on the reverse.

BCAR Section N, Issue 5, Chapter N3-8, 3 and 4

for the Civil Aviation Authority

19th April 1994 — original Date of Issue

19th April 1994 — Date of this Issue No 1

Approved Variants	Date of Approval	Power Plant	Noise Figures EPNL dB
Mercury	19.4.94	Bombardier Rotax 582/38 (51HP, "low noise") engine mounted upright with a 2.58:1 Type B gearbox Rotax side-mounted exhaust with after-muffler Meinair / Precision Propellers, three blade, ground adjustable wooden laminated propeller with square tips, 62" diameter with pitch set to 112° at 12" radius or Meinair / Warp Drive, three blade, ground adjustable composite propeller with square tips, 62" diameter with pitch set to 118° at 12" radius	78.6 78.3

CA 1959

NOTICE

THIS FLEX-WING AIRCRAFT IS CERTIFIED FOR NON-AEROBATIC FLIGHT ONLY. MAXIMUM BANK ANGLE 60° MAXIMUM PITCH ANGLE 30° UP OR DOWN. NO SPINS, WHIP STALLS, TAIL SLIDES OR WING OVERS.

WARNING.

LOSS OF FLIGHT CONTROL MAY RESULT FROM NEGATIVE LOADING WHICH CAN OCCUR FROM STEEP PITCH AND/OR ROLL MANOEUVRES IN EXCESS OF THE ABOVE VALUES. IT IS DANGEROUS TO CONDUCT STEEPLY BANKED REVERSE TURNS, (FIGURE OF 8) WING OVERS AND DEEP STALLS AND TO FLY THE AIRCRAFT AT SPEEDS BEYOND VNE. POSITIVE ACTION MUST BE TAKEN TO AVOID YOUR OWN AND OTHER AIRCRAFT'S WAKE TURBULENCE.

BE AWARE OF THE FLIGHT LIMITATIONS AT ALL TIMES AND OPERATE THIS AIRCRAFT IN A SENSIBLE AND CONSIDERED MANNER.

POSITIVE LOADING MUST BE SUSTAINED AT ALL TIMES.

Flex-wing aircraft have suffered structural failure as a direct result of pilot control loss. If a sustained negative load is applied in flight the trike unit is capable of contacting the wing structure with great force and severe structural damage will result. It is very dangerous to fly the aircraft outside the limits stated and it is not designed to offer any aerobatic capability whatsoever.

Pilots should not attempt steep wing overs and roll reversals since the inertia of the trike unit may cause the bank angle to exceed that intended. As a guide, if the control bar upright tubes are level with the horizon you are at a bank angle of 65° and have exceeded the limitations. The flight limitations are maximum values. There is no reason why they should ever be reached in ordinary flying.

Please fly this aircraft sensibly, maturely, and in a responsible manner. See also further information on page 13 and 13A.

AMENDMENT RECORD

Date	Amendment	Reference
3rd Feb 92	Pages 5, 16 + 26A Altered to include 503 TP1 Engine	Issue 2
1st Oct 92	Page 26 Altered. Wiring Diag Changed Mod 69	Issue 3
1st Dec 93	Pages 5 & 12. Bank Angle Changed.	1st Dec 93
7th June 94	Rotax 462 and 582 Engines Added Mod 75	Issue 5

GENERAL INFORMATION

1. Operating Limitations
This aircraft must be operated under visual flight rules (VFR) at all times. Minimum equipment to operate under VFR is as follows: Altimeter - recommend Winter 0-10000ft. Airspeed indicator - recommend Winter 0-100mph. Appropriate Maps - air charts for operational areas.

2. Cross Wind Conditions - Take Off and Landing
Cross winds to 15 knots (17mph) have been demonstrated, but we would recommend an 8 knot (10mph) maximum. No special techniques are required, but be ready to correct steering direction on touch down, and to prevent the upwind wing from rising.

3. Power Off Landings
Maintain minimum airspeed of 36 knots (42 mph). Ensure adequate obstacle clearance. Beware of landing short, and practice techniques under controlled conditions.

4. In-flight Re-Start
We do not recommend switching off the engine in flight unless practising under controlled conditions. If it is necessary to re-start in the air, set approximately 20% throttle and do not use the choke if the engine is warm. Control bar position should be neutral.

5. Load Distribution and C.G.
Maximum total all-up weight must not be exceeded. Single or dual seat occupancy will affect the control bar position.

6. Flight Limitation Placards
The placard which details flight limitations is on the main keel tube immediately behind the front fork. The throttle direction placard is on the left hand throttle housing adjacent to the throttle lever. The fuel tank placard is mounted on the rear engine cooling duct on aircraft fitted with a Rotax 503 engine, and on the radiator if fitted with the Rotax 462 or Rotax 582 engine. The placard for the long range fuel tank is on the side strut immediately adjacent to the fuel filler neck. The registration plate is fastened to the main seat channel. The serial number is stamped on the end of the main seat channel.

7. Minimum Cockpit Load
The minimum cockpit load is defined to ensure full flight control of the aircraft. Ballast can be added using a Mainair Boss Ballast bag, this is an approved container that straps into the rear seat, and is the only means by which ballast can be carried.

8. Fuel Tanks
The aircraft is fitted as standard with a 22 litre tank beneath the engine, and has an option for an additional 22 litre tank beneath the passenger seat. The rear tank is left in position for rigging and derigging, but is quickly removable for cleaning and re-fuelling after landing out. To remove the tank, detach the right hand engine strut at the ear bracket position with the quick release pin, and unscrew the fuel union at the fuel tap. The under seat tank (long range tank) has to be removed during rigging and derigging. To install, the seat support straps are slipped off the retaining tube at the main seat channel, and the seat slid forwards. The tank is then positioned onto the trike keel. The tank strap then fits underneath the keel, taking care not to trap the pull start rope, around the monopole and is then pulled tight across the front of the tank so as to press the tank

7th June 94
Issue 5

SPECIFICATIONS

Empty Weight:	- Mercury 503 146 kg - Mercury 462 150 kg - Mercury 582 153 kg - Mercury 582 157 kg (With 3.47/1 Reduction)
Max total all-up weight	- 370 kgs
Maxoccupant weight	- 180 kgs
Max load factor	- 4G P. 2G N.with 1.5 safety factor
Load composition	- 1 or 2 occupants
Min all-up weight	- 234 kgs
Fuel capacity	- 4.75 gallons (15.6 kg) — or 9.5 galls with extra tank
Stall at min load (Height Loss)	- 22 knots (25MPH) (80')
Stall at max load (Height Loss)	- 24 knots (28MPH) (90')
Stall height loss at 30° bank	- 80 ft
Max nose down at stall	- 8°
Cruise speed	- 43 knots (49MPH)
Never-exceed speed (VNE)	- 77 knots (89MPH)
Min approach speed - engine at idle	- 36 knots (42MPH)
Best rate-of-climb speed	- 36 knots (42MPH)
Landing run at max load - clear 15 M obstacle	- 230M
Take-off run at max load- clear 15 M obstacle	- 181M
Climb rate fully laden	- 130M/min (400 fpm)
Climb rate min load	- 300M/min (1000 fpm)
Max wind operating conditions	- 18 knots (21 MPH)
Max cross wind conditions	- 8 knots at 90° (10 MPH)
Power off rate of descent	- 167M/min approx
Power off ground distance covered	- 1315M/min (7.84 : 1)

Engine and Propeller Limitations

Rotax 503
(See Engine Manual For Full Details)
Power Output 46 hp at 6500 rpm
Maximum rpm 6800
Maximum CHT 250 degC (480 degF)
Maximum EGT 650 degC (1200 degF)
Fuel Mix 50:1
Fuel Spec. MON 83 or RON 90 Octane (Unleaded Acceptable)
Oil Spec. 2 Stroke Oil for high performance engines

Gearbox Ratio 2.58/1
Propeller Options:
Hainair Sports
62" x 40"

3 Blade Ground Adjustable (Wood)
62" diameter 107deg at 12" Pitch.

3 Blade WD Ground Adjustable
62" diameter 113deg at 12" Pitch

Rotax 462
(See Engine Manual For Full Details)
Power Output 52 hp at 6500 rpm
Maximum rpm 6800
Maximum CHT 180 degC (355 degF)
Maximum EGT 650 degC (1200 degF)
Maximum Coolant 80 degC (175 degF)
Fuel Mix 50:1
Fuel Spec. MON 83 or RON 90 Octane (unleaded allowed)
Oil Spec. 2 Stroke Oil for high performance engines

Gearbox Ratio 2.58/1
Propeller Options:
Hainair Sports
62" x 44"

3 Blade Ground Adjustable (Wood)
62" diameter 107deg at 12" Pitch

3 Blade WD Ground Adjustable
62" diameter 113deg at 12" Pitch

Rotax 582-2V (40 kW)
(See Engine manual For Full Details)
Power Output 53.6 hp at 6000 rpm
Maximum rpm 6400
Maximum CHT 150 degC (300 degF)
Maximum EGT 650 degC (1200 degF)
Maximum Coolant 80 degC (175 degF)
Fuel Mix 50:1
Fuel Spec. MON 83 or RON 90 Octane (unleaded allowed)
Oil Spec. 2 Stroke Oil for high performance engines

Gearbox Ratio 2.58/1
Propeller Options:
3 Blade Ground Adjustable (Wood)
62" diameter 112deg at 12" Pitch

3 Blade WD Ground Adjustable
62" diameter 116deg at 12" Pitch

Gearbox Ratio 3.47/1
Propeller Options:
4 Blade WD Ground Adjustable
62" diameter 125deg at 12" Pitch

Note: Recommended max engine temperatures and speeds can be exceeded for very short periods without immediate damage. However, you are strongly recommended not to exceed the limitations at any time. Engine speed (RPM), cylinder head temperature and exhaust gas temperature guages are all available to enable accurate monitoring. If the aircraft is operated in accordance with the above specifications under ISA + 15°C max and the fuel air mix is correctly adjusted, the limits recommended will not be exceeded. Beware of high temperature days and long periods of stationery running.

PERMITTED MANOEUVRES.

Pitch angle - nose up/down not to exceed 30°. ALL AEROBATIC MANOEUVRES ARE PROHIBITED. including: Whipstalls, Wingovers, Tailslides, Loops, Rolls and Spins. Angle of bank not to exceed 60°.

GENERAL SPECIFICATIONS

Airframe	- multi sleeved 2 1/8"- 2"- 1 3/4" x 17 swg - Drawn seamless HT - 30 - TF Anodised.
Aluminium fittings	- NS8 sheet & H30 machined components
Bolts & Nuts	- Airframe bolts AN Series 3/16,¼,5/16, & 3/8.
Rigging	- 7 x 7 x 4mm Stainless steel, 3 & 2½mm coated 7x7 stainless steel.

Dimensions

Span	- 10.55 MTS
Height - Kingpost to Trike connection	- 1370 MM
Height - Base bar to Trike connection	- 1500 MM
Overall height	- 2870 MM
Length - nose to tip of keel	- 3300 MM
Rigged weight of wing	- 48 kg
Standard de-rigged length (wing)	- 6000 MM
Short packed de-rigged length (Wing)	- 4500 MM

Wing stressed to + 4 - 2 with 1.5 safety factor at all up weight of 370 kg (+6-3)

Dimensions - fully-assembled Flash Wing/Gemini Trike

Height - floor to kingpost top	- 3.83 Mts
Width - batten tip to tip	- 10.6 Mts
Length - wing tip rear to cockpit nose	- 3.46 Mts

firmly onto the keel and into the bracket. Fit the hose connector and retaining elastic and prime fuel, checking for leaks. Ensure the fuel line is not kinked or trapped and position the breather tube near the side strut, and fit the fabric skirt over the filler neck. After fitting and checking, slip the seat loops back up between the channel and seat frame back and locate them on the retaining tube.

9. Fuel Priming

To prime the tanks, turn the fuel tank selector to the required tank and squeeze the primer bulb until you can feel it full of fuel, then select the other tank and repeat. The fuel tanks are now ready for in-flight fuel tank changes. However, when changing tanks it is always advisable to do so with an emergency landing field in sight, just in case you have not fastened the connections properly.

10. Rubber Suspension Bushes

The telescopic side struts contain rubber balls which act in compression. These are lubricated at the factory with rocol MX33 grease. They should be checked and re-lubricated every 50 hours.

11. Single Seat Operation

Ensure that the rear seat belt buckles are all firmly connected together to prevent them reaching the propeller. Adjust the seat strap until the position is comfortable.

12. Tyre Pressures and Tyre Creep

The rear wheels should be inflated to 15psi, the front wheel if suspension is fitted should be inflated to 22 psi, otherwise as per the rear wheels. Over inflation gives a harder ride but under inflation can lead to tyre 'creep' and inner tube valve failure. We recommend that you paint a white line on the tyre and rim and check for 'creep' during your post and pre-flight inspections.

13. Carburettor Icing

Icing can and will occur in certain meteorological conditions. The air-cooled Rotax 503 engine has a modification to the engine cooling air to be directed onto the carburettor body. The 462 and 582 engines have a 'hot coil' system which warms the fuel and hence slightly raises the carburettor bowl temperature.

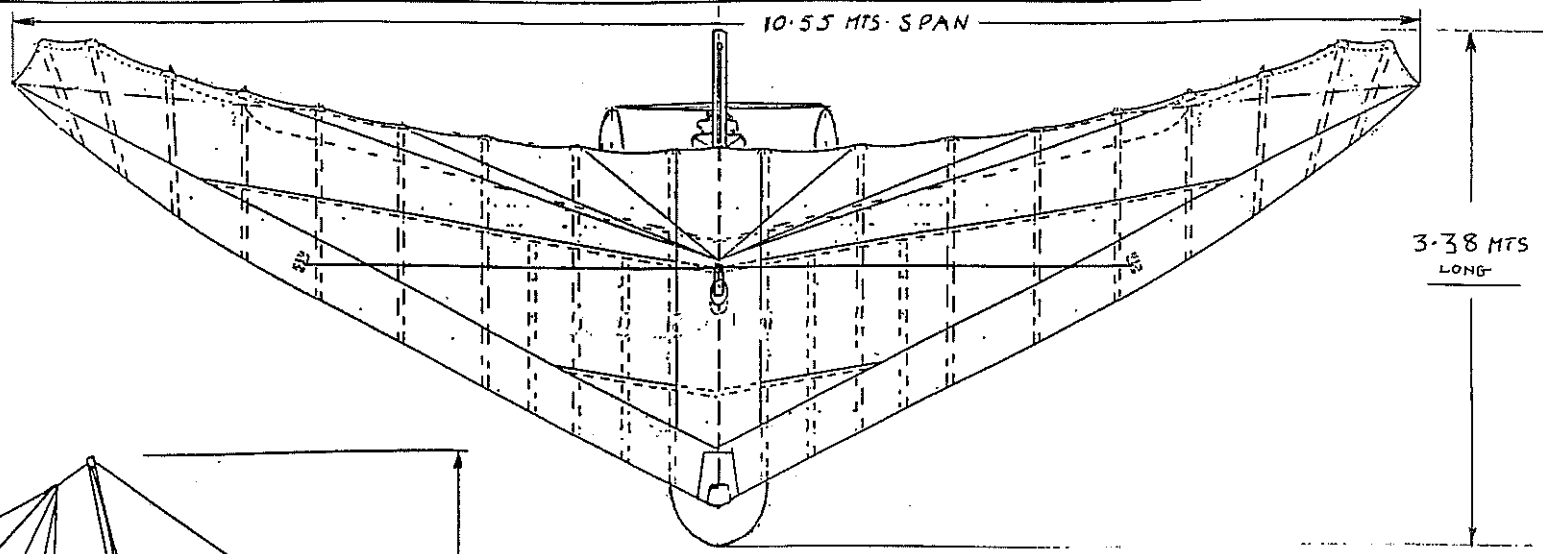
14. Front Wheel Brake

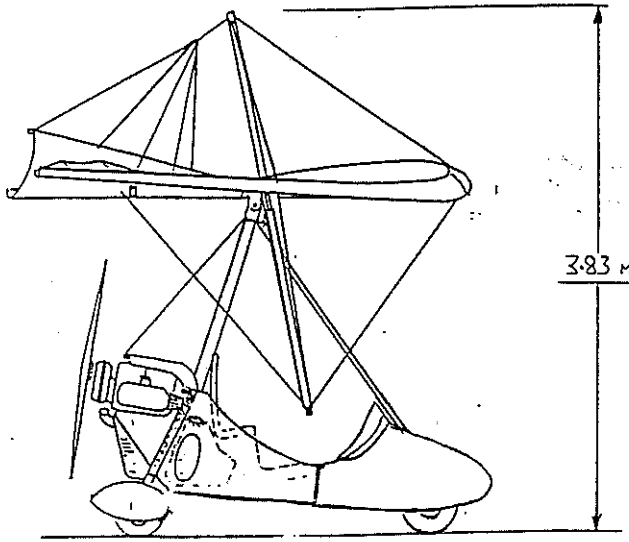
Dust from the brake shoes must be cleaned out on a regular basis. The brake can be adjusted on the cable ends, as required.
The front drum brakes are intended as power check and taxing aids only, they should be operated with caution and not applied at speeds in excess of 15mph other than in an emergency. Airframe wear and tyre creep can occur from overuse of this lightweight braking system.

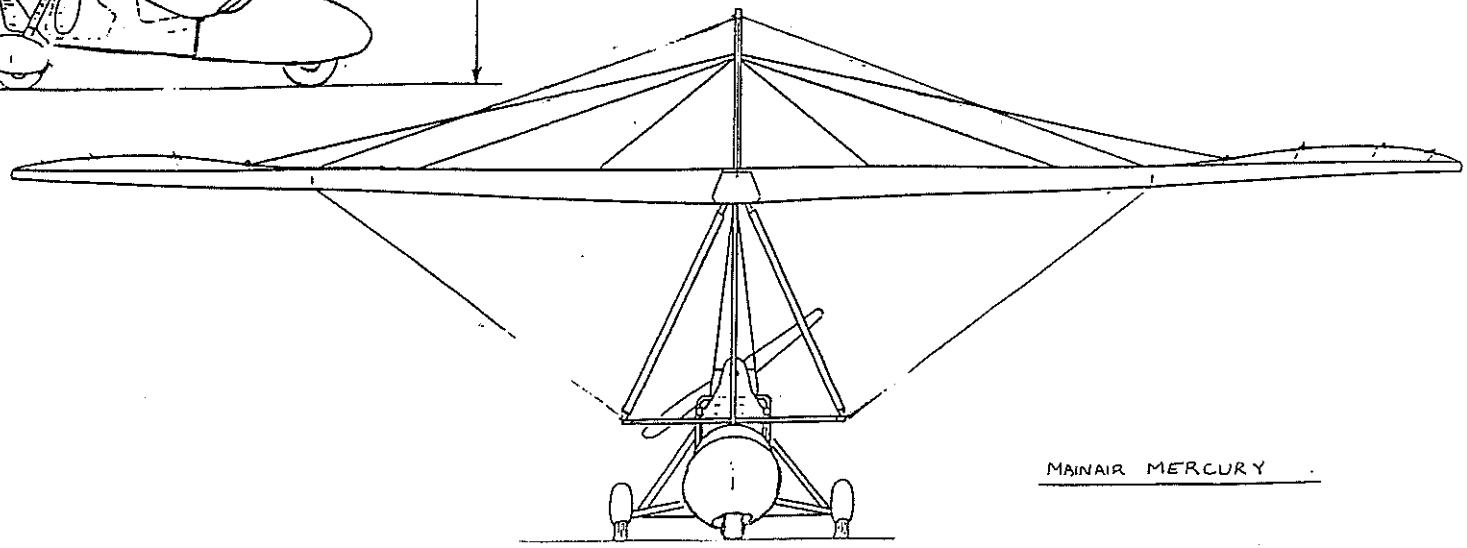
Power Operation at Light Weight

When operating solo, pilots should take care to operate the throttle sensibly. Excessively steep climb outs are unsafe since they lead to nose-high attitudes and engine failure in this situation may result in insufficient time/height to recover.

In addition, engine failure at steep climb attitudes may lead to a whip stall or tail slide situation, which can and has resulted in structural failure and break up of the aircraft in flight. The flight limitations of this aircraft must never be exceeded, and pilots are warned that when operating at low cockpit loads the high power available means great care must be taken to ensure the limits are observed.







MAINAIR MERCURY

DWG NO.	99-44-MERGGA
TITLE	GA MAINAIR MERCURY
DATE	5TH AUGUST 91
SUPERCEDES	

REF	DATE	AMENDMENT

GEMINI 2 TRIKE UNIT (ROTAX 503)
FLASH 2 ALPHA WING

WING DRAWINGS

FGA SERIES

TRIKE DRAWINGS

99-00 SERIES
99-44 SERIES

COMPUTER FILE NAME

440 DUAL
FLASHDWGS

DRAWN BY	
CHECKED BY	
ISSUED BY	

MAINAIR SPORTS LTD
TEL: 0706 55134

TOLERANCES UNLESS STATED OTHERWISE
GENERAL ± 1·0MM DIAMETERS ±0·05MM

PRE-FLIGHT CHECK LIST

Wing

1. Apex block
2. Trike block
3. Control Frame
4. Side wires
5. Inspection panel
6. Left hand tip (check index pin located)
7. Trailing edges
8. Batten attachment
9. Keel and fin (check pull back pin rings located)
10. Right hand tip (check index pin located)
11. Side wires
12. Inspection panel
13. Nose fairing
14. Nose catch
15. Kingpost (check over-centre catch locked)

RIG WING TO TRIKE

Trike

1. Trike connection - ring fitted - fore aft location
2. Back-up loop
3. LH seat lock
4. Exhaust check
5. LH axle and wheel assembly
6. Gearbox
7. Prop fixing and blade check
8. RH axle and wheel assembly
9. Carb attachment - plug caps tight
10. Fuel line and connections - clean filters
11. Tanks secure and full - breather clear - correct tanks selected
12. RH seat lock
13. Rear seat fitting tube
14. Cockpit, instruments - required maps
15. Front strut
16. Nose wheel
17. Check non-wire lock nuts

PRIOR TO FLYING

1. Full control movement
2. Ignition off
3. Fuel primed - choke as required
4. Seat belts fitted
5. Helmets fixed
6. No loose items
7. Intercom clear
8. Prop clear
9. Start engine - run for minimum of 5 minutes or until CHT reads 250° F min
10. Check clear prior to launch

AIR LAW

All microlight aircraft must operate within current air law. All pilots must familiarise themselves with air law, particularly with C.A.P. 85. Much of the U.K. is subject to flying limits, and there are many and varied air lanes and special areas around airports and similar installations. You should purchase a current air space map and familiarise yourself with the limits shown. Failure to comply with certain restrictions may result in a heavy fine and confiscation of the aircraft. Mainair Sports stock many useful publications and air maps.

TRANSPORT

Trike. - We recommend that the Trike unit be trailered to and from the flying field on Mainair's Roadrunner trailer means that the Trike unit will be easy to load and safely transported utilising the tie downs for security. The Trike unit may be transported with a monopole upright in the rigged position, or folded down with the monopole resting on the transit 'Y' yoke. The long transit tie should be used to prevent the Trike unit rolling from side to side during transit. This should be fastened to one main axle leg, wrapped around the propeller transit insert (the tube fitted with a bright yellow flag) and fastened off to the other main axle leg.

Glider Wing. - Before the wing is transported make sure that it is correctly packed, and that the protection padding is corrrectly located. The wing may be tranported on a vehicle roof-rack provided that some front support is provided for the wing overhang. Mainair supply a glider rider support system that conveniently attaches to the bonnet of the vehicle using suction pads, and is adjustable in height to suit different vehicles. A light weight aluminium ladder forms a convenient base to support the wing over its entire length. In the event of a vehicle that cannot be fitted with a roof-rack, the Mainair roadrunner trailer can be provided with wing support brackets. The wing should be secured with adjustable transit ties available from Mainair Sports Ltd.

OPERATING AREAS

Microlights are aircraft and should be operated as such. Stay away from populated areas which will be restricted by buildings, trees, power lines etc. Fly from airfields and open places, and if you have to consider whether a field is long enough to take-off in, it probably isn't. Tafe-off runs vary with the trike model and conditions, the air density of the day, and the pilot's skill and weight. Until you are totally familiar regarding the size of field needed, fly from recognised microlight airfields or huge open areas. Be ready for the engine to fail 50ft up and make sure you have lots of room ahead to make a safe landing. Treat your field and the population around it with consideration. Having gained all your initial experience elsewhere at a recognised site, launch from your field and then fly away. The quickest way to annoy people living near a used field is to continually fly in and out subjecting them to what is in reality, a pretty aggravating noise, especially at week-ends. If they hear you just once or twice during the whole day they are most unlikely to complain and you have a chance of keeping your field. Obey air law at all times and do not fly beyond your limits. Weather knowledge has to be learned. There are many useful publications on micro meteorology which should be studied. A wide range of books covering all aspects of microlight flying is available from Mainair Sports Limited.

FLIGHT CONTROL

The Mercury is controlled by standard flex wing techniques, although the speed of response and lightness of action should be borne in mind for those pilots converting from other makes of wing.

Control Bar Movements	Aircraft Response
Bar pulled rearwards	Nose pitched down - aircraft speeds up
Bar pushed forwards	Nose pitch up - aircraft slows down
Bar pushed across to the right	Aircraft rolls to the left
Bar pushed across to the left	Aircraft rolls to the right

Conventional 3-axis pilots unused to flex wing control will find the control bar movement and resulting reactions confusing at first. They will have to positively think about all movements, particularly in stress situations. A few hours of flight time is usually enough to sort out control error action but it is absolutely essential that 3-axis pilots undertake a flex wing conversion course on a dual-controlled machine before flying the Mercury.

Stall Characteristics - "See additional note page 13".

Fully loaded, the stall occurs at 24 knots and is clean and easily handled. As the speed is reduced, aft bar pressure increases and noticeably so immediately prior to the stall. You will also notice a slight nodding tendancy and a stiffening of roll response. As the wing stalls, the nose pitches down and corrective action is to bring the bar back slightly to prevent the aircraft re-entering the stall state. If the control bar is held lightly enough to damp out oscillations, the aircraft will automatically recover from a stall and return to trimmed flight. Slight wing drop may be found but it is easily corrected. The Flash wing is remarkably stable, and even if stalled in a turn will not spin, but pitch down, increase air speed and roll out into a shallow turn or straight flight.

General Flight Control

It is important that the wing is tuned to ensure equal wing section and therefore balance trim. A wing which exhibits a constant turn when flying 'hands off' will be tiring to fly and uncomfortable in turbulence, particularly when landing or taking off. A properly tuned wing will fly completely 'hands off' throughout the whole range of power settings, although a slight tendency to turn owing to the torque reaction of the engine will always be present. The roll control response will increase as the speed increases, and turns are very easy to co-ordinate. Prior to moving the bar sideways to roll, speeds should be increased by pulling back slightly. Once the aircraft has started to roll it should be pitched around the turn by moving the bar forwards. This action should be a smooth, fluid action; the bar movement completely related to both speed, and angle of turn. Steeper turn angles require more speed, more roll and more pitch. Shallow turns, less of all three. Great care must be taken to ensure both sufficient speed for the rate of turn required and to ensure that too much 'pitch' (bar forward) is not applied or the wing will stall in the turn. Clean and co-ordinated roll control can be accomplished easily by thoughtful practice, and pays dividends in smooth and efficient flying.

Microlighting is, in general, a fair weather sport but light rain has little effect on flying control. You will notice that the wing becomes heavy to fly and the stall speed increases slightly, but the effects are minimal. Ice, however, is more serious and can occur through icing meteorological conditions, or by flying a wing which is wet from the bag, without giving it time to dry out. Severe icing can affect handling and speeds markedly and at the first sign you should cease flying or fly below icing conditions.

Take Off

Take offs are straight forward and the wing will lift the weight and hence fly when the correct air speed is reached. The correct technique is to hold the wing back slightly during the initial stages of the take off run so as to reduce the drag and increase the acceleration. At around 20 mph, allow the bar to move forward, and as the aircraft accelerates push forwards slightly until the aircraft un-sticks. The trike unit will swing forward under the wing, and a wise pilot will hold the aircrafts climb rate down until a safe climb out speed is reached. Never, ever, push the bar full out holding it there as the aircraft claws its way skywards. Climbing on the propeller this way is inefficient, indicative of poor-piloting technique and very dangerous in the event of turbulence or engine failure.

During all aspects of flight the aircraft must be flown so that in the event of engine failure or loss of power, safe landing areas are always within reach. Providing the aircraft is being flown sensibly, an engine failure is not serious, and any competent and well trained pilot should be able to cope. Fully loaded the engine-off sink rate is around 300/400 feet per minute and increases rapidly as speed is increased.

Landing

The Flash copes well with cross-wind landings, but sensible pilots take great care to land exactly into wind wherever possible. Make your approach about 10 knots above the stall and be aware of wind gradient during strong wind days. The flare is conventional, but the light pitch response can cause over correction and 'ballooning'. As soon as the wheels touch down pull hard back on the bar which will eliminate bounce and slow down the aircraft. If a cross-wind landing is unavoidable, make a conventional approach, but be ready for the twisting of the trike unit as soon as the rear wheels touch. Whenever possible utilise whatever into-wind distance you can use - i.e. across the runway, ground steering across wind when firmly on the ground. Cross-wind landings up to 8 knots should present no real problems, but exercise great care in stronger conditions, and because of the high torsional loads which can be imparted to the trike upright tube and wing keel tube, always carry out detailed inspection after every cross-wind landing.

Ground Handling (see additional note sloping fields, page 13A

Flex wing microlights are unique in their ground handling ability. In winds over 5 knots, always turn the aircraft until one wing is resting on the ground which will help stabilise the craft until you are ready for flight. A ground picket or weight (fuel can or similar) is very useful to tie the wing tip to in order to prevent damage to the tip and to hold the wing steady. When taxiing cross wind do not make the mistake of letting the up-wind wing go down as this will greatly increase the chances of the craft blowing over. Instead, try to hold the wings dead level as this will present the minimum obstruction to the cross wind. When taxiing down wind, push the bar out to prevent the wind getting under the sail and putting you out of control.

Flying

Trike flying is pure flying. Never before has there been such a simple-to-fly craft which is so efficient. Its simplicity can be deceptive, and just as you are sitting back enjoying yourself, things can go wrong. Engine failure is the main problem and in general there are two main reasons : fuel or ignition.

Frequent inspection and maintenance is the only path to enjoyable flying. Always fly within easy reach of landing fields, and beware of the temptation to show off in front of friends and spectators. So many good and experienced pilots have been killed doing just that. Fly sensibly, for fun, and with care, your Mercury will give you many hours of pleasurable flying.

Additional Notes - AEROBATIC MANOEUVRES & STALL CHARACTERISTICS.

Stall Recognition

Pilot flight instruction manuals will clearly define all aspects of stall behaviour and the Flash stalls just like any other aircraft. Stalls within the flight envelope are perfectly safe to demonstrate providing you have sufficient altitude - minimum 1,000' - and the correct entry and recovery techniques are used. To demonstrate the stall, the bar is slowly pushed away and the airspeed allowed to decay at about 1 mile per second. At around 35 MPH the aircraft will feel heavy to roll and very sluggish. It will be descending and you will feel quite high back pressure on the control bar as the wing attempts to automatically pitch its nose down to recover airspeed. This is the incipient stage of the stall and to recover, simply allow the bar to return to a neutral position and the aircraft will pitch down slightly and increase air speed. If you continue to push the bar out, the back pressure will increase and at around 26/30 MPH (dependant on load) the wing will stall resulting in very high back pressure and immediate nose drop. Hold the bar out slightly until airspeed starts to increase and then return it to neutral position. Very smooth air conditions, clean piloting techniques and light cockpit loadings may make the wing difficult to stall. It may stabilise in the incipient stall state and simply " mush " descending quite rapidly at a low airspeed but not actually stalling and pitching down. Simply recover as for an incipient stall. Be aware of the reversing pressure forward and rearward on the control bar as the nose drops and as airspeed is increased.

Whipstalls

A whipstall is defined as a stall break induced from an angle above 30°. At the stall break the wing will pitch sharply down and accelerate rapidly. The steeper the entry to this break, the steeper the subsequent d ive and a high whipstall where airspeed decays significantly can lead to an irrecoverable situation. If the wing looses all airspeed at a high angle of attack, the nose drops sharply and it accelerates down and forwards. It can easily fly around the mass of the trike unit and occupants, completely inverting the aircraft. WHIPSTALLS ARE EXTREMELY DANGEROUS. If a whipstall is entered by accident or careless piloting, under no circumstances must the control bar be pulled back at the break or immediately after the nose pitch down recovery has begun. Action of this kind may make a survivable whipstall into an unsurvivable one. The correct approach is to hold a bar out past the neutral position until the airspeed has built up holding off the back pressure caused as the nose rotates down. Be ready for a very high forward pressure as the airspeed goes up and the wing starts to recover. There is a high chance of a second and steeper whipstall being entered at the recovery from the first and one way to prevent this is to bank the aircraft as the speed starts to rapidly decay after recovery. This will put you into a high speed turn from which you should be able to recover normal flight.

Wingovers

This manoeuvre is again prohibited and extremely dangerous. A wingover is entered by diving the aircraft and as it climbs, applying high bank at the top. It may be used to avoid a whipstall but the pilot should not be in that situation in the first place. The high energy retention of the Flash and strong pendular effect can result in the trike unit being swung up and around the wing past the vertical and almost into an inverted spiral. Since this situation only occurs at the top of a steep climb, airspeed is obviously lost and the aircraft can invert. This extremely hazardous situation can also result from a high bank turn which is rapidly

reversed IE entering a steep say left hand 360° turn from a steep right hand one. At the cross over between the two turns the trike unit is accelerated and can induce a far higher bank angle than that required or anticipated by the pilot.

INVERTED FLEXWINGS DO NOT FLY. THE TRIKE UNIT WILL FALL INTO THE SAIL AND SEVERE STRUCTURAL DAMAGE WILL RESULT.

High Speed Stall

The stall speed increases as the load increases. A manoeuvre which induces " g " loadings (60° bank turn = 2g) will also increase the stall speed. If the Flash is flown in a steep bank turn and the bar is pushed out, it will lose airspeed and may enter a stall at a surprisingly high speed. During special flight tests by company test pilots a high speed stall was induced at a speed in excess of 75 MPH. A high speed stall entered during a steep turn will cause the aircraft to tighten its turn and may result in a vertical or near vertical dive.

WARNING

DO NOT EXCEED THE LIMITATIONS - 60° BANK ANGLE 30° PITCH - NON AEROBATIC

POSITIVE LOADING MUST BE SUSTAINED AT ALL TIMES

WAKE TURBULENCE

As an aircraft flys it leaves behind it severely disturbed air. Avoid flying, taking off or landing closely behind another aircraft, and be particularly careful of flying into your own wake turbulence. It is very easy to fly into your own wake during 360° turns and the effect can be quite violent. Microlights have been rolled as much as 90° turns by flying into their own wake. If you already happen to be in a bank, the potential results are self evident. Wake turbulence is greatest at high G loadings, during turns or slow flight.

Ground Handling - Sloping fields.

The Aircraft is very stable, but be aware that the wing high above your head can affect the stability, particularly on sloping ground.

Wing

1. Select a clean, dry area and lay the wing down, opening the zip to reveal the control frame and underside of the wing.
2. Open out the control frame and attach the corner joint.
3. Lift the wing from the front and rotate it so that the wing is now laying on the ground with the assembled control frame flat on the ground underneath.
4. Remove all the sail ties and open each wing about a metre. Lift the kingpost and, checking to ensure the wires are untangled, fit it into the nylon apex block through the hole in the top surface of the sail.
5. Tension the rear fin wire over centre lever, ensuring that it clips down tightly.
6. Open the wing in stages, one wing at a time to prevent damage to the cross tube joints.
7. Ensure that all wires are untangled and free from twist, particularly at the connections. Locate the cross tube tensioner cord and pull back as if to rig the wing, but do not attach the tangs, allowing the wing to relax in a fully-open position.
8. Fit the battens starting with the in-board main battens and working out-board towards the tip. Do not force the battens if they seem hard to push fully home. Fit the double cords by hooking one loop in place and then pulling the other loop over, if necessary using the special batten hook provided. Once the main battens are in place and tensioned, fit the intermediate battens by locating the pocket with the batten upside down (camber to bottom) and then rotating it over the correct way (camber to top) and sliding it fully into the pocket. Sometimes it may be easier to leave difficult battens until the cross tube tension is applied. You may then find them easier to push fully home. Attach the undersurface cords to the top surface battens using the double loop, hooking one side on first and using the tool to pull the other loop in place.
9. The undersurface battens are also cambered but the camber is reversed towards the top battens. They are inserted by lifting the trailing edge and locating the pocket, pushing the batten fully into the pocket until it locates on the front side of the leading edge. Flash 2A has a fibreglass rod batten at position 4.
10. Finally, fit the nose batten in place, locking it behind the nut and the nose plate and seal back the Velcro nose cone.
11. When all the battens are in place and tensioned, the main cross tube tension can be pulled on with the cord inside the rear fin. As the two wires are pulled back, locate the rear tang onto the location pin following with the front tang. Allow the tension cord to retract slowly and fit the pins with safety rings to prevent the tangs releasing.
12.
13. Raise the control frame by lifting the nose of the glider until the wing can be rocked back against the base bar, raising the control frame and allowing the nose wire catch to be fitted and pinned. This operation is helped by having a helper lift the keel at the rear at the same time as you lift the nose, both of you rocking the wing back over the control frame base bar. In light winds the nose can be lowered and the wing allowed to rest on the nose and control frame whilst the full pre-flight rigging check is carried out. In turbulance or strong winds it is best to have a helper hold the wings level at the nose whilst these checks are carried out.

Trike

14. Detach the transit and strut ties and roll the trike unit into position from the rear of the wing, fix the main hang bolt and back-up wire bolt, ensuring that the locking pins or rings are fitted through the bolts to prevent loss of the wing nuts.
15. Put the trike propeller horizontal(or one blade downwards for a 3-blade propeller) and lift the nose of the wing until the keel tube rests on the propeller hub. Lift the wing from the control frame base levering against the propeller hub until the folded seat of the trike unit can be locked down. This operation must be carried out with care and it helps to have a helper preventing the trike from rolling backwards, (wheel chocks are useful). Your helper can also push the trike vertical strut backwards which relieves some of the weight. Fit the front strut in place and pin the telescopic seat struts with the 'R' clips. Carry out a full pre-flight rigging check as the check list.

FUEL

After rigging the trike, fill up with the correct grade of fuel; the fuel is the life blood of the trike, treat it with respect and never fill up using dirty funnels or tubes. Do not put the petrol cap or filler cap on the floor as this can pick up dirt, and watch that dust does not fall into the fuel tank. The fuel should be filtered both when you fill up your mobile container and also as you pour it into the trike fuel tanks. A tiny partical of dirt can clog a jet and cause a serious accident. Observe strict fire precautions and do not allow anyone to smoke. Be polite at all times, but be as impolite to smoking spectators as you need to be to prevent a fire hazard. Fully inspect all fuel lines and periodically replace the fuel filter. On most models there is also a filter attached inside the fuel tank, and this too may need cleaning. Wipe down all fuel spills and fasten all containers tightly as soon as you have used them. Remove all spare fuel containers away from the immediate area and away from spectators.

FUEL TAP

A 3-way fuel tap is provided. The quick-realease fuel connectors are self-sealing. Be careful not to take off with the fuel tap closed. An extended full power check prior to take-off will ensure that the fuel system is working OK.

LOCKING NUTS

Major critical nuts are wire locked but you must always check all lock nuts to ensure they are not coming loose.

DE-RIGGING

De-rigging is an exact reversal of the rigging procedure, but great care must be taken when rolling up the sail to ensure creases are kept to a minimum. Always use the special padding pads to prevent the wing structure from damaging the sail at the control frame, trike hang block assembly and kingpost assembly. At least 4 sail ties are needed to hold a de-rigged glider firmly and these should be positioned as the rolled glider is lying on the assembled control frame. At this stage the bag can be fitted so that as the wing is rolled over to dis-assemble the frame, the bag is underneath protecting the wing and can be zipped up after the control frame has been folded. Hold the control frame with sail ties.

RIGGING AND DE-RIGGING INSPECTION

As you rig your wing you should be meticulous in your inspection of each component. This is the best time to see potential faults which may be missed when the aircraft is fully rigged.

Never allow yourself to be distracted during assembly of your aircraft and always rig to a repeatable sequence. Do not rely on the pre-flight check to find faults, but look carefully at all aspects of your aircraft as you put it together. After flight, and particularly if you have had a heavy landing or suspect damage may have occurred through ground handling or cross wind landings, you must inspect the aircraft thoroughly. Wires should be checked for damage and fatigue, tubes for bends or dents and the sail for tears or abrasions. Please check the maintenance and repair section in this manual.

NEW AIRCRAFT

ALL NEW AIRCRAFT ARE FLOWN AND SET UP BY EITHER THE FACTORY OR BY APPOINTED AGENTS. PRIOR TO DELIVERY TO THE CUSTOMER, A FULL CHECK FLIGHT IS CARRIED OUT AND ADJUSTMENTS MADE TO THE WING TO ENSURE IT FLIES HANDS OFF AT THE RIGHT SPEED AND IS PROPERLY TRIMMED OUT. OWNERS ARE DISCOURAGED FROM MAKING ANY ADJUSTMENTS AND IF YOU FEEL YOUR NEW GEMINI FLASH IS NOT PERFORMING AS IT SHOULD, IT IS ESSENTIAL THAT IT IS RETURNED TO THE FACTORY OR TO THE DEALER FOR CHECKING.

THE FOLLOWING NOTES ARE FOR GUIDANCE ONLY AND SINCE TUNING OF FLEX WINGS IS A COMPLICATED AND EXACTING SCIENCE, NO ADJUSTMENT SHOULD BE MADE WITHOUT A FULL UNDERSTANDING OF THE PRINCIPLES INVOLVED.

Wing Trim

All Mainair wings are test flown before delivery to the customer; however,all flex-wings settle down after a few hours flying and the trim of the wing may change slightly. If the trim of a wing changes,. either shown up as a change of speed, or for the wing to have a tendency to turn on one direction, check the following before jumping to any conclusions:

Make sure that the battens are in the correct side of the wing, that is battens with red plastic end caps fitted to the left-hand side of the wing, and battens fitted with green end caps to the right-hand side of the wing. During pre-delivery test flying, small adjustments may have been made to the shape of the individual battens and it is recommended that any changes from the standard shape is noted on the batten profile by drawing the actual shape of the battens in red ink on the batten profile pattern in order to record the changes from standard. It is for this reason that it is imperative that battens are installed on the correct side of the wing.

Any changes in the trim or handling characteristics of a wing due to settling down should be only very slight and occur gradually over a period of time. If a wing which has been flying correctly suddenly developes a turn or changes its trim speed, it is most likely that some damage has occurred. It may be nothing more than the shape of the battens having been changed in transit, so first check the battens against the batten profile. If a wing is damaged, it should be returned to the factory or the nearest dealer for safety checks before it is flown again.

Having carried out the checks above, if it is found necessary to adjust the trim speed of the wing, proceed as follows:

Refer to page 29. The position of the hang point on the keel can be adjusted by moving it towards the front of the keel to increase the speed and towards the aft of the keel to reduce the trim speed. The adjustment is made by removing the hexagon socket bolt with the 5mm key which will be found in the wing tool pocket in the batten bag. Remove the bolt and move the hang block to the new position; relocate the bolt - DO NOT OVERTIGHTEN. You should aim for a hands-off trim speed of approximately 50-55 mph indicated.

If the required trim speed can not be achieved by adjusting the hang point alone, then adjustments can be made to the leech line settings. Proceed as follows: Refer to pages 28 and 30 being careful to use the correct adjustments for a Flash I, Flash II, or Flash II Alpha.

IMPORTANT: ADJUST ONLY ONE LEECH LINE AT A TIME MOVING IT ONLY ONE HOLE AT A TIME ON THE ADJUSTER AND CHECK FLIGHT THE AIRCRAFT FOLLOWING EACH ADJUSTMENT.

First adjust the inboard leech line moving it up to reduce speed and down to increase speed on the adjuster. If the desired trim speed can not be achieved after moving the inboard leech line two holes, then the next adjustment should be to move the intermediate leech lines in the appropriate direction, namely, up to reduce speed and down to increase speed.

The foregoing should provide adequate adjustment to bring the aircraft to the desired trim speed. If, after these adjustments, the wing is flying too slow, check that the cords holding the battens in place are tight, particularly the cords pulling back the undersurface near the tip in the case of a Flash II or a Flash II Alpha. The cord should be so tight as to require levering into position using the batten cord rigging tool supplied with the wing tool kit.

If the foregoing does not achieve the desired trim speed of approximately 50 to 55 mph, adjust nothing else but contact your nearest Mainair dealer.

Adjustments to correct for inherent turn

All new Mainair aircraft are check flown and adjusted by the dealer, and should fly straight in cruising flight mode.

Note: It is normal for your aircraft to have a very slight turn when operating at very high power settings due to propeller torque reaction.

After a settling in period of several hours flying, your wing may develop a tendency to turn slightly in one direction or the other, and while this is in no way dangerous, it can be a nuisance on long, cross country flights, rather like driving a car with incorrectly balanced tyre pressures.

To adjust the wing to correct for inherent turns, proceed as follows:

First check the battens against the batten profile - bearing in mind that during the initial flight test small adjustments may have been made to the batten profile and these should be noted on the batten profile pattern.

Next, if your wing is fitted with button pin index adjustments, check that the button pin is properly located in the neutral position (marked N) on both wing tips.

Next, if there is the slightest possibility that the wing has been damaged, a full airframe check must be carried out, paying particular attention to make sure that the leading edges are straight when they are de-rigged and relaxed.

Having carried out the above checks and the wing is still turning, for example, to the right, then an adjustment can be made to the left-hand button pin index adjuster. To carry out this adjustment, the wing should be de-rigged so that the sail tension is relaxed, the spring button pin can now be depressed and the wing tip rotated to the next hole in the UP position, that is the direction which will lift the trailing edge on the wing which is being adjusted. IT IS IMPORTANT THAT THE ADJUSTMENT IS MADE ONE HOLE AT A TIME AND THEN A CHECK FLIGHT CARRIED OUT BEFORE FURTHER ADJUSTMENTS.

For a left-hand turn, the adjustment should be made by moving the right-hand wing index up one hole.

If the foregoing does not correct the problem, contact your nearest Mainair dealer.

RUNNING IN AND STARTING UP

RUNNING IN ON ROTAX ENGINES

The Rotax engine has a detailed running in schedule in the engine manual which allows you to run the engine in over a very short time. Secure the trike safely since it is necessary to have the propellor fitted during all running in. Follow the suggested running in times precisely.

STARTING UP

A trike is a lethal machine. A spinning propeller can be all but invisible and there have been countless accidents; don't think it cannot happen to you! Locate the front wheel against something immoveable such as a wall, being aware that as soon as the engine starts there is propulsion and the trike will want to move. Clear all spectators away, particularly away from the area which would be affected by a fractured propeller. In practice, this means that everyone should be in front of the trike, but well clear at each side. Select a member of your crew to keep people away - as they tend to drift closer and you may be too busy to notice them. Check to make sure there is nothing that could be sucked into the propeller, such as seat belts, scarves, cleaning cloths, maps, clothing, etc., etc. Switch on the fuel and seat yourself in the trike. Open the hand throttle about 1/8 and select around half choke. These amounts will vary with the machine and you will need to experiment a little. BE AWARE OF THE DANGER OF STARTING UP WITH THE HAND THROTTLE OPEN TOO FAR.

Switch on the ignition, calling loudly "Switches on". Get hold of the pull start or electric ignition switch, and before turning the engine at all, look around and shout "Clear prop". Do not feel embarrassed or self-conscious, you are starting an aeroplane and it's a serious business. Calling these warnings should be a habit. If all is clear, start up. Continue to check for drifting spectators and run the engine until it is warm and runs smoothly without choke. If the engine does not start after a few pulls, it's likely to be flooded and it will be necessary to remove the plugs, clean and dry them, and start again.

Engines fitted with Ducati Dual Electronic Ignition

Aircraft fitted with this system are easily identified by two ignition switches mounted on the right hand side of the seat frame.

Engine starting procedure is exactly the same as earlier Rotax engines fitted with contact breakers: namely by priming the engine and applying the appropriate amount of choke, setting the throttle approximately 1/8 open, switching on both ignition switches on the right-hand seat frame (exactly where they were on earlier engines) and operating the pull start. Once the engine is running, ensure that the choke level is fully closed after a short warm-up period.

After allowing at least two minutes warm-up period with the choke fully closed, set the hand throttle having checked that the aircraft is safety restrained to give an RPM reading of 3,000. Having allowed a period for the engine to stabilize, switch off one of the ignition switches. You should notice a change in the engine note and observe a drop in RPM. This should normally be about 50 RPM drop, but under no circumstances should exceed 300 RPM drop. Provided this check is satisfactory, switch on both ignition switches again, and then switch off the other ignition switch. The same drop in RPM should be noted on both ignition systems.

This MAG DROP CHECK should be carried out before each and every flight. The aircraft must not be flown if either of the ignition systems is found to be unsatisfactory.

WE RECOMMEND THAT REPAIRS OR REPLACEMENT OF PRIMARY AND SECONDARY COMPONENTS IS CARRIED OUT AT AN APPROVED MICROLIGHT FACILITY.

The essence of enjoyable triking is maintenance. Launching and landing in fields and open spaces, which are often bumpy and rough, subject both your trike and glider to the most appalling loads, and it is inevitable that things will go wrong. Vibration caused by the 2-stroke engine can fracture components and vigilant inspection is essential. Every flight should be preceeded by a full pre-flight check and any noticable failures or potential failures should be rectified before flight.

It is essential to grease all three wheels and to keep the tyres correctly inflated. The control cables should be graphited occasionally, but removing all accumulated dust from them is essential. As they operate, they wear out and this dust will one day jam them unless they are kept clean. A frequent strip down to inspect the nipples and joints is good practice.

You must pay particular attention to the exhaust system and its mountings. Frequently inspect for stress induced fractures and have these repaired as soon as they become evident. Carefully check the rubber mountings and replace any that show signs of fatigue.

Inspect all rubber engine mountings and the whole engine mounting assembly on a daily basis. Get used to frequently going over the whole trike checking cables for stretch and elongation, aluminium plates and channels for worn holes and loose fitting bolts, and the general integrity of the trike structure itself. Also keep an eye on such obvious things as the seat and harness straps.

Ensure that the fuel tank is strapped tightly in place at all times, and inspect to ensure that no chaffing is taking place. Inspect and frequently clean out or replace the fuel line filters and in addition, wash out the air filters from time to time. Ensure that all cable runs are straight and free from damage and carefully inspect the electrical ignition system.

Remember, preventative maintenance is the only way to trouble free and pleasurable trike flying. Please refer to maintenance schedules.

PROPELLER CARE - See also page 17 - 3 Blade option.

Wooden propellers need careful handling if they are to perform well for you. Avoid using your trike on dusty, stoney ground, or anywhere where abrasive materials are sucked through the prop. The leading edges of the propeller can be protected with high-impact helicoptor rotor tape. If this eventually shows signs of looseness it should be replaced. It has been proved that wooden propellers go out of balance with time. Moisture absorbtion is the problem, and it can be reduced by thoughtful handling. Always store the trike unit with the blade in the horizontal position in a warm dry place and maintain the high quality varnish finish. Frequently

CONT :—

PROPELLER CARE CONTINUED

check and rebalance the propeller if required. There are many publications and articles available on propeller maintenance. You are advised to locate and read them.

FUEL SYSTEM - see drawing ON PAGE Nº 27

ELECTRICAL SYSTEM - see drawing ON PAGE Nº 26

SPARE PARTS ORDERING - Please order by quoting reference number in illustrated parts catalogue, giving full part description and trike or wing serial number

MAINTENANCE AND REPAIR

WARNING - THE FLASH WING AIRFRAME IF DECEPTIVELY SIMPLE, BUT LIKE ALL AIRCRAFT REQUIRES SKILLED AND QUALIFIED ATTENTION. WE DO NOT RECOMMEND SELF REPAIR OR RE-ASSEMBLY BY OTHER THAN FACTORY NOMINATED REPAIR AGENTS. NO REPLACEMENT PARTS SHOULD BE FITTED UNLESS THEY ARE FACTORY SUPPLIED AND IDENTIFIED SINCE THE WHOLE WING STRUCTURE IS CLASSIFIED AS PRIMARY STRUCTURE.

FABRIC

Care and maintenance starts the very moment you take delivery of your wing. 50% of all damage and degredation of your wing will take place when it is being stored or transported. Packing away properly is the most important single thing you can do to extend the life, efficiency and safety of this fragile piece of high technology. Dumping it in the bag with a few ties round it is the fastest way to rub holes in the sail, abrade rigging cable and dent tube. Despite the best care you can take, you will still have accidents with the odd wall or wire fence or your protection pads may slip and you will be faced with slight damage to the fabric. Where this takes place depends on how it can be repaired, high load areas such as a trailing edge being critical. Any cuts or tears through the trailing edge, sail fixing points or similar high load areas must be repaired at an approved workshop. Small damage to panels, leading edge cover etc can be repaired with self adhesive tape which is cut to size, pressed into place on the dry clean sail and warmed gently with a hair dryer to melt the adhesive, being careful not to apply too much heat. We define small damage as abraded holes no more than 15mm dia and small cuts no longer than 20mm. Anything larger should be inspected by a qualified engineer.

STITCHING DAMAGE

All the seams are firstly joined with a double sided sail adhesive tape and then double zig zag sewn. Thread damage never ever gets better and eventually runs. Since the wing is held together with stitches, its pretty obvious what will happen when the stitching fails. If you abrade a seam, then have the damage repaired before it gets worse. Small non loaded areas can often be repaired in-situ by the tedious but effective method of hand sewing back through the original stitch holes. Never use anything but matching polyester thread which is available from Mainair Sports or any good workshop or sail makers.

CLEANING

The best answer to dirty sails is to keep them clean, but if all else fails and you need to wash your wing, then select a dry day and have access to a good hose and clean water supply. Never use strong soaps or detergents since soap residue can re-act with ultra violet light and degrade your fabric. We recommend a very mild liquid soap (washing up liquid) and a soft sponge. Gently wash the fully rigged wing, frequently hosing clean. Copious amounts of clean water will not harm the wing and can be very beneficial in removing sand and grit which may get trapped inside the leading adge pocket usually in the nose or wing tip areas. Ensure the wing is completely dry before de-rigging.

ULTRAVIOLET DEGREDATION.

The sail is made from 100% Polyester fabric which, like all similar materials, is subject to degredation caused by exposure to sunlight. The fabric is treated with a special UV resister and in normal use the sunlight has little effect even over many years. Extreme conditions can have a disasterous effect. Leaving your aircraft rigged in, say, hot desert conditions for 6 months or so will result in complete breakdown of the fabric. Never leave your aircraft in sunlight for longer than is necessary, and check the condition of the mostly effected top surface against the protected under surface at intervals.

TUBES

The rules applied to the fabric also apply to the aluminium airframe. Care and consideration in de-rigging and transportation will pay huge dividends in airframe life. Any damage to one of the structural members is serious and can usually only be repaired by replacement. Tubes suffer from abrasion or indentation the first accelerating fatigue fracture and the second reducing the strength of the part by a massive amount. If you bend, dent or damage the tubular members in any way, seek immediate professional advice before flying again and have replacement parts fitted.

BOLTS and NUTS

All the bolts are AN series airframe bolts and only these type should be used for replacement. Any bolt which is bent or showing signs of corrosion should be immediately replaced. Nyloc nuts should only be used once and wire locked nuts must be re-locked in place.

RIGGING WIRES

The main danger with the rigging lies in kinking the wire, again caused by bad de-rigging. Once a wire has a kink, the strands are damaged and replacement is the only cure. The side wires are particularly important and should receive a frequent detailed inspection. Check for wire damage along the length but the main failure area lies immediately adjacent to the swaged fitting. Look carefully for signs of strand fracture at this position. Corrosion is a serious problem particularly in coastal areas and shows itself as a white powdery deposit. Corrosion cannot be cured and replacement is the only answer.

FITTINGS

Most fittings on the Gemini Flash are manufactured from aluminium alloy and then anodised. damage can occur through scratching or by the stress of an unduly heavy landing or crash, or by general wear. Look for elongated holes and stress lines on the aluminium. Damaged items should be replaced.

BATTENS

Battens form the wing shape and hence dictate the whole performance of the wing. They need treating with care, and since they are subject to constant tension both during flight and rigging, tend to lose their shape and flatten out. It is essential that they are reformed at frequent intervals and checked against the template. The best way to reform is to hold the batten against your knee and, whilst applying pressure to bow the batten, slide it side to side over the area you want to bend. Direct point bending will usually result in either a poor shape or a broken batten.

Refer to trimming notes.

CARE and CLEANING

Microlights operate from fields, beaches etc, and are submit to contamination from salt and water on beaches and mud and manure on fields. We recommend that your machine is cleaned thoroughly after every day's use, particularly if used on the beach or near salt water conditions.

SALT WATER OR BEACH CONDITIONS

After each day it is essential that you hose off your machine completely with fresh, clean water. Pay particular attention to areas where sand can lodge such as between the axle plates and under small brackets and fittings. It is important to ensure that all tubes are plugged to prevent the ingress of salt water, but if you suspect that this may have happened, it is essential to remove these plugs and wash out any contamination. Salt water will corrode aluminium at an alarming rate.

WHEELS

If the wheel bearing has been immersed in salt water it will be necessary to remove the wheel, clean away the old lubricant and re-lubricate.

FIELDS

Mud and manure must be hosed off as soon as possible, since not only can it hide defects, but it can also contain corroding eliments. A strong hose down with clean water is recommended, again paying particular attention to areas between plates and fittings.

BATTEN END FINGERS

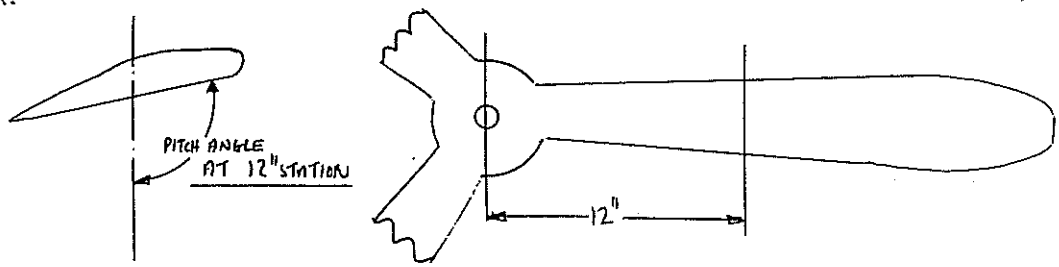
Continual rigging and de-rigging may lead to the white nylon batten end finger wearing to a very sharp edge. Please note that this may cut through the sail stitching in the batten pocket and from time to time the sharp edge should be filed off to a smooth radius.

3 BLADED PROPELLORS. (WOODEN)

The 3 bladed propellor option for our aircraft offers a reduced vibration, better economy and improved performance. Care and maintanence is exactly the same as for the standard wooden 2 blade propellors. Keep the unit in balance, use leading edge tape for protection and store carefully.

BLADE ADJUSTMENT.

Each blade is ground adjustable and is infinitely variable. It is held in a nylon saddle arrangement and secured with 6 bolts. These bolts must be tightened evenly and checked from time to time. About 14 ft/lbs is a reasonable torque setting but wood expands and contracts with moisture and it is wise to check these bolts frequently.
Adjusting pitch is acheived by rotating the blade and checking the angle very carefully. Quarter of a degree will make a 100 - 200 rpm difference so as you can see it is very critical.We have standardised on a position along the blade 12" from the hub centre and use the Mainair propellor setting jig and protractor to check the angle. This angle is critical for the behaviour of the propellor and to meet the noise requirements for the U.K.



3 Blade Ground Adjustable (Wood)
Rotax 503 : 62" diameter 107deg at 12" Pitch
Rotax 462 : 62" diameter 107deg at 12" Pitch
Rotax 582 : 62" diameter 112deg at 12" Pitch
All the above engines with 2.58/1 reduction.

This position is also best to give all round economy and performance. DO NOT SET THE PROPELLOR AT A DIFFERENT PITCH OR YOU WILL INVALIDATE YOUR PERMIT TO FLY AND NOISE TYPE CERTIFICATE.

OPERATION OVERSEAS (Applicable to foreign registered aircraft only. Aircraft registered in UK must comply with pitch settings given above when operating overseas)
Varying climatic conditions or altitude operation may benefit from adjusting the propellor to a different setting from that above. The finer the pitch, the faster the engine will be able to turn the propellor and in general the more thrust will be developed.However,the noise level will increase and the fuel consumption increase. You must be careful to match the pitch to the engine RPM such that it is impossible to exceed the engine limiting speed as detailed in the manual even at VNE. Increasing pitch will tend to reduce thrust but will not necessarily improve fuel consumption. In addition, too much pitch may cause overheating and damage. If the engine speed is held down such that it cannot develop its full potential, the power produced will be low and the propellor will prevent the tuned exhaust system functioning properly, leading to speed fluctuation.

METHOD FOR PITCH SETTING

Start with two blades tightened and slacken all 6 bolts on the blade to be adjusted, which should be vertical. Grasp the blade and flex it carefully backwards and forwards with one hand applying a twisting force near the hub with the other hand. If you find you cannot adjust it, you can slacken off the bolts of the adjacent blades. Continually check with the setting jig and protractor. When satisfied it is correct, tighten up all 6 bolts and re-check. Repeat as required. Remember , it is most important to set all 3 blades at exactly the samepitch angle. If the nyloc nuts loose their locking ability from repeated assembly and dis-assembly they should be replaced.

3 BLADED WD (COMPOSITE) PROPELLER

The 3 bladed WD propeller option offers an even greater reduction in vibration and a more trouble free life. Care and maintenance is reduced to checking the blade for any chips or damage, wiping dirt from the blade with a damp cloth, and if any vibration is present, to checking the blade pitch.

If the tips are to be painted to increase visibility, then a laquer based, or enamel based paint should be used, NOT A CELLULOSE BASED PAINT. Once the tips have been painted then the propeller should be checked for balance in the same was as a wooden propeller, however any out of balance can only be corrected by the further application, or removal, of paint.

The composite propeller should provide greater resistance to abrasion from dust, sand and rain, and should not require the protection of propeller tape.

The pitch setting procedure is exactly the same as for the wooden propeller, except that there are just four clamping bolts per blade. In addition, prior to tightening each blade ensure that it is pulled outwards firmly against the clamping block. The clamping bolts should be torqued to 9 to 10 ft.pounds, and the six mounting bolts should be torqued to 12.5 ft.pounds. The gap between the clamping blocks can be narrower at the tip than at the root end of the block.

The correct blade setting is as follows:

3 Blade WD Ground Adjustable
Rotax 503 : 62" diameter 113deg at 12" Pitch
Rotax 462 : 62" diameter 113deg at 12" Pitch
Rotax 582 : 62" diameter 116deg at 12" Pitch
All the above engines with 2.58/1 reduction.

4 Blade WD Ground Adjustable
Rotax 582 : 62" diameter 125deg at 12" Pitch
All the above engines with 3.47/1 reduction.

Engine Rotax 503 — 3 Blade 62" dia. Pitch Angle 113 deg. At 12 inches from hub centre.

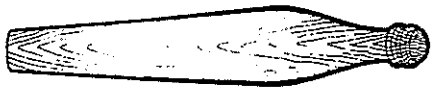
All blades must be set at exactly the same pitch settings otherwise vibration will occure resulting in a reduced aircraft life from fatigue. A small pen mark at the blade root can be used to determine if there has been any blade creep. Where a range of pitch settings are available the lower pitch setting gives the best take-off and climb performance, where as the higher pitch setting limit gives the best cruise economy. The engine should not be run-in on the coarse pitch setting due to the limited maximum rpm whilst stationary. When operating at low all up weights care should be taken to keep within the pitch up limits of the aircraft (see page 8).

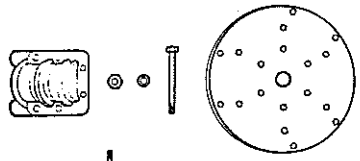
DO NOT SET THE PROPELLER AT A DIFFERENT PITCH SETTING TO THE ABOVE LIMITS OR YOU WILL INVALIDATE YOUR PERMIT TO FLY AND NOISE TYPE CERTIFICATE.

Assembly Instructions for your Adjustable Pitch Propeller

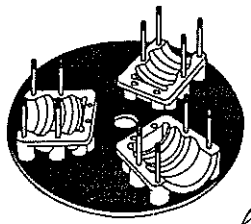
First, let's check and see if we have all the parts

1. Propeller Blades ... 3
2. Nylon Retainers ..... 2 for each blade
3. Aluminum Plates ..... 2 for each prop assy.
4. Bolts with flat washer and safety nut ..... 4 for each blade





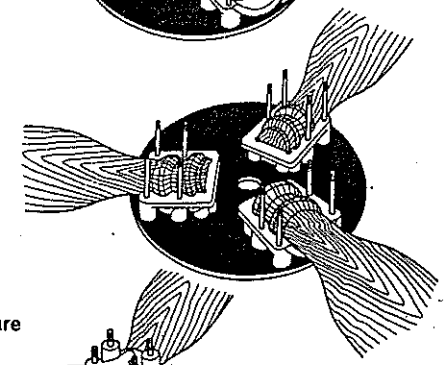
Pick up one of the aluminum plates. You will notice that one side looks as though it has been machined and is much more pleasant to look at. This is the side of both plates that you want showing on the outside of your assembled prop. First, insert all 12 bolts through the plate from the "Pretty side." Leave the 6 center holes empty. Lay the plate down on a flat surface with the bolt ends (threads) sticking up. Take one of the nylon retainers and with the cupped side up and the open end facing outward, press it down onto one of the groups of 4 bolts. Now do the same for the other two retainers.



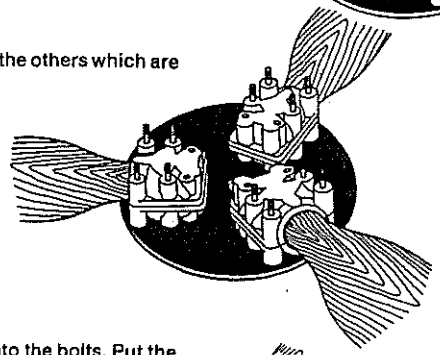
Next lay the butt ends of the prop blades down in the retainers.

Note.

lay the blades down with the flat side up.

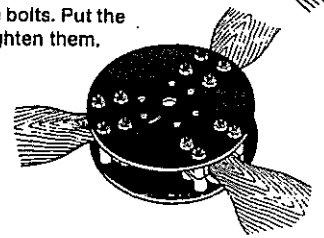


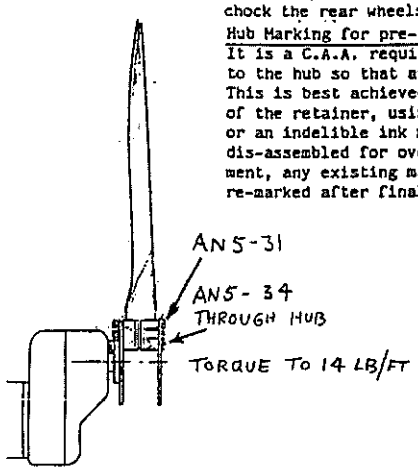
Press the remaining 3 retainer cups down onto the others which are holding the blades.



With the pretty side up, press the other plate onto the bolts. Put the washers and then the nuts on the bolts and finger tighten them.

After adjusting the pitch, tighten the nuts





Blade Adjustment

Each blade is ground adjustable and is infinitely variable. It is held in a nylon saddle and secured with 6 bolts which must be tightened evenly and checked from time to time. The bolts should be torqued to 14 ft/lbs.

To adjust the pitch slacken all 6 bolts on the blade to be adjusted which should be vertical. Grasp the blade and flex it carefully backwards and forwards with one hand applying a twisting force near the hub with the other. Continually check with the setting jig and protractor and when satisfied it is correct, tighten up all 6 bolts and recheck. Repeat as required. Remember, it is important to set the blades at exactly the same pitch angle. 1° will make a 100-200 rpm difference, so you can see it is very critical.

The Mainair propeller setting jig and protractor is the tool which should be used, and we have standardised on a position 12" from the centre of the hub. If the nyloc nuts lose their locking ability from repeated assembly and disassembly they should be replaced.

Section 'S' approval

We have CAA approval for use of a 3-blade propeller on Gemini Flash 462 and 503 engines. Please refer to the pilot manual before assembly or operation.

Propellor Balancing.

Multi blade propellors are best balanced on a suspension balancing tool. This accessory is available from Mainair Sports.

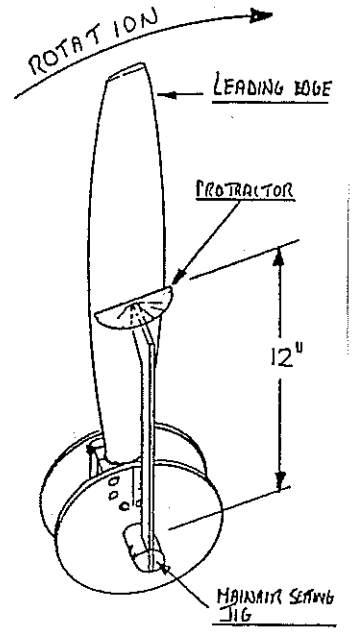
Rigging Aircraft:

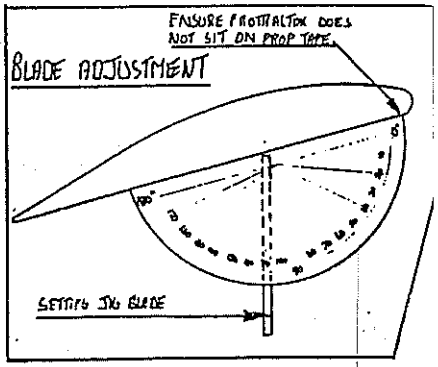
The greater hub diameter necessitates a different rigging technique. Firstly set the propellor one blade down whilst lifting the nose of the wing and rolling the trike unit backwards. Before completing the lift, the wing keel should be moved over to one side rotating the propellor one blade vertical and alongside the fin. This allows the wing keel to drop down the side of the hub giving the necessary clearance between the control frame and cockpit nose. Take care whilst lifting not to damage the blade on the wing trailing edge during rigging and de-rigging. The wing keel must also be protected from damage by fitting a protection pad to the hub whilst rigging.

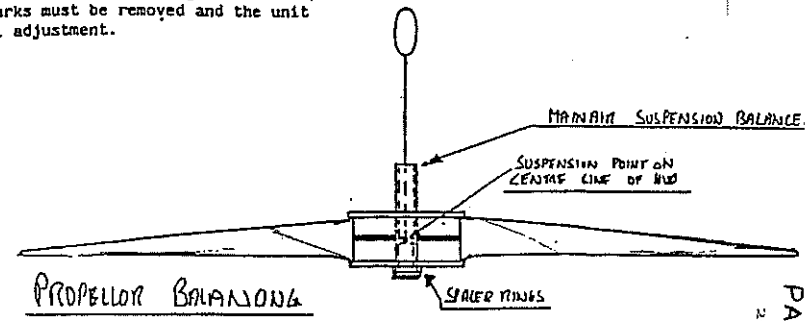
Wherever possible use a helper when rigging and always chock the rear wheels.

Hub Marking for pre-flight Inspection

It is a C.A.A. requirement that each blade be marked next to the hub so that any slippage can be easily identified. This is best achieved by marking between the split line of the retainer, using either a fine paint brush and paint or an indelible ink marker. Whenever the propeller is dis-assembled for overhaul, re-varnishing or blade replacement, any existing marks must be removed and the unit re-marked after final adjustment.







AIRFRAME LIFE AND MAINTENANCE SCHEDULE

The whole concept of the flex wing microlight revolves around the ability of the wing to distort and change shape to accommodate the flight loads and to be controllable in flight. The airframe is designed to be non-rigid, and designed strongly enough to be able to flex in this way for the lifetime of the aircraft. However, "lifetime" is very subjective and is being constantly extended as microlight development catches up with materials and operational limitations. Not very long ago "lifetime" was often under 100 hours, whereas today 300-hour airframes can easily be found. Very few aircraft have over 500 hours, but they are around. No doubt in 2 years we will know of airframes with over 1,000 hours, but the reality of today is that, despite tests, experience and calculation, no-one quite knows how well the various components will stand up to the constant flexure, vibration and atmospheric corrosion the airframe is subjected to throughout its life. Constant cyclic loading causes fatigue, and fatigue shows itself as hairline cracks and fractures. Fatigue can be greatly accelerated by vibration which can result from poor propeller balance, or by poor flying techniques.

As a result the following table is advisory only and based upon calculation and experience.

MAINTENANCE SCHEDULE

The X hours are for private owner operation only. Training and commercially operated aircraft must follow the 0 hours.

Note

A full visual inspection must be carried out each time you rig and de-rig. Additional full checks must be carried out at any time you suspect damage may have occured ie heavy landings, transit damage etc.

Key - see maintenance and repair section of this manual.

Inspection - visually inspect, checking for loose fittings, hole elongation etc.

Major Inspection - strip part and inspect all fittings and bolts. Replace bolts as required. Test for fatigue cracks at suspect areas. Do not re-use nyloc nuts.

Replace - mandatory life of component. Wear or damage may dictate earlier replacement.

Hours - means designated work should be carried out at each period.

WING		EVERY → 10 HRS	50 HRS	100 HRS	250 HRS	500 HRS	1000 HRS	As reqd.
Battens	- check shape	X						
Keel	- inspection	X						
	- major inspection			X				
	- replace				0 = 400hrs	X		
Leading Edges	- inspection	X						
	- major inspection				X			
	- replace					0 = 750hrs	X	
Cross Tubes	- inspection	X						
	- major inspection				X			
	- replace						X	
Control Frame Tubes	- inspection	X						
	- major inspection				X			
	- replace						X	
Fin Tube	- inspection	X						
	- major inspection				X			
	- replace							X
Tip Struts	- inspection	X						
	- major inspection				X			
	- replace							X
Trike Hang Strap	- inspection	X						
	- replace				X			
Trike Hang Bolts	- replacement			X				
Cross Tube Leading Edge Pivot Bolt	- replacement			X				
Cross Tube Hinge Bolt	- replacement			X				
All Bolts, Pins & Fixings.	- replacement							X
Side Rigging Lower Wires.	- inspection	X						
	- replace				X			
Front Rear Rigging Wire	- inspection	X						
	- replace							X
Cross Tube Tension Rigging	- inspection	X						
	- replace				X			
King Post Rigging	- inspection	X						
	- replace							X
Leech Line Rigging	- inspection	X						
	- replace							X
TRIKES								
Wheels	- inspection	X						
	- major inspection			X				
	- replace bearings							X
	- replace tyres & tubes							X
Front Fork	- inspection	X						
	- grease	X						
Throttle Assembly	- inspection	X						
	- clean & lubricate	X						

		EVERY - 10 HRS	50 HRS	100 HRS	250 HRS	500 HRS	1000 HRS	As reqd.
TRIKES CONTINUED								
Engine Control Cables	- inspection	X						
	- clean & lubricate	X						
	- replace							X
Carburettor Air & Fuel Filters	- inspection	X						
	- clean	X						
	- replace							X
Fuel Hose	- replace							X
Rotax Gearbox	- lubricate hub	X						
	- change gearbox oil		X					
	- inspect magnetic plug		X					
	- check bolt tension	X						
	- inspection	X						
	- major inspection			X				
Propeller	- inspection	X						
	- revarnish & rebalance							X
Exhaust	- inspection	X						
	- replace							X
Spark Plugs	- replace every 25 hours maximum							
Ingnition Switch	- replace			X				
Axle Tie Wire	- replace				X			
Rubber Mounts	- replace							X
Telescopic Side Struts	- major inspection		X					
	- re-lubricate or renew							X
Airframe Tubes	- inspection	X						
	- major inspection				X			
	- replace							X
Trike Monopole	- replace				O=300hrs	X		
Trike Keel	- replace					X		
Airframe Bolts	- inspection	X						
	- replace							X
Carburettor Bowls	- clean	X						
Carburettor	- major inspection			X				
Engine Performance Static Thrust Check	- carry out whenever engine is below par or every 200 hours.							

FUEL LINE NOTE

The fuel line is a special fire restistant type and must be obtained directly from Mainair Sports Ltd. No replacement fuel line must be used unless it is factory approved.

PROPELLER HUB BOLT

Frequent removal of the propeller for maintenance may lead to wear elongation of the bolt fixing holes. Care must be taken to avoid this by always fitting the propeller and disc in the same position and carefully fitting the bolts in place. Always inspect for bolt fit prior to refitting since significant elongation of these holes may lead to propeller bolt failure.

RECORD OF RUNNING HOURS

Date	Hours	Total

Date	Hours	Total

Date	Hours	Total

Date	Hours	Details	Carried out by

ANNUAL AIRWORTHINESS INSPECTION

Date	company	Comments	Signed

OWNER LIST

1 Date of purchase Name Address	3 Date of purchase Name Address	5 Date of purchase Name Address
2 Date of purchase Name Address	4 Date of purchase Name Address	6 Date of purchase Name Address

MAINTENANCE RECORD

Date	Check Hours	Carried out by	Comments	Signed

ACCIDENT/INCIDENT REPAIR LOG

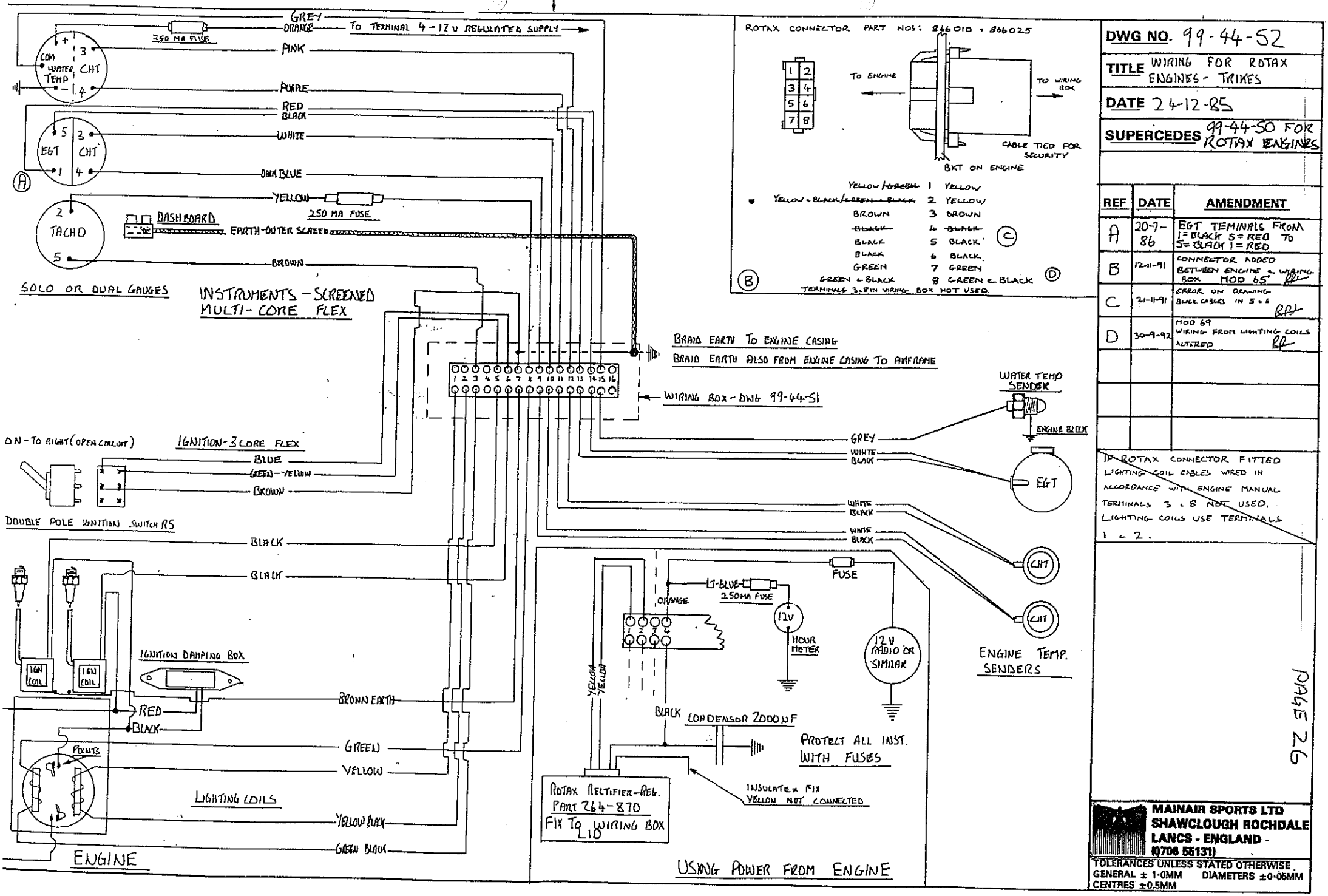
Date	Damage details	Repair action	Signed

MAINTENANCE RECORD

Date	Check Hours	Carried out by	Comments	Signed

ACCIDENT/INCIDENT REPAIR LOG

Date	Damage details	Repair action	Signed



DWG NO. 99-44-52

TITLE WIRING FOR ROTAX ENGINES - TRIKES

DATE 24-12-85

SUPERCEDES 99-44-50 FOR ROTAX ENGINES

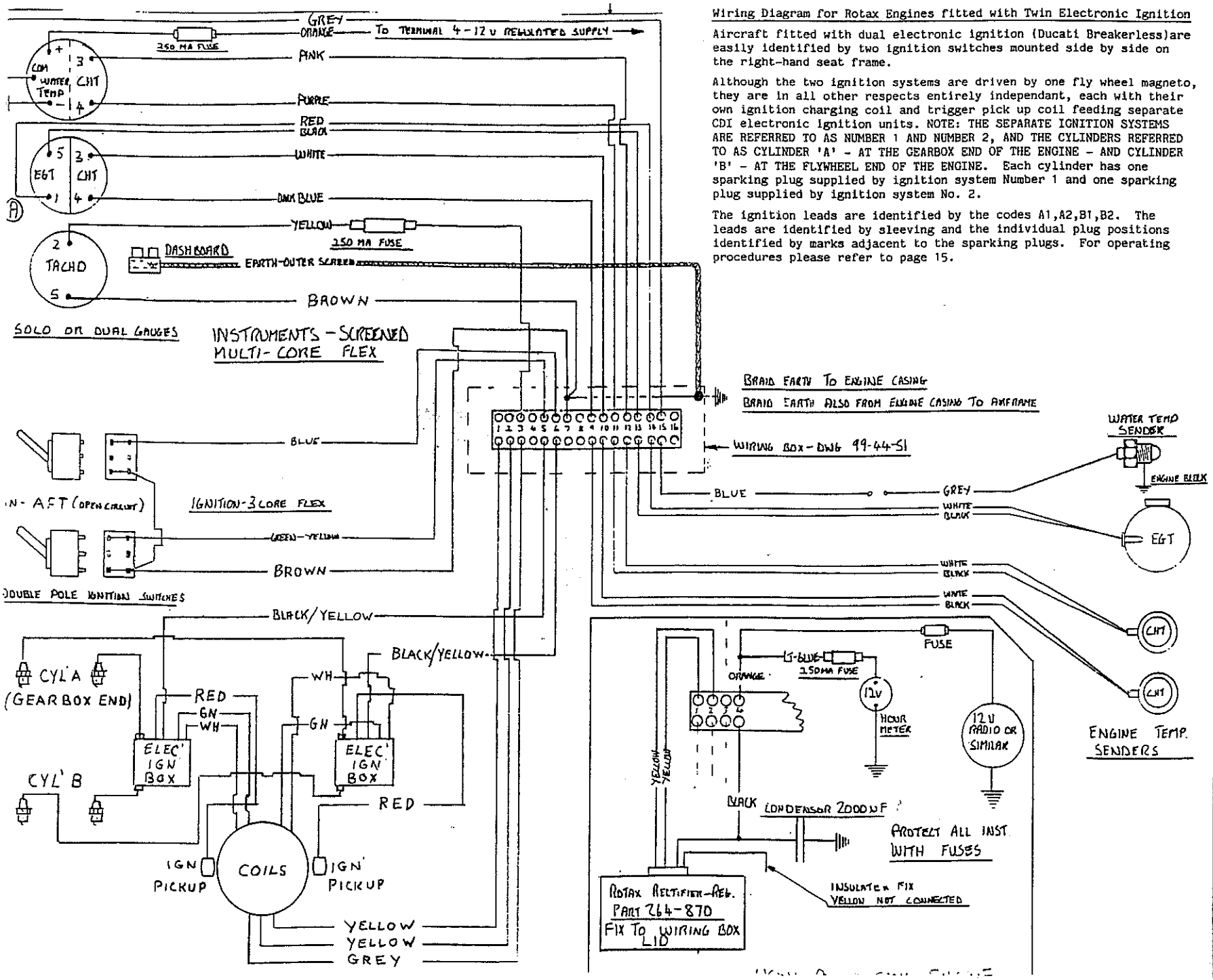
REF	DATE	AMENDMENT
A	20-7-86	EGT TEMINALS FROM 1 = BLACK 5 = RED TO 5 = BLACK 1 = RED
B	12-11-91	CONNECTOR ADDED BETWEEN ENGINE & WIRING BOX MOD 65 RPF
C	21-11-91	ERROR ON DRAWING BLACK CABLES IN 5 & 6 RPF
D	30-9-92	MOD 69 WIRING FROM LIGHTING COILS ALTERED RPF

IF ROTAX CONNECTOR FITTED LIGHTING COIL CABLES WIRED IN ACCORDANCE WITH ENGINE MANUAL TERMINALS 3 & 8 NOT USED. LIGHTING COILS USE TERMINALS 1 & 2.

PAGE 26

MAINAIR SPORTS LTD
SHAWCLOUGH ROCHDALE
LANCS - ENGLAND -
(0706 55131)

TOLERANCES UNLESS STATED OTHERWISE
GENERAL ± 1·0MM DIAMETERS ±0·05MM
CENTRES ±0.5MM



Wiring Diagram for Rotax Engines fitted with Twin Electronic Ignition

Aircraft fitted with dual electronic ignition (Ducati Breakerless)are easily identified by two ignition switches mounted side by side on the right-hand seat frame.

Although the two ignition systems are driven by one fly wheel magneto, they are in all other respects entirely independant, each with their own ignition charging coil and trigger pick up coil feeding separate CDI electronic ignition units. NOTE: THE SEPARATE IGNITION SYSTEMS ARE REFERRED TO AS NUMBER 1 AND NUMBER 2, AND THE CYLINDERS REFERRED TO AS CYLINDER 'A' - AT THE GEARBOX END OF THE ENGINE - AND CYLINDER 'B' - AT THE FLYWHEEL END OF THE ENGINE. Each cylinder has one sparking plug supplied by ignition system Number 1 and one sparking plug supplied by ignition system No. 2.

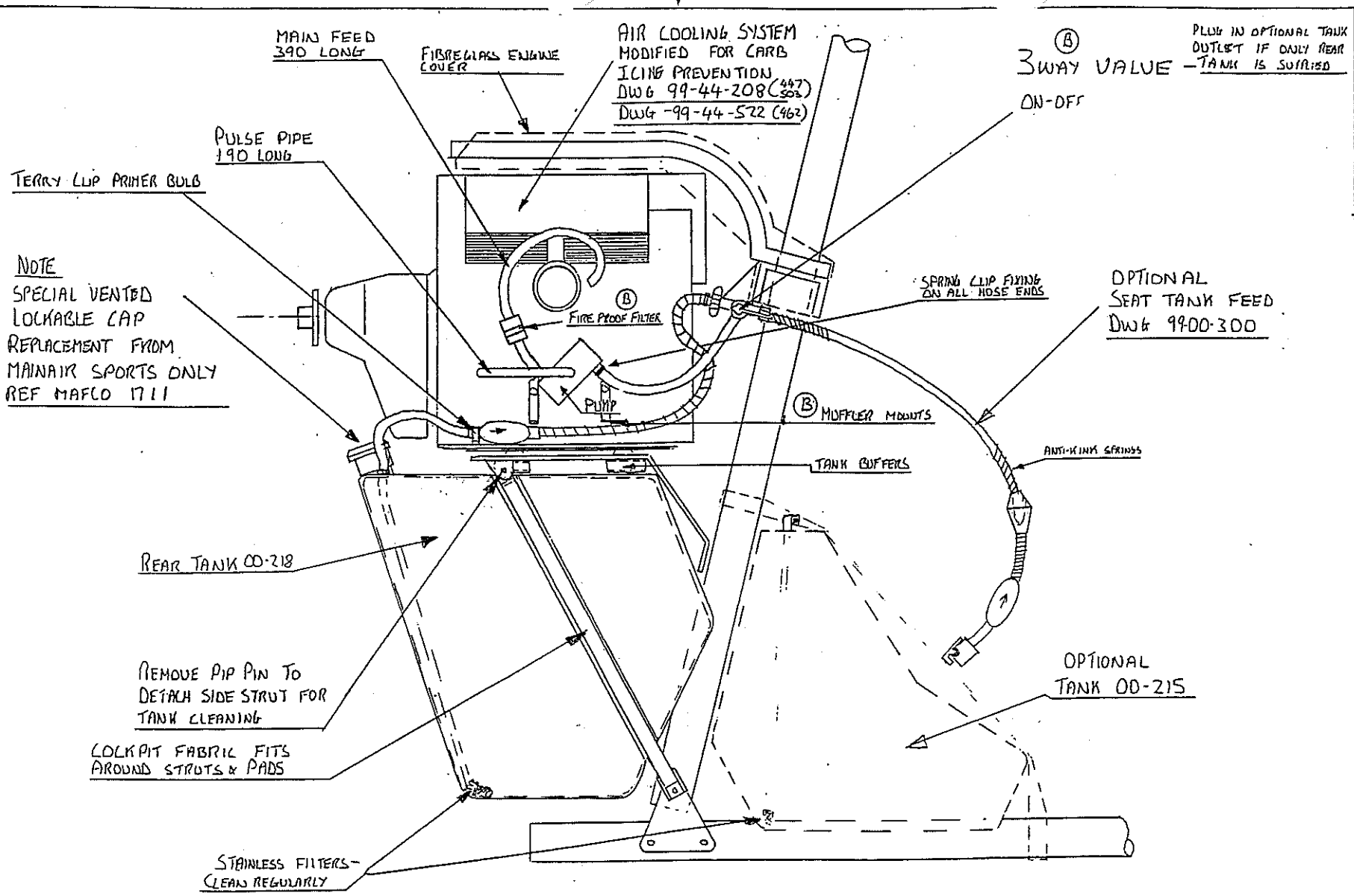
The ignition leads are identified by the codes A1,A2,B1,B2. The leads are identified by sleeving and the individual plug positions identified by marks adjacent to the sparking plugs. For operating procedures please refer to page 15.

DWG NO.	99-44-53
TITLE	Wiring for TWIN Electronic IGN ROTAX.
DATE	
SUPERCEDES	
DRAWN BY:	BK

REF	DATE	AMENDMENT

MAINAIR SPORTS LTD
TEL: 0708 55134

TOLERANCES UNLESS STATED OTHERWISE
GENERAL ± 1·0MM DIAMETERS ±0·05MM
CENTRES ±0.5MM



ALL FUEL LINE HOSE FIRE RESISTANT TYPE B-1/4"
REPLACEMENT FROM MAINAIR SPORTS ONLY

DWG NO. 99-00-303

TITLE UPRIGHT ROTAX FUEL TANK LAYOUT

DATE JANUARY 1st 1991

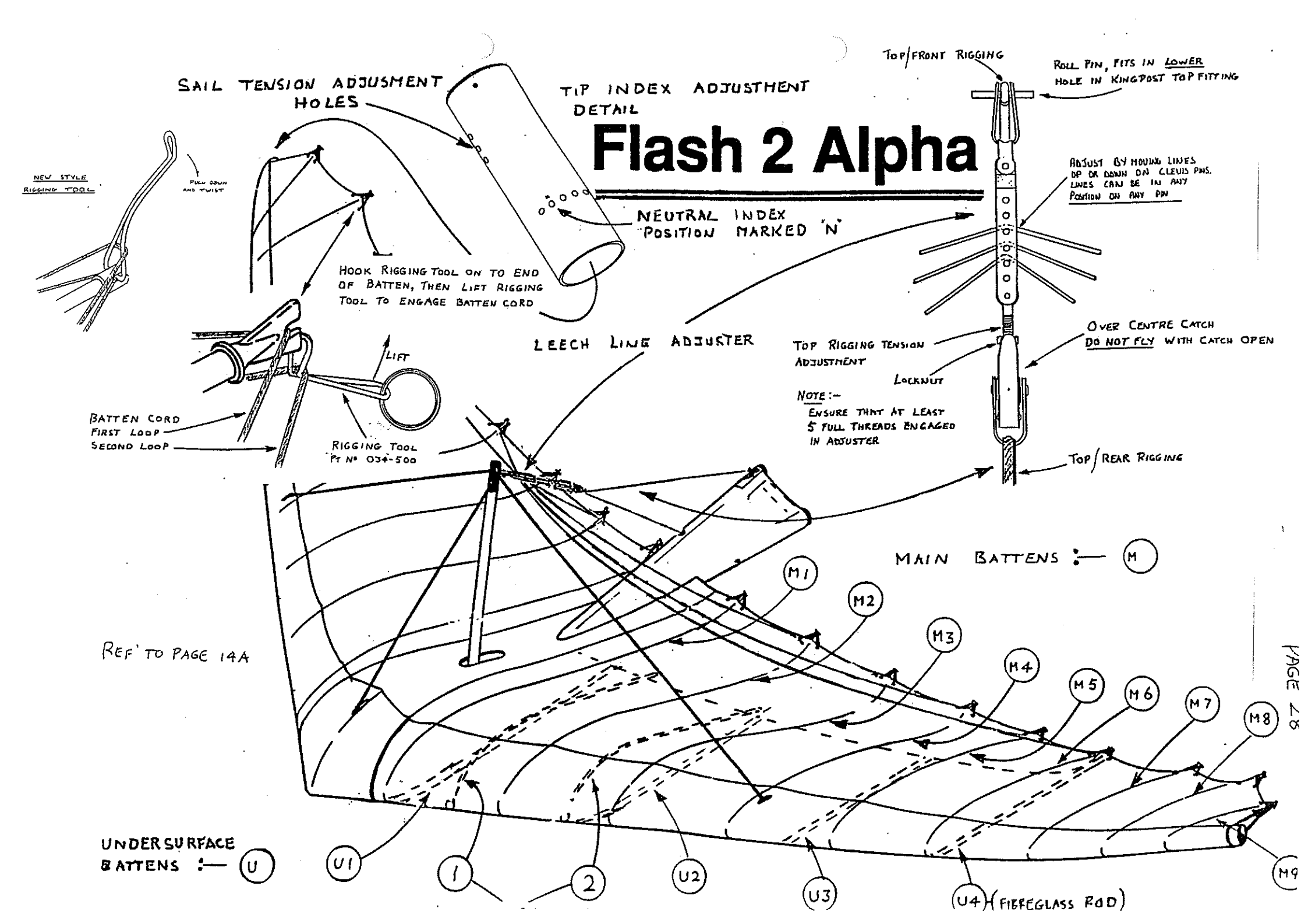
SUPERCEDES

REF	DATE	AMENDMENT
A	10-4-91	DWG CHANGED TO SUIT ALL UPRIGHT ROTAX ENGS
B	7-8-91	MUFFLER TABS TO STEEL ENTS 3WAY VALVE STANDARD FIT FIRE PROOF FILTER AFTER PUMP

MAINAIR SPORTS LTD
SHAWCLOUGH ROCHDALE
LANCS - ENGLAND -
(0706 55131)

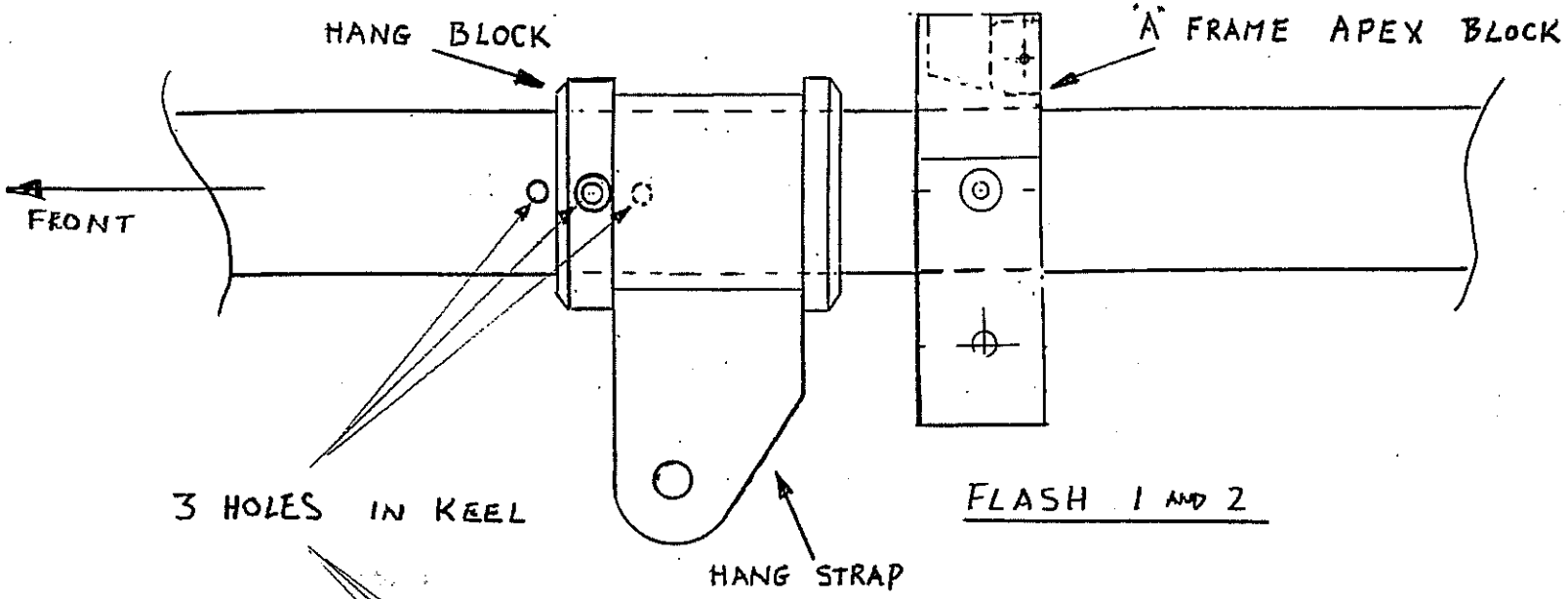
TOLERANCES UNLESS STATED OTHERWISE
GENERAL ± 1·0MM DIAMETERS ±0·05MM
CENTRES ±0.5MM

Flash 2 Alpha

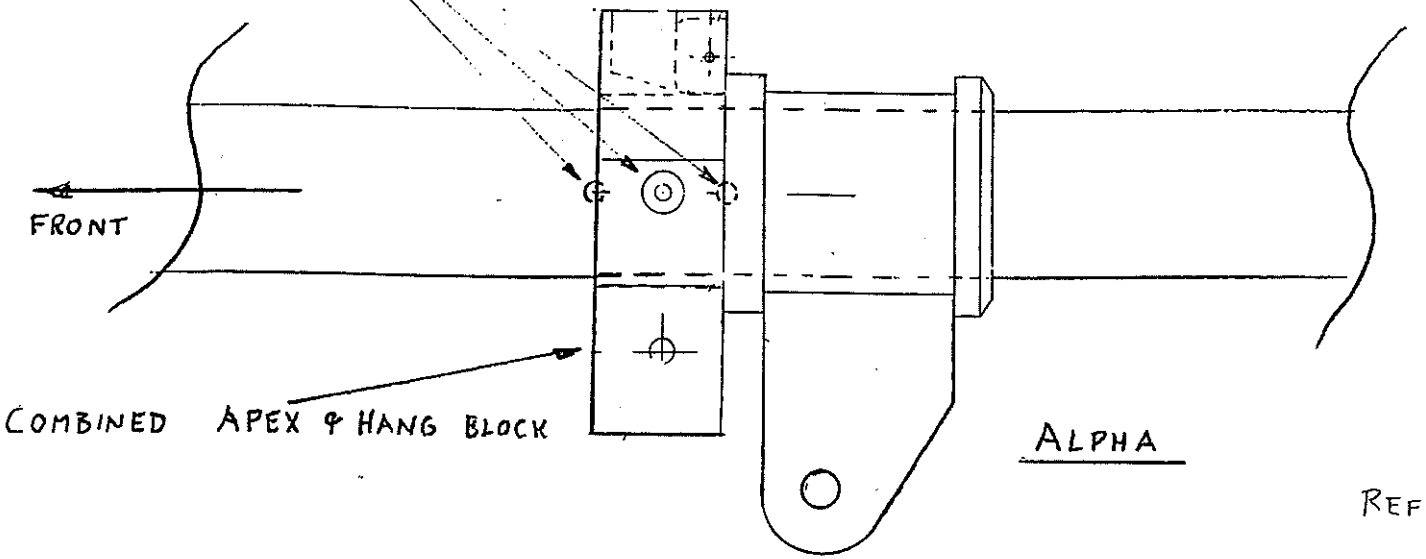


REF' TO PAGE 14A

HANG F[illegible]r ADJUSTMENT



FLASH 1 AND 2



ALPHA

REF' TO PAGE 14A

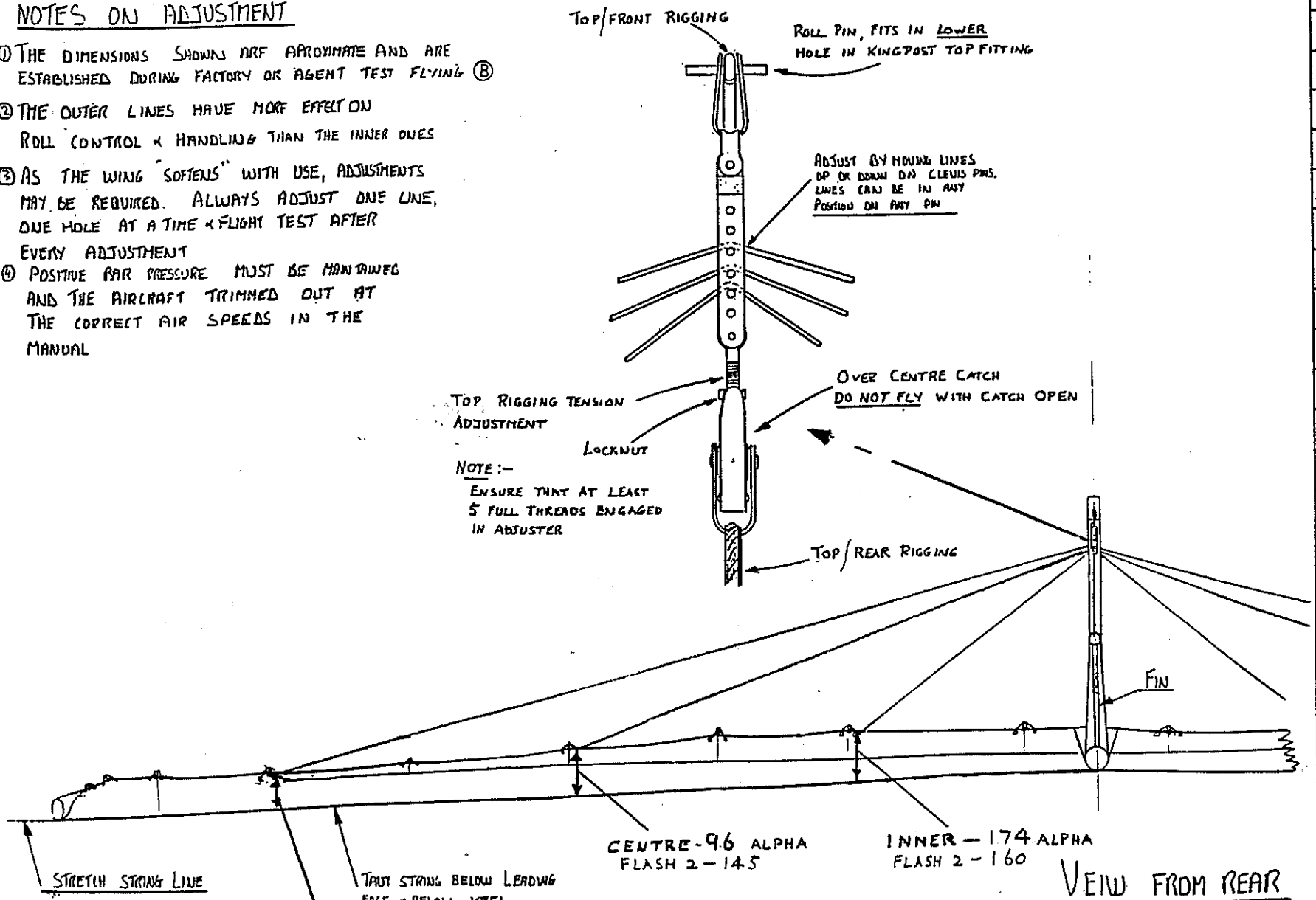
NOTES ON ADJUSTMENT

① THE DIMENSIONS SHOWN ARE APPROXIMATE AND ARE ESTABLISHED DURING FACTORY OR AGENT TEST FLYING Ⓑ

② THE OUTER LINES HAVE MORE EFFECT ON ROLL CONTROL & HANDLING THAN THE INNER ONES

③ AS THE WING "SOFTENS" WITH USE, ADJUSTMENTS MAY BE REQUIRED. ALWAYS ADJUST ONE LINE, ONE HOLE AT A TIME & FLIGHT TEST AFTER EVERY ADJUSTMENT

④ POSITIVE BAR PRESSURE MUST BE MAINTAINED AND THE AIRCRAFT TRIMMED OUT AT THE CORRECT AIR SPEEDS IN THE MANUAL



VIEW FROM REAR

NOTE DIMENSIONS MUST BE SAME ON EACH WING AND MEASURED AT SAME TI

DWG NO.	FGA 76
TITLE	ALPHA & FLASH 2 LEECH LINE SETTINGS
DATE	JANUARY 1st 1991
SUPERCEDES	

REF	DATE	AMENDMENT

MAINAIR SPORTS LTD
TEL: 0706 55134

TOLERANCES UNLESS STATED OTHERWISE
GENERAL ± 1·0MM DIAMETERS ±0·05MM