CIVIL AVIATION AUTHORITY – SAFETY REGULATION GROUP

MICROLIGHT TYPE APPROVAL DATA SHEET (TADS)

**NO:BMO 9 ISSUE: 7**

**TYPE:** Striker and Sealanders variants as listed

- Striker dual/Gemini
- Sealanders dual/Gemini
- Dual Sealanders/Triflyer
- Dual Striker/Triflyer
- Striker Dual/Triflyer
- Striker Dual/Tri-flyer 440
- Striker Dual/Lancaster
- Striker/Tri-flyer 440
- Striker/Tri-flyer
- Dual Striker/Micro Trike 440

(1) **MANUFACTURER:**

- WING: Flexiform Skysails (UK)
- TRIKE: Mainair Sports or Lancashire Microlight (UK)

(2) **UK IMPORTER:** N/A

(3) **CERTIFICATION:**

BCAR Section S requirements listed in CAA document dated 17 January 1986, ref: 9/30/UK18

(4) **DEFINITION OF BASIC STANDARD:**

As defined in MAAN 1109, 1112, 1191 and 1282

(5) **COMPLIANCE WITH THE MICROLIGHT DEFINITION**

(a) **MTOW**

322 kg

(b) **No. Seats**

varies (1 or 2)

(c) **Maximum Wing Loading**

14.64-18.5 kg/m²

(d) **Vso**

29 mph

(e) **Permitted range of pilot weights**

65 – 90 kg front seat

0 – 90 kg rear seat (if applicable)

Not more than 154 kg total seat loading

(f) **Typical Empty Weight (ZFW)**

145-150 kg

(g) **ZFW + 154 kg crew + 1 hr fuel**

319 kg

(21 litres / 15 kg)

(h) **ZFW + 86 kg pilot + full fuel**

254 kg

(25 litres / 18 kg)

(i) **Max ZFW at initial permit issue**

153 kg

---

1 Max suspended load under wing is 272kg. See note in Appendix E
(6) POWER PLANTS

<table>
<thead>
<tr>
<th>Designation</th>
<th>(Name as wing/trike combination, see page 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Type</td>
<td>Fuji Robin EC44PM, inverted</td>
</tr>
<tr>
<td></td>
<td>Fuji Robin EC44PM, upright</td>
</tr>
<tr>
<td></td>
<td>Fuji Robin EC44PM, upright</td>
</tr>
<tr>
<td></td>
<td>Fuji Robin EC44PM, inverted</td>
</tr>
<tr>
<td>Reduction Gear</td>
<td>2.67:1 belt drive</td>
</tr>
<tr>
<td>Exhaust System</td>
<td>Rotaflow</td>
</tr>
<tr>
<td>Intake System</td>
<td>Filters only</td>
</tr>
<tr>
<td>Propeller Type</td>
<td>Laminated wood</td>
</tr>
<tr>
<td>Propeller Dia x Pitch</td>
<td>62”x27”</td>
</tr>
<tr>
<td>Noise Type Cert No.</td>
<td>2M Issue 3</td>
</tr>
</tbody>
</table>

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<td>Reduction Gear</td>
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</tr>
<tr>
<td>Exhaust System</td>
<td>Nicklow</td>
</tr>
<tr>
<td>Intake System</td>
<td>Filters only</td>
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</tr>
<tr>
<td>Noise Type Cert No.</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: Fuji Robin EC442PM is an acceptable alternative to the EC44PM, but see compulsory crankshaft replacement in Annex E.

* No noise certificate number is recorded for these powerplant combinations. One must be obtained before issue of a permit to fly for examples of these variants.
(7) MANDATORY LIMITATIONS:

(A) Max Take-Off Weight 322 kg

(B) CG Limits N/A

(C) CG datum N/A

(D) Cockpit Loadings

<table>
<thead>
<tr>
<th>Front</th>
<th>Rear</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 kg</td>
<td>-</td>
<td>65 kg</td>
</tr>
<tr>
<td>90 kg</td>
<td>90 kg</td>
<td>154 kg</td>
</tr>
</tbody>
</table>

(E) Never Exceed Speed 60 kts

(F) Manoeuvring Speed 38 kts

(G) Permitted Manoeuvres

- Maximum pitch angle 30°
- Maximum bank angle 60°
- Aerobatics and Spinning prohibited

(H) Fuel Contents (Max Useable) 25 litres

<table>
<thead>
<tr>
<th>Power Plant</th>
<th>See Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>See Table</td>
</tr>
<tr>
<td>Max RPM</td>
<td>7500</td>
</tr>
<tr>
<td>Max RPM</td>
<td>6800</td>
</tr>
<tr>
<td>MAX CHT</td>
<td>250°C</td>
</tr>
<tr>
<td>MAX EGT</td>
<td>250°C</td>
</tr>
<tr>
<td>Fuel Spec</td>
<td>4 Star or Premium Unleaded</td>
</tr>
<tr>
<td>Fuel Spec</td>
<td>4 Star or Premium Unleaded</td>
</tr>
<tr>
<td>Engine Oil Spec</td>
<td>2 Stroke Oil</td>
</tr>
<tr>
<td>Gearbox oil spec</td>
<td>see manual</td>
</tr>
<tr>
<td>Fuel/Oil Mix</td>
<td>40:1</td>
</tr>
<tr>
<td>Fuel Pressure</td>
<td>n/a</td>
</tr>
</tbody>
</table>
(8) INSTRUMENTS REQUIRED:

<table>
<thead>
<tr>
<th>ASI</th>
<th>Altimeter</th>
<th>RPM</th>
<th>CHT / EGT</th>
<th>Compass</th>
<th>Coolant temp</th>
<th>Fuel Pressure</th>
<th>VSI</th>
<th>Slip ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required 0-70mph</td>
<td>Required, wrist type acceptable</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td>N/A</td>
<td>Optional</td>
<td>Optional</td>
<td>N/A</td>
</tr>
</tbody>
</table>

(9) CONTROL DEFLECTIONS:

| Steering Left | 45° | Steering Right | 45° |

(10) PILOT'S NOTES, MAINTENANCE MANUALS REFERENCES:

10.1 Manuals approved for use with this aircraft.

10.2 The following placards are to be fitted:

(a) Flight Limitations Placard (to be visible to pilot)
   See Annex D.

(b) Engine Limitations Placard (to be located near to engine instruments)
   See Annex D.

(c) Fuel Limitations Placard (to be located near to filler cap)
   See Annex D.

(d) Switches
   See Annex D.

(11) MANDATORY MODIFICATIONS / SERVICE BULLETINS / AIRWORTHINESS DIRECTIVES ETC:

See Annex A for required modifications.

(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT

Rate of Climb: 500 ft/min at 35mph
Stall or Minimum Flying Speed: 29mph
CIVIL AVIATION AUTHORITY – SAFETY REGULATION GROUP

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NO: BMO 9 ISSUE: 7

Issue History

<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>Initial issue</td>
</tr>
<tr>
<td>2</td>
<td>MAAN 1004 introduces 2.67:1 reduction drive and clarification of noise certification</td>
</tr>
<tr>
<td>3</td>
<td>Introduces Fuji robin EC442PM engine</td>
</tr>
<tr>
<td>4</td>
<td>Editorial corrections</td>
</tr>
<tr>
<td>5</td>
<td>MAAN 1109 introduces new engine/propeller combination</td>
</tr>
<tr>
<td>6</td>
<td>MAAN 1282 introduces MicroTrike variant. Illustration of compulsory wing bowsprit modification. W G Brooks, 6 June 1995</td>
</tr>
<tr>
<td>7</td>
<td>Reissue in new format, G B Gratton, 28 October 2003</td>
</tr>
</tbody>
</table>

BMAA Approval: 

G B Gratton
Chief Technical Officer
28 October 2003
Illustration of Aircraft
ANNEX A – MANDATORY MODIFICATIONS

The following modifications must be incorporated on each of the above Dual Striker and Sealander variants in order to comply with the requirements and to qualify for the issue of a Permit to Fly.

S605 Modification of Dual Striker and Dual Sealander wings according to BMAA Defect Warning 024, dated 19/11/95, must be made, covering:

(i) Extension of bowsprit,
(ii) Revision of outer bowsprit to leading edge rigging,
(iii) Revision of top front rigging,
(iv) Revision of control frame to bowsprit rigging,
(v) Addition of control frame to noseplate rigging,
(vi) Revision of the inner wing wires,
(vii) Minimum dimensions and reinforcement sleeving of control frame upright.

S627(1) On upright engined versions with Mainair reduction drive, the rear bearing mounting plates must be changed to those with modified bolt hole positions shown as “B” on Mainair Sports Service Bulletin No. 12.

S627(2) Early C brackets on the engine mounting (fabricated with very tight bend radii) must be replaced with the later type with generous bend radii.

S627(3) A stainless steel tang must be incorporated between the engine torque rigging wire thimbles and the junction of the side strut.

S689 Where hand and foot throttles are combined in a joining box (two cables into one), each end of each cable must be wire locked to retain the outer in its locating ferrule.

S787 Where a baggage pouch is provided this must be labelled limiting its use to loads no more than 2kg.

S901 An electrical bond is to be incorporated between the engine and the airframe.

S903 The reduction drive shaft must be replaced with one of the same dimensions to at least EN24T specification. The shaft must be stamped “T” on the end to signify the shaft has been modified.

On Fuji Robin powered machines, the ¼” propeller bolts must be replaced with M8.8 or S96 spec 5/16” ones. 5/16” Propeller bolt torque is 8-10 ft/lb.

Where 3mm propeller load spreading faceplates are used, these must be replaced with ¼” HS30TF or NS8 aluminium alloy ones or steel washers of at least 1mm thickness and 30mm diameter be fitted so as to spread the load.

S993 A fire resistant fuel line(s) must be fitted for a distance of at least 45cm (18”) from the engine and routed as far as possible on the opposite side of the engine to the
exhaust.

S1141 The wiring for the ignition switch must be fire resistant adjacent to the engine or located so that in the event of an engine fire the engine can be stopped. Note: Ignition wiring located forwards of fuel carrying components is considered to satisfy this requirement.

S1145 The ignition switch must be rated at at least 250 volts.

S1303 Where an altimeter is not permanently installed, a wrist mounted altimeter is acceptable; in such cases a placard must be installed stating clearly that a wrist mounted altimeter is required.

S1519 A placard is to be installed in full view of the pilot stating “maximum suspended load from the wing 272kg” or a placard for each individual aeroplane giving the maximum all up weight derived from the suspended load limit of 272kg and the trike with full fuel.

S1542 A placard is to be installed in full view of the pilot which quotes the limiting speeds $V_A$ and $V_{NE}$ defined in these TADS.

In addition: as a further condition of Type Acceptance the pilot must wear a protective crash helmet and the aircraft be placarded to this effect.

**ANNEX B - APPROVED OPTIONAL MODIFICATIONS**

The installation of all optional modifications is to be inspected by a BMAA inspector and an entry made in the appropriate logbook(s). Note that other approved modifications may exist which are not listed here.

| Mod No. | Subject | Status | AAN No. |
### ANNEX C
WEIGHING INFORMATION

1. CG Datum: n/a
2. Weighing attitude: n/a
3. Mainwheel moment arm: n/a
4. Nosewheel moment arm: n/a
5. Main tank moment arm: n/a
6. Pilot moment arm: n/a
7. Passenger moment arm: n/a
8. Crew weights: Front, min 65kg, max 90kg  
Rear, min 0kg, max 90kg  
No more than 154kg total cockpit load  
No more than 272kg to be suspended from wing
9. Aft CG Limit: n/a
10. Fwd CG Limit: n/a
ANNEX D

PLACARDS

(a) Flight Limitations Placard (to be visible to pilot)

A placard showing $V_A$, $V_{NE}$ and permitted manoeuvres to be visible to the pilot.

A placard is to be installed in full view of the pilot stating “maximum suspended load from the wing 272kg” or a placard for each individual aeroplane giving the maximum all up weight derived from the suspended load limit of 272kg and the trike with full fuel.

A placard requiring occupants to wear protective helmets must be displayed.

(b) Engine Limitations Placard (to be located near to engine instruments)

All engine instruments to be marked showing amber for caution and red for limits, or a placard adjacent to the instruments showing limitations.

(c) Fuel Limitations Placard (to be located near to filler cap)

A placard is to be mounted showing fuel tank capacity and types of fuel permitted.

(d) Switches

All switches are to be marked with function and sense (up=on, down=off).
In service, the following points have been found to be commonly recurring problems, and Inspectors must give special attention to the following both during initial approval, and during later inspections.

The review of the compliance of the listed Dual Striker and Sealander variants listed above with the airworthiness requirements of the nominated paragraphs of BCAR Section S has indicated a number of areas where particular attention must be given by each BMAA Inspector responsible for inspection of such aeroplanes and these are listed below:

S605  (i) Pylons must be checked for cracks and fretting immediately above the seat frame main channel position and paying particular attention to the area around the 1/4” diameter attachment holes for the side struts (see Mainair Sports bulletin no. 17).

(ii) Check that the pylon has a backup wire of at least 4mm and that it is tight between its two connections.

(iii) Where a bicycle type front fork pivot is used (silver coloured), check for cracks. If damage is evident, replace with nylon bearing type pivot.

(iv) Ensure Mainair Sports service bulletin no. 18 has been complied with regarding the rear engine plate. Erect trailering of the trike is advised to prevent damage.

(v) On Gemini trike units check the front strut to keel bracing bracket for signs of failure. Advise that the front strut is not to be used to push or pull the trike.

S607 Check for correct assembly and locking of wheels onto axles.

S609 Check that any flexible coating or covering of steel components has been removed and that alternative non-flexible protective coating or plating is used.

S612 Tangs and thimbles at rigging ends must be checked to ensure the thimble has not been twisted around the tang. The use of Never Kinks or heat shrink tubing is advised to prevent kinking.

S671 Ensure that the throttle controls work smoothly under all conditions without sticking. Ensure that Mainair Sports service bulletins 10, 14 and 17 are met.

S901  (i) The spark plug caps should be held in place by straps to the cylinder head casing.

(ii) The Nicklow reduction drive shaft must be changed for one of at least EN24T specification. A “T” must be stamped on the end to signify this modification is incorporated.
(iii) Check all the engine and reduction drive mounting plates including the head stay, for fatigue cracks. A twenty hour maximum inspection interval is advised. In particular, on upright engine installations check for:
   a) No undercut on the walls of the bearing recess which would significantly reduce the material thickness between the recess wall and the flange mounting holes.
   b) No scratches or machining marks on highly stressed areas of the plate (remove by polishing if necessary).
   c) Correct alignment of the plate, without bend or twist due to cylinder head angle and bottom angle.

(iv) Check the reduction drive bearing outers do not turn in their housing (Mainair service bulletin no 15).

(v) Ensure that any bearing spacer on the reduction drive shaft is firmly locking the bearings in position. Replace if worn with a new steel tubular spacer.

(vi) Check that the propeller hub casting shows no sign of cracking immediately forward of the propeller boss (see Mainair service bulletins 14 & 15).

(vii) Where the Fuji Robin 2PM engine is installed (e.g. EC442PM), the crankshaft must be replaced with a heavy duty unit. The Heavy Duty crank is identified by the size of the magneto end nut which is 32mm across the flats. Engines with the Heavy Duty crankshaft are often identified with the stamp “CX” on the casing below the engine serial number plate and on the face of the starter motor flange.

(viii) Check for any looseness of propeller bolts at the flange.

S903 On units with “trough like” cast reduction drive systems, pay particular attention to propeller balance which must be checked every 20 hours. Advise parking with propeller horizontal to prevent asymmetric water ingress. Ensure the reduction drive jacking studs are replaced every 50 hours, or are replaced with M8.8 spec bolts and solid metal shims.

S925 Propeller clearance. It is essential that each wing installed on an individual trike is inspected and checked for adequate clearance of all rigging and components, in particular with respect to the complete propeller arc, making proper and full allowance for all possible positions of the wing either in flight or on the ground. The minimum acceptable clearance in the radial plane is 75mm.

S951 Check that the layout of fuel lines does not give rise to potential vapour locks.

S975 Fuel tank vents. Inspection must be made to satisfy that the fuel tank vent discharges clear of the aeroplane.

S995 Check that fuel valves and controls are properly installed according to the
requirements of S995.

S1125 Check for cracks throughout the exhaust and loose baffles. If only two mounting points are used then ensure that a backup wire is fitted to prevent failure of a mounting allowing the exhaust to foul the propeller.

S1301 **Equipment, function.** The suitability, function and safe installation of equipment installed must be checked by inspection for each aircraft.

S1303 Where an altimeter is not installed, a placard must be furnished stating a wrist altimeter must be worn.

S1519 A placard is to be installed in full view of the pilot stating “maximum suspended load from the wing 272kg” or a placard for each individual aeroplane giving the maximum all up weight derived from the suspended load limit of 272kg and the trike with full fuel.

S1542 A placard is to be installed in full view of the pilot which quotes the limiting speeds $V_A$ and $V_{NE}$ defined in these TADS.

The following Mainair Sports service bulletins must be complied with:
- No. 11, modification to reduction drive casting (Mainair reduction drive only).
- No. 13, modification to provide additional fuel line retention on versions with fuel tanks behind the pilots seat.
OLD DESIGN
SHORT BOWSPRIT
ILLEGAL IN UK.

NEW DESIGN
EXTENDED BOWSPRIT
MANDATORY MODIFICATION.

TOP RIGGING WIRES 'A' APPLY TO DUAL ONLY.