

TYPE: Thruster TST Mk 1

- | | | |
|-----|---|--|
| (1) | MANUFACTURER | Tempest Aviation (UK)
Continued Support: Thruster Aircraft LLP
North Hanger
Wickenby Airfield
Langworth, Lincolnshire
LN3 5AX |
| (2) | UK IMPORTER: | N/A |
| (3) | CERTIFICATION: | BCAR Section S Advance Issue March 1983 plus paper D37/112/1 dated 11 th October, 1988 |
| (4) | DEFINITION OF BASIC STANDARD: | Thruster TST Mk 1 Master G/A Drawing 05-005 1.2, Issue 1 dated 6.9.1988 and Drawings list Form F33A latest issue 26.2.1991 |
| (5) | COMPLIANCE WITH THE MICROLIGHT DEFINITION | |
| | (a) MTOW | 361 kg |
| | | With TAL 03-6 + Aerofoil Struts 380 |
| | (b) No. Seats | 2 |
| | (c) Maximum Wing Loading | 25 kg/m ² |
| | (d) V _{so} | 32 kn CAS |
| | (e) Permitted range of seat loading | 55-86 kg per seat. |
| | (f) Typical Empty Weight (ZFW) | 174 kg |
| | | 182 kg With TAL 03-6 + Aerofoil Struts |
| | (g) Max ZFW + 172 kg crew + 1 hr fuel (21 litres) | 361 kg |
| | With Mod TAL 03-6 | 380 kg |
| | (h) Max ZFW + 86 kg pilot + full fuel (38 litres) | 298 kg |
| | With Mod TAL 03-6 | 317 kg |
| | (i) Max ZFW at initial permit issue | 174 kg |
| | With Mod TAL 03-6 | 193 kg |

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(6) POWER PLANTS

Designation	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>	<i>TST MK 1</i>
Engine Type	<i>Rotax 503 2v FA SS</i>	<i>Rotax 503 2v FA SS</i>	<i>Rotax 503 2v FA SS</i>	<i>Rotax 503 2v FA SS</i>	<i>Rotax 503 2v DCDI</i>	<i>Rotax 503 2v DCDI</i>	<i>Rotax 503 2v DCDI</i>	<i>Rotax 503 2v DCDI</i>
Reduction Gear	2.58:1	2.58:1	2.58:1	2.58:1	2.58:1	2.58:1	2.58:1	2.58:1
Exhaust System	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>	<i>Rotax straight. After Muffler Optional</i>
Intake System	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>	<i>Air Filter</i>
Propeller Type	<i>Catto 2 Blade Wooden</i>	<i>Catto 2 Blade Wooden</i>	<i>Catto 3 Blade composit</i>	<i>Brolga 2 Blade</i>	<i>Catto 2 Blade Catto 3 Blade composit</i>	<i>Brolga 3 Blade</i>	<i>Brolga 3 Blade</i>	<i>Brolga 2 Blade</i>
Propeller Dia x Pitch	64" x 42"	64" x 37"	64" x 30"	68" x 13 °	64" x 37" 64" x 30	68" x 09 °	60" x 16 °	68" x 13 °
Noise Type Cert No.	44M	44M	44M	44M	44M	44M	44M	44M
AAN approving configuration	19735P 20355	19735P 20355	19735P 20355 23605	19735P 20355 25244	19735P 20355 23605	19735P 20355 25244	19735P 20355 25244	19735P 20355 25244

(7) MANDATORY LIMITATIONS:

(A) Max Take-Off Weight	Basic	With aerofoil lift struts to Mod TAL 03-6
	361kg	380kg
(B) CG Limits	Aft limit 495mm Aft of datum FWD limit 370mm Aft of datum	
(C) CG datum	Front of leading edge spar (see annex C).	
(D) Cockpit Loadings	<u>Port</u>	<u>Starboard</u>
	Min Kg	55
	Max Kg	86
(E) Never Exceed Speed	80 KIAS	
(F) Manoeuvring Speed	70 KIAS	
(G) Permitted Manoeuvres	30° Nose up / 30° nose down Non Aerobatic Normal acceleration limits, +4 / -2g	
(H) Fuel Contents (Max Useable)	Fibreglass tank	33 litres
	Aluminium "40 litre" tank	38 litres
	Aluminium "25 litre" tank	25 litres

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(I) Power Plant

See Table

Engine	<i>Rotax 503 2v FA SS</i>	<i>Rotax 503 2v DCDI</i>		
Max RPM	6800/6500*	6800/6500*		
MAX CHT	250°C (480°F)	250°C(480°F)		
MAX EGT	650°C (1200°F)	650°C (1200°F)		
Fuel Spec	83 MON or 90 RON minimum unleaded to BS(EN)228 or 97+ octane 4-star /MOGAS leaded fuel to BS 4040, or AVGAS 100LL.			
Engine Oil Spec	Non Deterg 2 Stroke Self Mix	Non Deterg 2 Stroke Self Mix		
Gearbox oil spec	SAE 140 EP- API-GL5	SAE 140EP- API-GL5		
Fuel/Oil Mix	50:1	50:1		
Coolant Temperature	-na-	-na-		
Oil Pressure	-na-	-na-		
Oil Temperature	-na-	-na-		
Fuel Pressure	-na-	-na-		

* Brolga Propeller Limitation

(8) INSTRUMENTS REQUIRED:

ASI	Altimeter	RPM	CHT / EGT	Compass	Coolant temp	Fuel Pressure	VSI	Slip ball
Required 100 Kts min.)	Required	Required	Required	Optional	-na-	-na-	Optional	Optional

(9) CONTROL DEFLECTIONS: (3-AXIS SYSTEMS):

Elevator UP:	30°+/- 2°	Tailplane trim UP:	-na-
Elevator DOWN:	30°+/- 2°	Tailplane trim DOWN	-na-
Ailerons UP:	30°+/- 2°	Rudder LEFT:	25°+/- 2°
Ailerons DOWN:	30°+/- 2°	Rudder RIGHT:	25°+/- 2°

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

10.1 Manuals approved for use with this aircraft.

Thruster TST Pilots and Operators Handbook Part No. TAPL 02

- (a) * Change Sheet 2 is required with Brolga propellers.
- (b) * Change Sheet 4 is required for Ultralam Coverings
- (c) POH Supplement 01 Performance

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)

A placard is to be fitted showing fuel capacity (litres), fuel type(s), fuel:oil ratio (if relevant) and if MTOW can be exceeded with full fuel and maximum cockpit weight, the fuel loads at MTOW for cockpit weights of 180kg / 170kg / 160kg etc. at 10kg intervals down to the maximum fuel load. An example is shown at Annex D.

- (d) Switches
See Annex D.

(11) MANDATORY MODIFICATIONS / SERVICE BULLETINS ETC:

See Annex A for required modifications.

Annual Bettsometer test is to be carried out to 1320 grammes with wing sails fitted and tensioned to flight. Test must be to both upper and lower surfaces.

NB: A definitive list of Mandatory actions and Service Bulletins is to be obtained by reference to CAA and the Thruster Aircraft Website [www.thruster.co.uk]

(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT

Rate of Climb: 500 fpm at 45 KIAS.

Stall or Minimum Flying Speed: 35 KIAS at MTOW / idle.

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Issue History

<u>Issue No.</u>	<u>Reason and signatory</u>
2	11/10/90 F J TUCKER
3	28/11/90 F J TUCKER
4	Not formally issued
5	22/08/95 Added modification listing. Service Bulletin TAS/SB01 for return to compliance with BCAR Section S added, together with alternative fuel tanks, modified area accounting with wing aerofoil lift struts, increase in MTWA. A C LOVE
6	13/06/97 Propeller options (with 6500 rpm limit) added to Modification TAS 004 (Airworthiness Approval Note No. 25244). A C LOVE
7	10/05/99 Propeller option added to modification TAS 009 (AAN 26863) A J MAXWELL
8	15/06/99 Alternative material for wing and empennage skins - modification TAS 010 (AAN 26144) A J MAXWELL
9	03/09/03 Revised to new format
10	16/02/05 Corrections to Cockpit Loading, Control Deflections, Weighing Information and Example Placards. A J MAXWELL
11	06/11/07 Editorial Corrections A J MAXWELL
12	05/05/12 Editorial Corrections, Corrections to Cockpit Loading, Control Deflections AAIB Safety action addition of “Area Of Special Attention” ANNEX E


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Illustration of Aircraft - 3 View

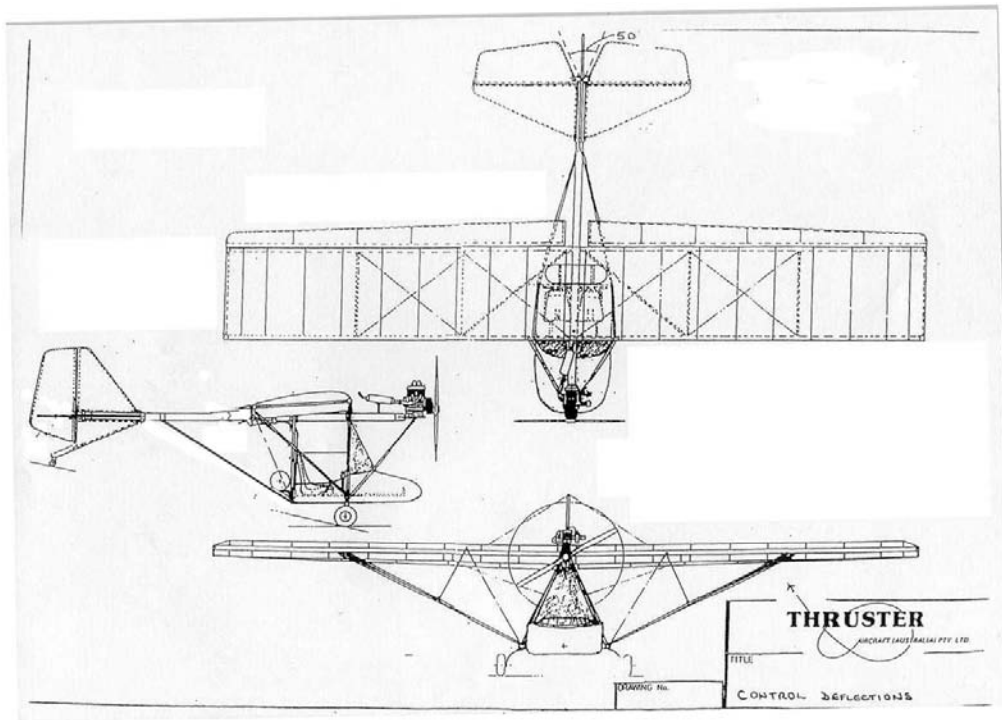


Illustration of Aircraft – Photograph



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ANNEX A – MANDATORY MODIFICATIONS

1. TAUk SB-001 Defective Joystick Eye Bolts
TAS/SB01 Iss. 1 Empty Weight

NB: A definitive list of Mandatory actions is to be obtained by reference to CAA published Mandatory Permit Directories. The list on this TADS is not necessarily up-to-date. Also see Thruster website @ www.thruster.co.uk for latest information

ANNEX B - APPROVED OPTIONAL MODIFICATIONS

Below is a list of minor modifications approved by Thruster Air Services. 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. Also see Thruster website @ www.thruster.co.uk for latest information

Thruster Mod	Date	Title
TUKM-001		Rear fuselage boom brace tubes
TUKM-002		Revised Rudder Pedal assy
TUKM-003		Introduces steel tube tail plane assy
TUKM-004		Ground Adjustable seat
TUKM-005		Angles rear "A" Frame
TUKM-006		Change to Control Stick Ali to Steel
TUKM-007		Details of Aileron root and tip fittings
TUKM-008		Details changes to wing Jury struts
TUKM-009		Detail changes to Throttle lever system
TUKM-10		Introduction of Ali instrument Panel
TUKM-011		Introduce extra stiffening sleeve Wing Bay
TUKM-012		Introduce Separate exhaust mounting Brkt
TUKM-21-032		Mod to main axle and spring
TUKM-21-033		Detail change to rear jury strut
TUKM-21-034		Revised Tailwheel steering
TUKM-21-035		re-Rout Ruder Cables
TUKM-21-036		Improve Throttle Torque Tube
TUKM-21-037		Changes to main "A"frame/Fuse Brkt
TUKM-21-038		Introduce Ali fuel Tank
TUKM-21-041		Overhead Instrument Panel
TUKM-21-044		Subframe and seat rail changes
TUKM-21-045		Elevator Crank Improvement
TUKM-22		Electric Start Facility
91-01	17/07/1991	Aluminium Fuel Tank
91-02		Cockpit Pod new style
91-03		Cockpit Sub assy
91-04		Aileron Torque Tube

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ANNEX B - APPROVED OPTIONAL MODIFICATIONS Cont...

<u>Thruster Mod</u>	<u>Date</u>	<u>Title</u>
TAL-01		Catto 3 blade Propeller
TAL 03-3	12/02/1992	Rotax Exhaust After Muffler
TAL 03-9	12/02/1992	GRP Wheel Spats
TAL 03-20	12/02/1992	GRP Wing Tip Cap
TAS 010	10/07/1997	Ultralam Wing Skins
TAS 013	02/12/1997	Ivo Prop Installation
TAS 015	29/09/1997	Disabled Person Mod “Crip Kit”
TAS 017	10/09/1998	Fitting Back and Doors TST
TAS 030	01/03/2004	Carburettor Inlet Heater
TAS 031	01/03/2004	Wing Strobe Lights
TAS 034	01/03/2004	Battery Isolator Switch
TAS 037	01/03/2004	Wider Nose Wheel

NB Some early aircraft may have wheels with aluminium hubs fitted with either 10" or 13" aircraft standard tyres or nylon hubs fitted with 10" or 13" tyres. Current build standard is aluminium wheels with 500-5 tyres and tubes.

ANNEX C

WEIGHING INFORMATION

1. CG Datum: Front of Leading Edge Spar Tube
2. Weighing attitude: Fusetube Level
3. Mainwheel moment arm: 31.5mm Aft of Datum
4. Tailwheel moment arm: 4075mm Aft of Datum
5. Fuel moment arm: 1030 (mm) (Aft) of datum
6. Crew moment arm: 410 (mm) (Aft) of datum (Front Seat position)
448 (mm) (Aft) of datum (Mid Seat Position)
486 (mm) (Aft) of datum (Rear Seat Position)
7. Crew weights: Minimum 55 kg / maximum 86 kg
(maximum reducible, not below 86 kg, if required).
8. Aft CG Limit: 495 (mm) (Aft) of datum
9. Fwd CG Limit: 370 (mm) (Aft) of datum

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ANNEX D

EXAMPLE PLACARDS

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

	<u>[Type]</u>	<u>[Engine]</u>	<u>[Registration]</u>
Never Exceed Speed:	80	80	KIAS
Manoeuvring Speed :	70	70	KIAS
Stall Speed:	32	32	KIAS
Best climb speed:	50	50	KIAS
Best glide speed:	45	45	KIAS
Pitch Limits:	30° nose down, 30° nose up.		
Bank angle limits:	+/- 60°		
Maximum Stall entry rate:	1 kn/s		
Normal Acceleration Limits:	+4 / -2g		
Empty Weight:	174 kg or 193kg *		
Max Take-Off Weight:	361 or 380 kg		
Minimum Cockpit Weight:	55 kg		
Maximum Cockpit Weight:	86 kg in each seat.*		
Aerobatics and deliberate spinning prohibited.			

* This must match the most recent W&CG report for the aircraft.

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

A placard showing the limitations for all indicated engine parameters is to be mounted close to the engine instruments. This requirement need not be complied with for limitations shown as coloured markers (red for danger, amber for caution) on the instrument displays.

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

<u>FUEL</u>	
Capacity * Litres	
50:1 2 Stroke oil	
<u>Cockpit Weight (kg)</u>	<u>Max. Fuel Load (litres)</u>
180	
170	
....	
.... Or below	Full fuel
83 MON or 90 RON minimum unleaded to	
BS(EN)228 or 97+ octane 4-star / MOGAS leaded	
fuel to BS 4040, or AVGAS 100LL	

* dependant on Fuel Tank Fitted

(d) Switches

All switches are to be marked with function and sense (up=on, down=off).

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ANNEX E

Areas for Special Attention During Inspections

1. Carburettor Heating System to minimise risk of Carburettor Icing. An accident caused by Carburettor Icing has been reported which was due in part to the Carburettor Heating system being fitted on the inlet of the Carburettor rather than the outlet.. Check that the installation is approved and operational.