



LAA TYPE ACCEPTANCE DATA SHEET  
TADS 204  
RANS S6-ES

Issue 9	New format. Addition of fuel system arrangements to section 3.2. Additional manufacturer's information in section 3.3. Additional notes in sections 3.4 and 3.5.	Dated 3/7/13	JV
Revision A	Update of UK agent contact details. Clarification of cg datum. Additional manufacturer's information in section 3.3. Minor editorial changes.	Dated 16/6/16	JV
Revision B	Addition of Rans heater installation as a standard option. Update of UK agent contact details.	Dated 20/7/18	JP

This TADS is intended as a summary of available information about the type and should be used during the build, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete as possible, other sources may contain more up to date information, e.g. the manufacturer's website.

Section 1 contains general information about the type.

Section 2 contains information about the type that is **MANDATORY** and must be complied with. The annual Permit to Fly renewal (revalidation) process requires a Declaration by the inspector and owner that the Requirements of Section 2 have been complied with.

Section 3 contains advisory information that owners and inspectors should review to help them maintain the aircraft in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

## Section 1 - Introduction

### 1.1 UK contact

Skycraft Ltd., Riverside House, Bloodfold Farm, Ravens Bank, Holbeach, PE12 8SR.

Tel: 01406 371779  
Email: [sales@sky-craft.co.uk](mailto:sales@sky-craft.co.uk)  
Website: [www.sky-craft.co.uk](http://www.sky-craft.co.uk)

### 1.2 Description

The Rans S6-ES is a high wing microlight seating two side by side in an enclosed cockpit, and is available in kit form for amateur construction from Rans Inc of Kansas, and originally distributed by Sportair UK, more recently the dealership has been taken over by Skycraft.

The airframe is mainly of bolted and riveted aluminium tube construction, but the forward fuselage structure consists of a welded steel tube cage. The entire airframe is covered by pre-sewn stitched Dacron envelopes.

The Rans S6-ES is a close relative of the lighter-weight Rans S6-ESD, the main differences being the substitution of narrower chord flaps and ailerons on the 'ES' model,



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along with updated front wing lift struts and either single or twin 6 ½ imp gallon polythene fuel tanks in the wing roots rather than a single rear fuselage tank. The wing and aileron/flap configuration of the Rans S6-ES model is designated an 'area 2 wing' by Rans. The S6-ES is available either with tailwheel or nosewheel type undercarriage.

Engine models currently approved in the UK for use in the S6-ES are the Rotax 503, Rotax 582, Rotax 912-UL and Jabiru 2200A. Note that the only propeller(s) approved for an individual aircraft are those listed on the individual aircraft's Operating Limitations document or in the [PTL/1](#) (Propeller Type List) for the type.

The Rans S6-ES is a microlight aeroplane with a maximum gross weight normally of 450 kg but restricted to 430 kg with the Rotax 503 option, for performance reasons.

### Section 2 – Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft rests with the owner. Condition No 3 of a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition"*.

#### 2.1 Fast Build Kit 51% Compliance

The contents of the standard fast build kit is accepted as compliant with the 51% 'major portion' requirements on the basis that it is the same kit standard that has been accepted as 51% compliant by the FAA.

#### 2.2 Build Manual

Rans provide a comprehensive build manual for the S6-ES, referred to by Rans as an 'S6-ES Coyote II'.

#### 2.3 Build Inspections

Build inspection schedule 9 (Tubular aircraft).  
Inspector approval codes A-A, A-M, K or M. Inspector signing off final inspection also requires 'first flight' endorsement.

#### 2.4 Flight Manual

A set of pilot's notes for the Rans S6-ES are included in the build manual.

#### 2.5 Mandatory Permit Directives

Applicable specifically to this aircraft type:

- [2003-017 R1](#) Restraint harnesses of unsatisfactory type
- [2003-018 R1](#) Restraint harnesses condition

Also check the LAA website for MPDs that are non-type specific ([TL2.22](#)).

2.6 LAA Required Modifications (including LAA issued AILs, SBs, etc)

Several modifications were required by the LAA for acceptance of the type in the UK, as follows:

<a href="#">LAA-204-001</a>	Idler arm in elevator control pushrod
<a href="#">LAA-204-002</a>	Positive locking of control surface hinges
<a href="#">LAA-204-003</a>	Elevator bungee type trim addition of markings
<a href="#">LAA-204-004</a>	(not applicable to S6-ES model)
<a href="#">LAA-204-005</a>	Tab type elevator trim – addition of trim tab stops and pivot wire locking
LAA-204-006	Cockpit static source
LAA-204-007	Gascolator fitted forward of firewall
LAA-204-008	Fire resistant type rubber fuel pipe substituted in engine compartment
LAA-204-009	Fuel filler cap forward facing vent placards
<a href="#">LAA-204-010</a>	Pilot and Passenger restraint harness. (Add swivel fitting – MPD 2003-017 refers)
<a href="#">LAA-204-011</a>	Inspection of seat harness condition (MPD 2003-018 also refers)
<a href="#">MOD/204/012</a>	Flying wire cable attach tangs – cracking

2.7 Additional engine operating limitations to be placarded or shown by instrument markings

Notes:

- Refer to the engine manufacturer's latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.

With Rotax 503 engine:      Max CHT: 250°C (normal 180-220°C)  
    Max difference: 20°C  
    Max EGT: 650°C (normal 460-580°C)  
    Max difference: 25°C

With Rotax 582 engine:      Max CHT: 150°C (normal 110-130°C)  
    Max difference: 10°C  
    Max EGT: 650°C (normal 500-620°C)  
    Max difference : 25°C  
    Max Coolant temp: 80°C

With Jabiru 2200A:            Max CHT: 210°C  
    Oil temp: 50-110°C  
    Oil pressure 125-525 kPa @3100 RPM

With Rotax 912-UL:            Maximum CHT: 150°C  
    Max Coolant Temp: 120°C (with 50/50 Glycol/water coolant)  
    Oil Temp Limits: 50°C to 140°C (Normal 90-110°C)  
    Oil Pressure: 2-5 Bar  
    Minimum Fuel Pressure: 0.15 bar



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2.8 Control surface deflections

Ailerons	Up: $x^\circ \pm x^\circ$ Down: $x^\circ \pm x^\circ$
Elevators	Up: $30^\circ \pm x^\circ$ Down: $20^\circ \pm x^\circ$
Elevator tab	Up: $17^\circ \pm x^\circ$ Down: $20^\circ \pm x^\circ$
Rudder	Left: $x^\circ \pm x^\circ$ Right: $x^\circ \pm x^\circ$
Flap	Down: 40-45°

2.9 Operating Limitations and Placards

(Note that the wording on an individual aircraft's Operating Limitations document takes precedence, if different.)

1. Maximum number of occupants authorised to be carried: two
2. The aircraft must be operated in compliance with the following operating limitations, which shall be displayed in the cockpit by means of placards or instrument markings:

2.1 Aerobatic Limitations

The aeroplane is permitted to fly only for non-aerobatic operation. In this context, non-aerobatic operation includes:

- i) any manoeuvre necessary for normal flying.
- ii) intentional stalls from level flight.
- iii) steep turns in which the angle of bank does not exceed 60 degrees. Intentional spinning is prohibited.

2.2 Loading Limitations (with Rotax 503 engine)

Maximum Total Weight Authorised: 430 kg

CG Range: 62.5 inches to 71.0 inches aft of datum at up to 295 kg, 66.0 to 71.0 inches aft of datum at 430 kg. Linear variation between 295 kg and 450 kg

Datum Point is: rear face of the propeller

Loading Limitations (with Rotax 582 engine)

Maximum Total Weight Authorised: 450 kg

CG Range: 62.5 inches to 71.0 inches aft of datum at up to 295 kg, 66.0 to 71.0 inches aft of datum at 450 kg. Linear variation between 295 kg and 450 kg

Datum Point is: rear face of the propeller

Loading Limitations (with Rotax 912-UL engine)

Maximum Total Weight Authorised: 450 kg

CG Range: 62.5 inches to 71.0 inches aft of datum at up to 295 kg, 64.0 to 71.0 inches aft of datum at 450 kg. Linear variation between 295 kg and 450 kg

Datum Point is: rear face of the propeller

Loading Limitations (with Jabiru 2200A engine)

Maximum Total Weight Authorised: 450 kg



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CG Range: 62.5 inches to 71.0 inches aft of datum at up to 295 kg, 66.0 to 71.0 inches aft of datum at 450 kg. Linear variation between 295 kg and 450 kg  
Datum Point is: a point 2.0inches forward of the rear face of the propeller<sup>1</sup>

- 2.3 Engine Limitations (Rotax 503 engine and Rotax 582 engine)
  - Maximum Engine RPM: 6800
  - Maximum continuous engine RPM: 6500
- Engine Limitations (Rotax 912-UL engine)
  - Maximum Engine RPM: 5800
  - Maximum continuous engine RPM: 5500
- Engine Limitations (Jabiru 2200A engine)
  - Maximum Engine RPM: 3300
- 2.4 Airspeed Limitations
  - Maximum indicated airspeed: 110 mph
  - Maximum indicated airspeed, flaps extended: 65 mph
- 2.5 Other Limitations
  - The aircraft shall be flown by day and under Visual Flight Rules only.
  - Smoking in the aircraft is prohibited.

Additional Placards:

“Occupant Warning - This Aircraft has not been Certificated to an International Requirement”

A fireproof identification plate must be fitted to fuselage, engraved or stamped with aircraft’s registration letters.

As a microlight aircraft, additional microlight weight placard must be fitted as described in [TL2.11](#) regarding empty weight and payload.

2.10 Maximum permitted empty weight

<b>Model</b>	<b>Engine</b>	<b>Max empty weight</b>
Rans S6-ES	Rotax 503	243 kg
	Rotax 582	260 kg
	Rotax 912-UL	268 kg
	Jabiru 2200A	268 kg

**Section 3 – Advice to owners, operators and inspectors**

3.1 Maintenance Manual

Nil. In the absence of a manufacturer’s maintenance schedule for the airframe, refer to LAMS schedule. Refer to build manual for rigging instructions. For engine consult engine manufacturer’s schedule.

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<sup>1</sup> Note that this relates to the Jabiru engine, standard Jabiru engine mount and standard Jabiru propeller flange. If these items are not fitted, the equivalent datum is a point 1290 mm forward of the front face of the lower wing strut fitting.



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3.2 Standard Options

(Subject to empty weight considerations)

Spinner  
Wheel pants  
Baggage compartment  
Hagar wheels/brakes  
Battery box installation  
Nosewheel or tailwheel undercarriage  
Elevator trim tab or bungee bias trim  
Single or dual wing tanks  
Hydraulic brakes  
Jabiru 2200A engine firewall-forward installation kit from ST Aviation  
Battery box installed in rear of fuselage in accordance with current Skycraft instructions.  
Fuel system: single fuel cock for both tanks, two-way/off tank selector valve, or single fuel cock for each tank acceptable.  
Cabin heater installation (see also Special Inspection Points below)

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

In the absence of any over-riding LAA classification, inspections and modifications published by the manufacturer should be satisfied according to the recommendation of the manufacturer. It is the owner's responsibility to be aware of and supply such information to their Inspector.

<i>Ref</i>	<i>Date</i>	<i>Description</i>
011790-02	17.01.90	Tailplane truss – fitting problem
011790-01	17.01.90	Cooling system filler cap
012390-03	23.01.90	Control linkage rod ends – safety washers
012390-04	23.01.90	Negative incidence setting on tailplane
032090-01	02.03.90	Elevator flutter – reinforced pushrod
092190-01	21.09.90	Lock rings on tail cable turnbuckles
121590	15.12.90	Reinforced G3 tail brackets
0122690-01	26.12.90	Reinforced vertical stabiliser gusset
0122690-02	26.12.90	Rudder horn and rudder travel
0101491-01	01.01.91	Reinforcement of control stick torque tube
<a href="#">00316092-01</a>	16.3.92	Landing gear sockets – loose legs
042792-01	27.4.92	Reinforced tail channel gusset – taildraggers
AA101	??????	Rotax 912 engine electrical schematic
AA105	21.9.92	Oil System Rotax 582
AA106	21.9.92	Discharging battery with Rotax 912
AA107	15.9.92	Quartz Hobbs meter
AA108	11.2.92	912 oil temperature sender
AA109	04.2.93	Aft lift strut shim
<a href="#">AD105</a>	22.6.93	Bellcrank gusset – possible control jam
OA119	27.1.95	Reinforced vertical tail spreader tube
<a href="#">AD108</a>	24.3.95	Gear leg solid doubler – add roll pin
AA121	04.4.95	Fire resistant fuel lines firewall forward
<a href="#">AD112</a>	31.7.96	Inspect taildragger cages for cracks
<a href="#">AD114</a>	10.1.97	Skylight rivets
AA125	5.96	Fuel cap venting
AA126	14.1.97	Fuel tank position dimension wrong



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AA127	31.3.97	Undercarriage mountings – doublers
AD115	25.3.98	Hegar master brake cylinders
AA133	19.2.98	Rotationally moulded fuel tank expansion
OA149	4.6.01	Two-blade Warp Drive propellers on 100 HP 912S
AD126	22.4.02	Engine mount for Rotax 912 engines
AD128	26.6.02	Aileron push pull tubes / rear lift struts
OA158	20.8.03	Nose gear disconnect & shimmy damper
<a href="#">AD130</a>	6.10.03	Improved tail spring mount & steer horns
<a href="#">AD134</a>	18.9.06	Tail spring breakage
<a href="#">AD135</a>	27.9.07	CAB-TANG failure
<a href="#">OA167</a>	14.8.08	¼" Blue fule line and 1/8" blue primer line
<a href="#">OA168</a>	23.4.09	Fuel filter
<a href="#">AD136</a>	9.7.10	Hour meter oil pressure switch leak
<a href="#">AA172</a>	16.12.10	Incorrect shipping of AAPQ-44 rivets
<a href="#">AD137</a>	7.2.11	Nose gear strut inspection
<a href="#">OA173</a>	24.5.13	Trim wire breakage
<a href="#">AA178</a>	23.12.15	Seat bottom cushion without wire pocket
<a href="#">AA179</a>	8.1.16	Incorrect sized K-1000-3 nut plate

### 3.4 Special Inspection Points

- With Rotax 912-UL engine option, the throttle spring on the carburettors must be adjusted so that the system does not have a strong tendency to spring to 'full throttle' when the throttle knob is released, or require a strong pull to keep it in the closed position.
- If Rotax engine fitted, appropriate Rotax 2-stroke or Rotax 912 series installation checklist to be completed (apart from flight test section) as part of final inspections prior to applying for Permit to Fly.
- If Rotax 912 engine fitted, a vapour return line must be fitted to the fuel system if unleaded Mogas fuel is to be used. This returns the excess fuel and vapour to the fuel tank. Returning it to the fuel supply pipe downstream of the tank outlet is not acceptable.
- Fabric life is limited, and strength can degrade quite rapidly under adverse conditions particularly on surfaces exposed to sunlight due to the absence of an UV blocker. Dacron covers deteriorate with time and lose their strength, particularly if the aircraft is tethered outside. The Bettsometer is standard device for assessing fabric strength.
- Rans state that fading of the colours on upper surfaces compared to those on the lower surfaces is a good indication that the fabric is nearing the end of its useful life, and recommend that the Dacron be replaced when its strength is reduced to half its original value. The 'Bettsometer' can be used to check the fabric strength whilst causing minimal damage to the fabric being tested. A Bettsometer reading of 1000grm or below is cause for closer inspection and perhaps rejection of the subject skin, replacement skins are available for all models.
- The instrument panel is a structural part of the fuselage frame, serving as a brace for the main fuselage uprights. Replacement instrument panels only acceptable if equally strong as standard panel. Some after-market alternative panels have been rejected on this basis. It is not acceptable to make cut-outs in the instrument panel to accept instruments larger than the standard size 3 1/8" diameter instruments unless specific modification approval has been obtained from LAA Engineering.
- Check bracing wire attachment tangs carefully for signs of cracking in service, particularly on tail bracing wires, see [MOD/204/012](#).

- Several cases have been reported of cracking in the seat back frame, particularly on early examples with pull start engines. On early examples with the tailplane mounted on the fin base root rib cracks have been found at the front tailplane attachment and rudder post. Later examples have the tailplane attached to the upper fuselage longerons and are more robust in this respect.
- Maintenance of the airframe is typical of a modern tubular aluminium microlight such as a Thruster or AX3. Watch out for bent tubes, cracks in tubing and gussets, loose rivets, signs of fretting in joints (grey metal dust stains).
- In the case of a heavy landing, check particularly carefully the cantilever main undercarriage legs, early type legs have a reputation for 'yielding' slightly and taking on a set. Later legs (which are retro-fittable) are of an improved type which are more robust. You should also check the truss-type cross-beam which the undercarriage legs fit to for signs of distortion/failure and also the bolts which attach the legs to the airframe, as the bolt holes tend to wear and consequently the legs become progressively looser in their sockets, eventually leading to wheel shimmy.
- As a microlight aircraft, a noise certificate must be issued by the CAA specific to each individual aircraft built. A new noise certificate must be obtained following any change in noise output, including change to engine type, reduction gear ratio, propeller type, propeller pitch setting, type of exhaust, exhaust after-muffler or intake silencer.
- Levelling datum: tube forming lower sill of cockpit door aperture.
- Cabin heater system: exhaust muffler shroud should be removed annually to enable a complete inspection for the muffler for cracks or other failures.

### 3.5 Special Test Flying Issues

- Some examples of the Rans S6 variants have suffered from Carbon Monoxide fumes in the cockpit. With the laced joint in the fuselage bottom covering there are inevitably multiple entry routes available for exhaust smoke into the cockpit and it relies on the airflow / pressure field around the fuselage to disperse the fumes aft rather than allowing them to seep into the cockpit. It is recommended that a CO 'dead spot' type indicator is fitted to the instrument panel. Tests have shown that the human nose is not altogether reliable in identifying the very low levels of exhaust smoke concentration involved, even when pre-mixed oil and fuel is used. If problems persist in flight an extended exhaust tailpipe may solve the problem. Later models and new replacement fuselage skins have velcro flaps covering the laced fuselage joint improving the performance and reducing drafts.
- Special attention to adequacy of rate of climb with 503 engine - minimum 250 ft/min at max gross weight. One example had to have max gross weight reduced below 430 Kg for performance reasons.
- With Jabiru engines, it is imperative that the cylinder head bolts and tappets are checked at 5, 10, 15 and 20 hours. Omitting this check can lead to head leaks and damage at around 25-50 hours. Have a good look around the rocker boxes and make sure oil is present and that there are no signs of overheating in the form of burnt lacquered oil. New engines with hydraulic tappets need only to have the head bolts checked.
- With Jabiru engines, encourage test pilot to work the engine quite hard to avoid glazed piston bores, vary rpm settings and do not fly at low power settings for too long.
- With any Rotax installations, to ensure future reliability you should go to some trouble to get the engine cooling properly set up and the propeller pitched correctly. This should give correct rpm whilst also avoiding excessive high EGTs





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which may occur not only with high throttle settings but also during the part-throttle descent when the engine is running on the 'lean part of the needle'.

- Proper co-ordinated rudder and aileron control is required, and care must be taken not to over-estimate the field performance which will be obtained using the Rotax 503 on a hot day from a short strip, especially with the aircraft fully loaded. As with any microlight, particular care is required on windy days, especially with crosswinds. The current version S6-ES, particularly when fitted with the Rotax 582, 912 or Jabiru is a significant improvement on the early models and has proven very robust in service with no real issues reported to date. The introduction of the 450 kg microlight limit has permitted later, and up-graded ESD, ESD-XL, versions to be fitted with a range of Rans options such as moulded interior kits, hydraulic brakes, Super Coyote engine cowlings etc. However, care must still be taken, particularly on Rotax 912 microlight examples, to ensure that their present maximum permitted empty weight is not exceeded.

----- END -----

Please report any errors or omissions to LAA Engineering: [engineering@laa.uk.com](mailto:engineering@laa.uk.com)