

Civil Aviation Authority United Kingdom



TYPE APPROVAL DATA SHEET

BG 02

for

Rotorsport UK MTOSport

AutoGyro Certification Ltd

(formally RotorSport UK Ltd)

Poplar Farm

Prolley Moor

Wentnor

Bishops Castle

SY9 5EJ

Applicant's Design Organisation Approval Number DAI/9917/06

Model(s): Rotorsport UK MTOSport

Revision: 12

Date of issue: 21 September 2026

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1. General

The RotorSport UK MTOSport (referred throughout as MTOSport) is a two seat (tandem configuration) gyroplane.

1.1. Manufacturer

Autogyro Certification Ltd (formally RotorSport UK Ltd)
 Poplar Farm
 Prolley Moor
 Wentnor
 Bishops Castle
 SY9 5EJ

1.2. UK Importer

N/A

1.3. Approved Configurations

The basic standard for this aircraft is defined in RotorSport UK Ltd Product Definition Document PDD-004 as approved by AAN 29247 Issue 03, plus approved modifications as described below:

- Addendum 1 [Add1]: (MC-066) Woodcomp SR3000/3 Variable Pitch Propeller
- Addendum 2 [Add2]: (MC-175) Rotorsystem II Main Rotor System
- Addendum 3 [Add3]: (MC-328) Rotorsystem II TOPP 8.4m rotor
- Addendum 4 [Add4]: (MC-318) Ivoprop DL3-68 Variable Pitch Propeller

A list of approved minor modifications is available from the RotorSport website, <https://www.autogyro.com/downloads-and-documents/> under support/aircraft compliance. Minor Modifications of relevance to this TADS are summarised below and denoted by comment where applicable:

- None

Minor modifications applicable at release-to-service are listed on the aircraft Statement of Aircraft Conformity, SAC-MTOS/xxx.

Manufacturer Serial Numbers are in the format RSUK/MTOS/XXX.

1.3.1. Powerplants

The following Powerplants are approved:

Designation	MTOSport	MTOSport
Engine Type	912 ULS	914 UL
Reduction Gear	2.43:1	2.43:1
Exhaust System	Rotax stainless steel with after muffler	Rotax stainless steel with after muffler
Intake System	Dual intake filter & Skydrive carb heat system	Single intake filter, balance box
Propeller Type	Autogyro HTC 3 blade ground adjustable, composite Woodcomp SR3000/3 in flight variable pitch [Add1] Ivoprop DL3-68 in-flight pitch adjustable [Add4]	Autogyro HTC 3 blade ground adjustable, composite Woodcomp SR3000/3 in flight variable pitch [Add1] Ivoprop DL3-68 in-flight pitch adjustable [Add4]
Propeller Dia x Pitch	HTC: 1.72m x 19.5° at 12" inwards from end of blade, with inclinometer against rear tail of aerofoil. Woodcomp SR3000/3 [Add1]: Diameter 1.7m Electrical limit stops set at 13.5deg fine to 18.5deg coarse, Checked with inclinometer on rear face of prop tip Ivoprop DL3-68 [Add4]: Diameter 68inch Pitch Variance: 13deg to 20deg nominal	HTC: 1.72m x 19.5° at 12" inwards from end of blade, with inclinometer against rear tail of aerofoil. Woodcomp SR3000/3 [Add1]: Diameter 1.7m Electrical limit stops set at 13.5deg fine to 18.5deg coarse, Checked with inclinometer on rear face of prop tip Ivoprop DL3-68 [Add4]: Diameter 68inch Pitch Variance: 13deg to 20deg nominal
Noise Type Cert No.	N/A	N/A
AAN approving configuration	AAN29247	AAN29247
Addendum	[Add1] (Optional) [Add4] (Optional)	[Add1] (Optional) [Add4] (Optional)

1.3.2. Rotor System

The following Rotor Systems are approved:

Rotor system description:	Autogyro rotor system Diameter: 8.0m End Caps: Grey	Autogyro rotor system Diameter: 8.4m End Caps: Black	Rotorsystem II Rotor Blades and Hub Diameter: 8.4m End Caps: Red Standard Rotors	Rotorsystem II Rotor Blades and Hub Diameter: 8.4m End Caps: Blue TOPP Rotors
Rotor Blade Life Limit:	700 hours	700 hours	2500 hours	2500hours
AAN approving rotor system:	AAN29247	AAN29247	AAN29247	AAN29247
Addendum:	-	-	[Add2]	[Add3]

1.4. Required Instruments

The following instruments are required to be installed with the applicable units stated.

- Airspeed Indicator (ASI): mph
- Altimeter: feet (mb subscale)
- Rotor RPM: RPM
- Engine RPM: RPM
- Compass: N/A
- Vertical Speed Indicator (VSI) (optional): Ft/min
- CT/CHT/EGT: °C
- Manifold Pressure Guage (VP Propeller only [Add1, 4]: inches Hg

1.4.1. Required Instruments for Night VMC

- N/A

1.5. Optional Equipment Installations

- 1) Lithium technology Main Aircraft battery (MC-441 – Minor Modification)
- 2) Garmin GFC 500 Autopilot (MC-430) [Add8]

2. Certification Basis

The Basis of approval of the RotorSport UK Ltd. MTOSport gyroplane is BCAR Section T, Issue 3 dated August 2005.

For aircraft equipped with the Woodcomp SR3000/3 Variable Pitch Propellers, additional requirements relating to Variable Pitch Propellers as detailed in AAN29247 Addendum 1 Special Condition 1 apply.

For aircraft equipped with the RotorSystem II TOPP (Cruise) 8.4m rotor and hub [Add3], the applicant has elected to comply with the applicable requirements in BCAR Section T issue 5 plus CAA Special Condition CRI E-01, dated 13 April 2015.

For aircraft equipped with the IVOProp DL3-68 [Add4], the applicant has elected to comply with the specific requirements for gyroplanes fitted with variable pitch propellers in BCAR Section T issue 5, dated 9 May 2013. This is accepted by CAA on the basis that the original approval basis for the aircraft did not include such requirements.

2.1. Equivalent Level of Safety Items

The following Equivalent Level of Safety (ELOS) Items have been reviewed and accepted by the CAA:

- BCAR Section T issue 3:
 - T23 – Load Distribution Limits
CG/Thrust offset varies between 2.2 and 8.8 Inches above CG. Equivalent Level of Safety and acceptable handling demonstrated by Flight test.
 - T23 – Load Distribution Limits
[Add 1, 4] CG/Thrust offset varies between 3.86 and 6.89 Inches above CG. Equivalent Level of Safety and acceptable handling demonstrated by Flight test.
 - T659 – Mass Balance
[Add 2, 3] Alternative method used for mass balance of RotorSystem II blades as described in AAN29134 (RotorSport UK Ltd MT-03). Equivalent Level of Safety reviewed and agreed with CAA
- BCAR Section T Issue 5:
 - T1935 – Blade Retention
[Add4] Blade Assembly tested to 4x the centrifugal load at max permissible rotational speed. Reviewed by CAA and demonstrated load is considered acceptable.
 - T1322 – Warning, Caution and advisory lights
[Add4] The cockpit indications for normal operation of the propeller at the limits of propeller pitch are steady amber lights (that extinguish after approx. 3secs). This has been reviewed by the CAA and considered acceptable.

2.2. Special Conditions

The following Special Conditions (SC) and/or Certification Review Items (CRI) apply:

- AAN29247 Addendum 1 Special Condition1 [Add1]
For Aircraft equipped with the Woodcomp SR3/000/3, this SC details additional requirements related to Variable Pitch Propellers not included within BCAR Section T Issue 3.
- CAA Special Condition CRI E-01: Additional Requirements for Type Certification
For aircraft equipped with the RotorSystem II TOPP (Cruise) 8.4m rotor and hub [Add3], this rotor system is used on other Light Gyroplane types which are eligible for a Certificate of Airworthiness, therefore the requirements detailed in CRI E-01 apply to this rotor head modification.

3. Technical Characteristics and Operating Limitations

3.1. Technical Characteristics

3.1.1. General

- Gyroplane with nose gear wheel chassis
- Stainless steel welded airframe with glass/carbon fibre mouldings for tail, pilot enclosure, wheel spats, and seats.
- Two-seat tandem configuration
- Main landing gear with GRP (glass fibre reinforced plastic) spring spar and Hydraulic disc brakes
- Pneumatically operated trim, rotor brake and pre-rotator.
- Extruded aluminium rotor
- Rotor head controlled with push-pull control cables
- Rudder controlled with cables
- Rudder and stabilizer surfaces made of CRP (carbon fibre)

3.1.2. Fuel Capacity

Single Tank:

Total:	35 litres
Unusable:	2 litres
Useable:	33 litres

With optional second tank:

Total:	70 litres
Unusable:	4 litres
Useable:	66 litres

Fuel specification as specified by BRP Rotax service instructions or Pilots Operating Handbook.

3.1.3. Permitted Fuels and Lubricants

Engine Oil Spec:	As specified by BRP Rotax service instructions
Gearbox oil spec:	N/A - Integral with engine
Fuel/Oil Mix:	N/A

3.1.4. Dimensions

Span:	1.82m (Not including Rotor)
Length:	5.08m (nose to tail, not including Rotor)
Height:	2.65m
Wing Area:	N/A

3.1.5. Typical Weight

Empty Weight (nominal):	
Rotax 912ULS:	250kg
Rotax 914UL:	260kg

3.2. Operating Limitations

The Aircraft must be operated in compliance with the following operating limitations.

3.2.1. Maximum Number of Occupants

Maximum number of occupants authorised to be carried (including crew): Two
 The minimum flight crew is: One pilot

3.2.2. Aerobatic Limitations

Aerobatic manoeuvres are prohibited.

Manoeuvres involving a deliberate reduction in normal 'g' shall be avoided.

Maximum bank angle 60 degrees.

3.2.3. Engine Limitations

Engine	912 ULS	914 UL
Max RPM (5 Minutes)	5,800	5,800
Max RPM (Continuous)	5,500	5,500
Max CHT (where CHT gauge fitted)	135°C	135°C
Max CT (Where CT gauge fitted)	120°C	120°C
Max EGT	N/A	N/A
Max Manifold Pressure (where Variable Pitch Propeller fitted)	N/A	T/O: 39.9in Hg Cont: 35.4inHg [Add1, 4]
Oil Pressure	Max: 7 bar Min: 0.8 bar (0-3500 rpm) 1.5 bar (above 3500 rpm) Nominal: 2-5bar	Max: 7 bar Min: 0.8 bar (0-3500 rpm) 1.5 bar (above 3500 rpm) Nominal: 2-5bar
Oil Temperature	Max: 130°C Min: 50°C	Max: 130°C Min: 50°C
Fuel Pressure	N/A	N/A

3.2.4. Air Speed Limitations

Maximum airspeed (V_{NE}): 120 mph IAS

Maximum airspeed in severe turbulence (V_B): 70 mph IAS

3.2.5. Loading Limitations

Maximum Total Weight Authorised: 500 kg
 Maximum Empty Weight (ZFW): 301 kg (912ULS)
 303 kg (914UL)
 Maximum Pilot Weight front seat: 125 kg
 Minimum Pilot Weight front seat: 60 kg
 Maximum Occupant Weight rear seat: 120 kg
 Minimum Occupant Weight rear seat: 0 kg
 Maximum total weight (both seats): 245 kg

Pilots in the front seat weighing less than 60 kg must carry suitable ballast.

The following CG limits apply:

Horizontal CG:

FWD:	600mm forward of the datum
AFT:	370mm forward of the datum
AFT:	343mm forward of the datum [Add1]

Vertical CG:

Upper:	930mm above the datum
Upper:	950mm above the datum [Add3]
Lower:	770mm above the datum

Note: The CG datum is defined as the mainwheel axle.

3.2.6. Other Limitations

Smoking in the aircraft is prohibited.

Altitude Limit: 10,000ft

Flight in icing conditions is prohibited.

Flight in strong gusty winds or wind velocities of more than 45 mph (40kts) is prohibited.

The Aircraft shall be flown by day in Visual Meteorological Conditions only.

4. Pilots Notes, Maintenance Manuals References

4.1. Approved Manuals

The following Manuals are approved for use with this aircraft (see <https://www.auto-gyro.com/>):

- (a) Pilots handbook (POH) approved for use with this aircraft is RSUK0043.
- (b) Maintenance manual approved for use with this aircraft is RSUK0044.
- (c) IVOprop manual approved for use with this aircraft is RSUK0325 [Add4]
- (d) Maintenance schedules approved for use with this aircraft are:
 - F076 – 25hr inspection
 - F138 – annual/100hr inspection
 - F093 – Aircraft Field Service Worksheet
 - F146 – short term storage and return to service
 - F141 – long term storage and return to service
 - F106 – Woodcomp Prop 25/100hr service worksheet
 - F117 – Woodcomp Prop 300hr service worksheet
 - F160 – Transponder Test

4.2. Placards

Placards to be installed in accordance with the applicable POH:

- RSUK0043

The following placards are mandatory:

- a) Smoking in the aircraft is prohibited.
- b) Occupant Warning: This aircraft has not been certificated to an International Requirement
- c) Limitations as per Permit to Fly
- d) Permanent & fireproof attachment of aircraft registration no & aircraft serial no. (plate affixed to instrument panel)

5. Notes

1. Two versions of the MTOSport have been produced. The MTOSport 2017 is described in TADS BG-08. On the Auto-Gyro website, the original MTOSport is described as the MTOSport 2010.
2. A documentation error was identified in the Airworthiness Approval Note (AAN) and associated Addendums during the update of this TADS from issue 11 to 12.

The Addendum for the IVOProp DL3-68 variable Pitch Propellor was originally raised as AAN 29247 Addendum 3, however it was recorded as AAN 29247 Issue 3 Addendum 1, thus creating two Addendum 1's.

Subsequently, the Rotorsystem II TOPP (Cruise) rotor and hub was raised as AAN29247 Addendum 3.

To rectify this administrative error, the IVOProp DL3-68 Variable Pitch Propeller AAN Addendum has been re-issued as Addendum 4.

6. Document Administration

6.1. Document History

Issue No.	Date.	Changes
1	22 Apr 2009	Initial issue
2	18 Dec 2009	Correction to wind speed limitation under item 8G, update to the optional modifications listing under Annex B and addition of Woodcomp SR3000/3 Variable Pitch propeller option.
3	28 Jun 2010	Correction to horizontal CG limits under item 8B. Updated optional modifications listing.
4	16 Jul 2010	The location of the aircraft registration markings has been clarified. The 12V auxiliary socket placard/engraved wording has been clarified under Appendix D.
5	13 Jan 2011	Correction of unusable fuel under section 8I following discussion with Rotorsport.
6	23 Feb 2011	Update to section 11.1, Manuals approved for use with this aircraft.
7	31 May 2011	Addition of limitation for gyroplane training under section 8H. Updated mods listing under Annex B.
8	12 Jul 2011	Update to section 11.1b) Maintenance Manual and section 11.1c) 100 hour/Annual Inspection schedule approved for use with this aircraft.
9	15 Sep 2011	Addition of Rotorsystem II option under section 7, update to section 11.1 manuals approved for use with this aircraft, update to Appendix B Optional Modifications and Update to Appendix D Placards.
10	06 Oct 2015	Addition of Ivoprop DL3-68.
11	Date of Issue not recorded	Changes not recorded
12	See Date of Issue	Administrative Only – Document format update Correction of administrative error relating to AAN Addendum numbers (See Note 2). Standardisation of terminology across TADS, AANs and Permit to Fly. Removal of operational statement on use of Gyroplanes for aerial work, as covered by enduring permission under ORS4 No.1583. Correction of administrative error covering AAN Addendum for the IVOProp DL3-68 Variable Pitch Propeller. Section 5 notes added.

6.2. Abbreviations & Definitions

Term	Definition
[]	Addendums noted in square brackets are modifications which may be listed or removed on Permit to Fly limitations as per aircraft configuration.
AAN	Airworthiness Approval Note – Original approving document for type
Add(x)	Addendum to AAN
ASI	Air Speed Indicator
CHT	Cylinder Head Temperature
CRI	Certification Review Item
CT	Coolant Temperature
EFD	Electronic Flight Display
EGT	Exhaust Gas Temperature
ELOS	Equivalent Level of Safety
IAS	Indicated Air Speed
MTOW	Maximum Take Off Weight
MTWA	Maximum Total Weight Authorised
N/A	Not Applicable
PFD	Primary Flight Display
RPM	Revolutions per Minute
SC	Special Condition
Severe Turbulence	Large, abrupt changes in altitude or attitude. Aircraft may be temporarily out of control.
V _B	Design speed for maximum gust intensity
V _{MIN}	Minimum Airspeed
V _{NE}	Never Exceed Speed
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions