



evektor

Pilot's Operating Handbook

for

SportStar^{RTC}

Airplane Type:	SportStar
Model:	RTC
Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Type Certificate Number:	EASA.A.592
Publication Number:	ERTC020-10-AS
Date of Issue:	29.2.2012

This Manual must be on the airplane board during its operation. This POH contains information required to be furnished to the pilot by the CS-LSA, ASTM F 2746-9 regulation and supplementary information provided by the holder of TC – Evektor, spol. s r.o.

Pages marked as "EASA Approved" are approved by European Aviation Safety Agency.

Signature:



26. MAI 2012

Date of Approval:

This airplane must be operated in compliance with the information and limitations stated in this Manual.

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Airplane manufacturer:
EVEKTOR-AEROTECHNIK, a.s.
686 04 Kunovice – Letecká 1394
Czech Republic

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Annexe 1



Cet intercalaire doit obligatoirement être inséré
devant la page de garde d'un manuel de vol en
langue anglaise

AVERTISSEMENT


Le présent document en langue anglaise est le manuel de vol approuvé par l'Agence européenne de la sécurité aérienne.

En application des dispositions de l'arrêté du 24 juillet 1991 relatif aux conditions d'utilisation des aéronefs civils en aviation générale (« Un vol ne peut être entrepris que si, d'une part les membres d'équipage sont familiarisés avec l'aéronef et son équipement de bord, notamment le matériel de sécurité-sauvetage et les systèmes spéciaux, et d'autre part ont une connaissance pratique de son manuel de vol ou des documents acceptés comme équivalents. »).

Nul ne peut utiliser l'aéronef avec ce seul document s'il n'a pas une connaissance suffisante de la langue anglaise.

A défaut, il appartient au propriétaire ou à l'exploitant de l'aéronef de se procurer une traduction de ce document sous sa responsabilité.

Référence : Instruction du 13/11/2009 relative à la langue des manuels de vol

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0 Technical Information

0.1 Introduction

This Manual is valid only for SportStar RTC airplane with serial number and registration number shown on the cover page.

This Manual may not be used for airplane operation if it is not keep up to date.

0.2 Warnings, Cautions, Notes

WARNING

MEANS THAT NON-OBSERVATIONS OF THE CORRESPONDING PROCEDURE LEADS TO AN IMMEDIATE OR IMPORTANT DEGRADATION OF THE FLIGHT SAFETY.

CAUTION

MEANS THAT NON-OBSERVATIONS OF THE CORRESPONDING PROCEDURE LEADS TO A MINOR OR TO A MORE OR LESS LONG TERM DEGRADATION OF THE FLIGHT SAFETY.

NOTE

Draws the attention to any special item not directly related to safety but which is important or unusual.



0.3 Log of Revisions

All revisions or supplements to this Manual, except actual weighing data, are issued in form of revisions, which will have new or changed pages as an appendix and the list of which is shown in the Log of Revisions table.

NOTE

It is airplane operator's responsibility to keep this Manual up to date.

Rev. No.	Affected Pages	Description	EASA Appr./ Date	Inserted by / Date
1	0-2, 0-4, 0-6 2-12, 2-13 7-6, 7-7, 9-3	Minor corrections: placards and instrument panel layout.	Approved under DOA No. EASA.21J.57	Evektor 2012-08-08
2	0-2, 0-4, 0-6 9-3	Added Supplement No. 16 into the List of Supplements.	Approved under DOA No. EASA.21J.57	Evektor 2013-06-04
3	0-2, 0-4, 0-5, 0-6 1-3, 1-7, 2-10, 2-5, 2-6, 2-7, 2-11 3-4, 3-5, 3-6, 3-7, 3-8, 3-10 4-5, 4-6, 4-9, 4-14, 4-15 5-21, 7-1, 7-2, 7-5, 7-6, 7-7, 7-8, 7-16, 9-3	Minor corrections: typos, oil quantity, added description of wing flaps control and parking brake operation, added supplements No. 14, 17, 18 and 19 into List of Supplements, added max. empty weight.	Approved under DOA No. EASA.21J.57	Evektor 2014-03-17
4	0-2, 0-4, 0-6 2-5, 2-6 7-7, 7-9 9-3	Incorporation of Rotax service bulletin SB-912-066 and adding supplements to List of Inserted Supplements in Section 9.	Approved under DOA No. EASA.21J.57	Evektor 2015-02-27
5	0-2, 0-4, 0-5, 0-6 2-1, 2-5, 2-11, 2-12, 2-13 4-8, 4-10, 4-11, 4-14, 4-15 7-4, 7-5, 7-6, 7-7 9-3	Incorporation of the new adjustable foot pedals. Added limitation of electrical system and supplements No. 22 and 23 into List of Supplements, minor corrections.	Approved by EASA under AFM approval No. 10057270	Evektor 2016-03-24
6	0-2, 0-4, 0-6, 2-5, 2-12, 7-1 through 7-30 9-3, 9-4	Clarified engine idle RPM. Rewritten section 7. Added supplements No. 25 and 26 into List of Suppl.	Approved under DOA No. EASA.21J.57	



Rev. No.	Affected Pages	Description	EASA Appr./ Date	Inserted by / Date
7	0-3, 0-4, 0-6, 9-4, 9-5	Added supplements No. 27, 28 and 29 into List of Suppl.	Approved under DOA No. EASA.21J.57	Evektor 2018-01-02



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Technical Information



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1.1 Introduction

This POH contains information required to be furnished to the pilot by the CS-LSA regulation, ASTM F 2746-09 and supplementary information provided by the TC holder – EVEKTOR, spol. s r.o.

The pilot is obliged to become familiar with all content of this Manual including supplements located in Section 9.

1.2 Certification Basis

This airplane meets following ASTM standards:

- F2245-10c Design and Performance of a Light Sport Airplane
- F2483-05 Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft
- F2746-09 Standard Specification for Pilot's Operating Handbook (POH) for Light Sport Airplane
- F2339-06 Design & Manufacture of Reciprocating Spark Ignition Engines
- F2506-07 Design and Testing of Fixed-Pitch or Ground Adjustable Propellers
- F2538-07a Design & Manufacture of Reciprocating Compression Ignition Engines
- F2316-08 Airframe Emergency Parachutes for Light Sport Aircraft

This type of airplane was approved by the European Aviation Safety Agency (EASA) in accordance with the CS-LSA regulation.

Type certificate Number:	EASA.A.592
Date:	24.5.2012
Basis of Noise Certificate:	ICAO Annex 16, Volume 1

1.3 Airplane Manufacturer

EVEKTOR-AEROTECHNIK, a.s.

Letecká 1384

686 04 Kunovice

Czech Republic

Tel.: +420 572 537 111

Fax: +420 527 537 900

e-mail: marketing@evektor.cz

www.evektoraircraft.com



1.4 Descriptive Data

1.4.1 Airplane Description

SportStar RTC airplane is a low-wing with two side by side seats and nose wheel landing gear. Airplane structure is a metal with high portion of composite materials used.

For further description see Section 7 - Airplane & System Description.

1.4.2 Power Plant

The standard power plant consists of ROTAX 912 ULS engine and WOODCOMP Klassic 170/3/R propeller.

For further description see Section 7 - Airplane & System Description.

1.4.3 Main Technical Data

Wing

Span	8.646 m
Area	10.6 sq.m
MAC depth	1.25 m
Wing loading	56.60 kg/sq.m
Aileron – area	0.25 sq.m
Flap – area	0.52 sq.m

Fuselage

Length	5.980 m
Width	1.082 m
Height	2.476 m
Cockpit canopy max. width	1.180 m

Horizontal tail units

Span	2.50 m
HTU area	1.95 sq.m
Elevator area	0.80 sq.m



Vertical tail units

Height	1.39 m
VTU area	1.05 sq.m
Rudder area	0,43 sq.m

Landing gear

Wheel track	1.95 m
Wheel base	1.35 m
Main and nose landing gear wheel diameter	380 mm



1.4.4 Three View Drawing

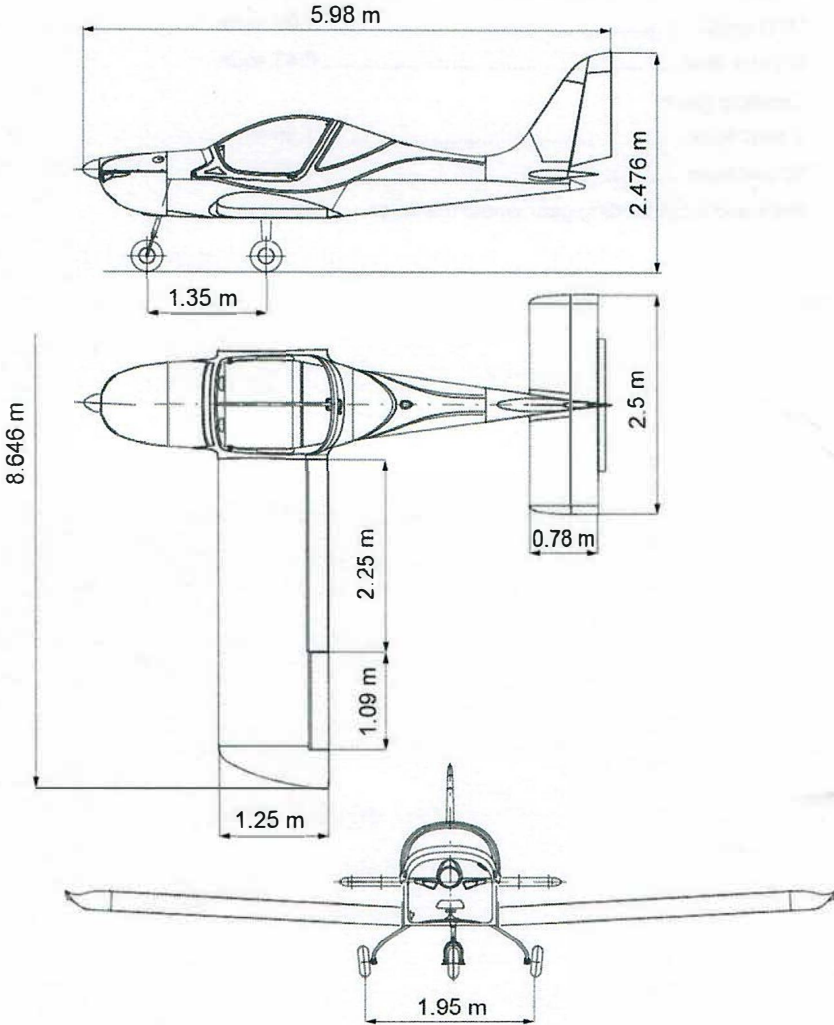


Figure 1-1



1.5 Airplane Performance Specifications

1.6 Weight

Maximum take-off weight 600 kg

1.7 Airspeeds and Performance

Top speed (0 ft ISA, MTP)..... 114 KIAS (212 km/h IAS)

Cruise speed (2000 ft ISA, 75% MCP)..... 92 KIAS (171 km/h IAS)

Maximum range (2000 ft ISA, 75% MCP) 1180 km

Best rate-of-climb speed V_Y :

- Flaps retracted – 0° 65 KIAS (120 km/h IAS)
- Flaps in take-off position – 15° 61 KIAS (113 km/h IAS)

Best angle-of-climb speed V_X :

- Flaps retracted – 0° 49 KIAS (90 km/h IAS)
- Flaps in take-off position – 15° 48 KIAS (88 km/h IAS)

Stall speeds in horizontal flight:

- Flaps retracted – 0° 42 KIAS (78 km/h IAS)
- Flaps in take-off position – 15° 41 KIAS (76 km/h IAS)
- Flaps in landing position I – 30° 40 KIAS (75 km/h IAS)
- Flaps in landing position II – 50° 39 KIAS (73 km/h IAS)

1.8 Fuel

Total fuel capacity 120 l

Total usable fuel 118 l

Automotive gasoline with octane index min. RON 95 (or anti-knock index min.

AKI 91) meets the following standards:

- Europe – EN 228 Super, EN 228 Super plus
- Canada – CAN/CGSB-3.5 Quality 3
- USA – ASTM D4814
- Russia - R51866-2002

Aviation gasoline:

- AVGAS 100 LL aviation fuel according to ASTM D910.
- AVGAS UL91 (unleaded) aviation fuel according to ASTM D7547.



1.9 Engine

Max. take-off power (5 minutes).....73.5 kW (100 hp) at 5800 RPM

Max. continuous power69 kW (93 hp) at 5500 RPM

1.10 Definitions and Abbreviations

NOTE

The abbreviations on placards in the airplane cockpit are printed in **BOLD CAPITAL LETTERS** in the text of this Airplane Flight Manual.

ACCU	Accumulator
AKI	Anti knock index of fuel
ALT ENC	Encoding altimeter
AOA	Angle of attack
ATC	Air traffic control
bar	1 bar = 100 kPa
°C	Celsius degree
CAS	Calibrated airspeed
ELT	Emergency locator transmitter
fpm	Foot per minute
ft	Foot/feet (1 ft = 0.305 m)
GEN	Generator
GPS	Global positioning system
IAS	Indicated airspeed
IC	Intercom
IFR	Instrument flight rules
ISA	International standard atmosphere
kg	Kilogram
KIAS	Indicated airspeed in knots
km/h	Kilometers per hour
kt, kts	Knot, knots (1 kt = 1.852 km/h)
l	Liter
lb, lbs	pound/pounds (1 lb = 0.453 kg)
m	Meter
MAC	Mean aerodynamic chord



max.	Maximum
MCP	Maximum continuous power
min.	Minimum / minute
mm	Millimeter
m/s	Meter per second
MTP	Maximum take-off power
nm	Nautical mile (1 nm = 1.852 km)
OAT	Outside air temperature
OFF	System is switched off or control element is in off position
ON	System is switched on or control element is in on position
Pa	Pascal (1 Pa = 1 N/sq.m)
PSI	Pound per sq.in (1 PSI = 6.89 kPa)
POH	Pilot's Operating Handbook
RON	Research octane number
RPM	Revolutions per minute
RWY	Runway
sq.ft	Foot squared
sq.in	Inch squared
sq.m	Meter squared
U.S. gall	U.S. gallons (1 U.S. gall = 3.785 l)
V _A	Maneuvering speed
V _C	Design cruising speed
V _{FE}	Maxim flap extended speed
VFR	Visibility flight rules
V-METER	Voltmeter
V _{NE}	Never exceed speed
V _{NO}	Maximum structural cruising speed
V _{S0}	Stall speed with flaps in 50° position
V _{S1}	Stall speed with flaps in 0° position
VTU	Vertical tail units
V _X	Best angle of climb speed
V _Y	Best rate of climb speed
XPDR	Transponder



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2.1 Introduction

Section 2 contains operation limitation, instrument marking and basic placards necessary for safe operation of airplane and its engine, standard systems and equipment. Limitation for optional systems and equipment are stated in section 9 - Supplements.

2.2 Airspeed Limitation

Airspeed limitations and their meaning for operation are stated in the table below:

Airspeed		KIAS	km/h IAS	Meaning
V _{NE}	Never exceed speed	146	270	Do not exceed this speed in any operation.
V _C	Design cruising speed	115	214	Do not exceed this speed, with exception of flight in smooth air, and even then only with increased caution.
V _A	Design maneuvering speed	90	167	Do not make full or abrupt control movement above this speed, because under certain conditions the airplane may be overstressed by full control movement.
V _{FE}	Maximum flap extended speed	70	130	Do not exceed this speed with the given flap setting.
V _{SO}	Stall speed	39	73	Flaps in 50° position at maximum take-off weight.



2.3 Airspeed Indicator Marking

Airspeed indicator markings and their color-code significance are shown in the table below:

Marking	Range		Meaning
	KIAS	km/h IAS	
Red line	39	73	V_{S0} at maxim weight (flaps in landing position 50°)
White arc	39 – 70	73 - 130	Operating range with extended flaps. Lower limit - V_{S0} at maximum (flaps in landing position 50°) Upper limit - V_{FE}
Green arc	42 - 115	78 - 214	Normal operating range Lower limit - V_{S1} at maximum weight (flaps retracted - 0°) Upper limit - V_C
Yellow arc	115 – 146	214 - 270	Maneuvers must be conducted with caution and only in smooth air
Red line	146	270	Maximum speed for all operations - V_{NE} .

**2.4 Power Plant**

Engine manufacturer:	BRP-Powertrain GmbH & Co KG	
Engine type:	ROTAX 912 ULS	
Power:	max. take-off	73.5 kW / 100 HP
	max. continuous	69.0 kW / 93 HP
Engine speed:	max. take-off	5800 RPM max. 5 minutes
	max. continuous	5500 RPM
	idle	min. 1400 RPM
Cylinder head temperature:	maximum	128°C / 262 °F see Note on page 2-6
Coolant temperature:	maximum	120°C / 248 °F see Note on page 2-6
Oil temperature:	maximum	130°C / 266 °F
	optimum operation	90 - 110°C / 190 - 230°F
Oil pressure:	maximum	102 PSI / 7 bar (for short period admissible at cold start)
	minimum	0.8 bar / 12 PSI
	optimum operation	2 - 5 bar / 29 - 73 PSI
Fuel pressure:	maximum	5.8 PSI / 0.4 (0.5*)bar
	minimum	2.2 PSI / 0.15 bar
Fuel grades:	see para 2.13.2 Approved Fuel Grades	
Oil grades:	see para 2.14 Oil Limits	
Engine start, operating temperature		
	maximum	50°C / 120°F (ambient temperature)
	minimum	-25°C / -13°F (oil temperature)
Propeller manufacturer:	WOODCOMP s.r.o.	
Propeller type:	KLASSIC 170/3/R 3-blade, composite, on-ground adjustable	
Propeller diameter:	1712 mm / 68 in	
Propeller blade pitch:	17°30'	

* Applicable only for fuel pump from S/N 11.0036



NOTE

The coolant temperature (instead of CHT) is measured on engines from S/N 6 781 410 inclusive or on engines equipped with cylinder heads of P/N 413185 (cylinder head position 2/3) and 413195 (cylinder head position 1/4).

2.5 Power Plant Instrument Marking

The color-code of instruments is shown in the following table:

Instrument	Units	Red line	Green arc	Yellow arc	Red line
		Lower limit	Normal operation range	Caution range	Upper limit
RPM indicator	RPM	-	1400 - 5500	5500 - 5800	5800
Oil temperature indicator	°C	-	90 - 110	50 - 90 110 - 130	130
	°F	-	190 - 230	120 - 190 230 - 266	266
Oil pressure indicator	bar	0,8	2 - 5	0,8 - 2 5 - 7	7
	PSI	12	29 - 73	12 - 29 73 - 102	102
Fuel pressure	bar	0.15	0.15 - 0.4 (0.5*)	-	0.4 (0.5*)
	PSI	2.2	2.2 - 5.8	-	5.8
Cylinder head temperature see Note above	°C	-	-	-	128
	°F	-	-	-	262
Coolant temperature see Note above	°C	-	-	-	120
	°F	-	-	-	248

* Applicable only for fuel pump from S/N 11.0036

2.6 Miscellaneous Instrument Marking

There are no other instruments with color marking.



2.7 Weight Limits

- Maximum empty weight.....405 kg
- Maximum take-off weight600 kg
- Maximum landing weight600 kg
- Maximum weight in baggage compartment.....25 kg

2.8 Centre of Gravity

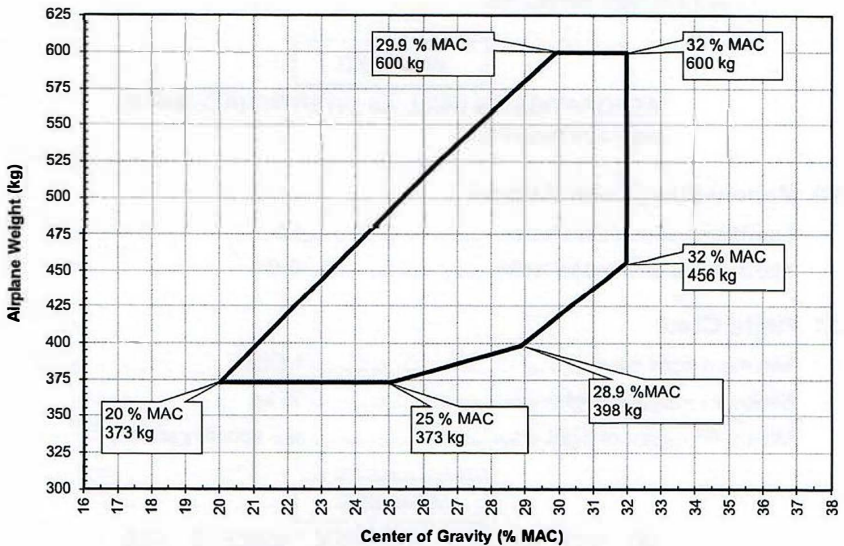


Figure 2-1 Centre of gravity

Reference datum is the wing leading edge.

WARNING

DO NOT EXCEED MAXIMUM WEIGHTS AND LIMITATION OF CENTER OF GRAVITY! THEIR EXCEEDING LEADS TO AIRPLANE OVERLOADING AND TO DEGRADATION OF FLIGHT CHARACTERISTICS AND DETERIORATION OF MANOEUVRABILITY.



2.9 Approved Maneuvers

SportStar RTC airplane is approved to perform the following maneuvers:

- Steep turns up to bank of 60°
- Climbing turns
- Lazy eights
- Stall (except for steep stalls)
- Normal flight maneuvers

WARNING

**AEROBATICS AS WELL AS INTENTIONAL SPINS
ARE PROHIBITED!**

2.10 Maneuvering Load Factors

Maximum positive load factor4.0

Maximum negative load factor-2.0

2.11 Flight Crew

Minimum flight crew..... 1 pilot

Minimum weight of flight crew 55 kg

Maximum weight of flight crew see sec. 6, para 6.3

WARNING

**DO NOT EXCEED MAXIMUM WEIGHTS AND
LIMITATION OF CENTER OF GRAVITY! THEIR
EXCEEDING LEADS TO AIRPLANE
OVERLOADING AND TO DEGRADATION OF
FLIGHT CHARACTERISTICS AND
DETERIORATION OF MANOEUVRABILITY.**



2.12 Kind of Operation

The airplane is standardly approved for VFR daylight flights.

WARNING

NIGHT FLIGHTS ACCORDING TO VFR, FLIGHTS ACCORDING TO IFR AND INTENTIONAL FLIGHTS UNDER ICING CONDITIONS ARE PROHIBITED.

Instruments and equipment for daylight flights according to VFR:

- 1 Airspeed indicator (the color marking according to para 2.3)
- 1 Sensitive barometric altimeter
- 1 Magnetic compass
- 1 Fuel gauge indicator for each fuel tank
- 1 Oil temperature indicator
- 1 Oil pressure indicator
- 1 Cylinder head temperature indicator
- 1 Engine speed indicator
- 1 Safety harness for every used seat

CAUTION

ADDITIONAL EQUIPMENT NECESSARY FOR AIRPLANE OPERATION IS GIVEN IN APPROPRIATE OPERATION REGULATION OF AIRPLANE OPERATOR'S COUNTRY.



2.13 Fuel Limits

2.13.1 Fuel Capacity

Fuel tank capacity (each)	60 l
Total fuel capacity	120 l
Total usable fuel	118 l
Total unusable fuel	2 l (1 l per tank)

NOTE

It is not recommended to fully tank the fuel tanks. Due to fuel thermal expansions keep about 8.0 liters of free space in the tank to prevent fuel bleed through the vents in the wing tips. This should be adhered especially when cold fuel from an underground tank is tanked.

2.13.2 Approved Fuel Grades

Automotive gasoline with octane index min. RON 95 (or anti-knock index min. AKI 91) meets the following standards:

- Europe – EN 228 Super, EN 228 Super plus
- Canada – CAN/CGSB-3.5 Quality 3
- USA – ASTM D4814
- Russia - R51866-2002

Aviation gasoline:

- AVGAS 100 LL aviation fuel according to ASTM D910.
- AVGAS UL91 (unleaded) aviation fuel according to ASTM D7547.

CAUTION

APPROVED AND UP TO DATE FUEL GRADES ARE STATED IN THE ACTUAL ISSUE OF SERVICE INSTRUCTION SI-912-016.



NOTE

AVGAS 100 LL places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and leads sediments in the oil system. Thus it should only be used when automotive gasoline is unavailable.

Risk of vapor formation if using winter fuel for summer operation.

2.14 Oil Limits

Performance classification SG or higher according to API.

Oil volume:

- minimum 2.5 l (min. mark on the dip stick)
- maximum 3.0 l (max. mark on the dip stick)

CAUTION

RECOMMENDED OIL GRADES ARE STATED IN THE ACTUAL ISSUE OF SERVICE INSTRUCTION SI-912-016.

2.15 Maximum Number of Passengers

Maximum number of passengers including pilot.. 2

2.16 Electrical System Limitations

SOCKET and **BEACONS** switches must be in **OFF** position during taxiing.

SOCKET switch must be in **OFF** position during landing.

2.17 Other Limitations

SMOKING IS PROHIBITED on the airplane board.



2.18 Limitation Placards

The following placards are located on the titling canopy:

This Light Sport Aircraft has been approved only for VFR day flights under no icing conditions.		This Light Sport Aircraft has been approved only for VFR day flights under no icing conditions.				
Aerobatics and intentional spins are prohibited!		Aerobatics and intentional spins are prohibited!				
<p style="text-align: center;">AIRSPED IAS</p> Never exceed V_{ne} 146 kts Design Manoeuvring V_a 90 kts Max. Flap Extended V_{fe} 70 kts Stalling V_{st} 39 kts		<p style="text-align: center;">AIRSPED IAS</p> Never exceed V_{ne} 270 km/h Design Manoeuvring V_a 167 km/h Max. Flap Extended V_{fe} 130 km/h Stalling V_{st} 73 km/h				
<p style="text-align: center;">ENGINE SPEED</p> Max. Take-off (max. 5 min.) 5800 rpm Max. Continuous 5500 rpm Min. Idling 1400 rpm		<p style="text-align: center;">ENGINE SPEED</p> Max. Take-off (max. 5 min.) 5800 rpm Max. Continuous 5500 rpm Min. Idling 1400 rpm				
Unusable quantity of fuel 2 litres		Unusable quantity of fuel 2 litres				
LOAD LIMITS						
Max. take-off weight		600 kg				
Empty weight		335 kg				
Max. baggage weight		25 kg				
PERMITTED CREW WEIGHT [kg]						
Fuel quantity ltr.		120	100	75	50	25
Baggage weight	max. 25 kg	154	168	186	204	222
	1/2 12 kg	167	181	199	217	235
	baggage	179	193	211	229	247
Fuel reserve (1/8 on the fuel indicator)		8 litres				

The following placards are located on the instrument panel



BEFORE TAKE-OFF PUSH CANOPY HANDLE UP
TO CHECK CANOPY FULL CLOSING

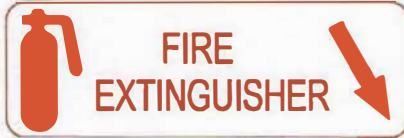
Placard color: red.



The following placards are located in the baggage compartment:



Placard color: green.



Placard color: red.

The following placard is located on the left and right side of the canopy frame:



NOTE

Other placards and labels are shown in Airplane Maintenance Manual for SportStar RTC airplane.



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3.1 Introduction

Section 3 describes operations and procedures for emergency situation solutions that could possibly occur during airplane operation.

3.2 Speeds for Performing Emergency Procedures

Airspeed for the best gliding ratio (flaps retracted)	59 KIAS (110 km/h IAS)
Airspeed for the best gliding ratio (flaps in TAKE-OFF position – 15°).....	57 KIAS (106 km/h IAS)
Precautionary landing (engine running, flaps in LANDING I position – 30°).....	57 KIAS (105 km/h IAS)
Precautionary landing (engine running, flaps in LANDING II position – 50°).....	54 KIAS (100 km/h IAS)
Emergency landing (engine stopped, flaps in LANDING I position – 30°).....	56 KIAS (105 km/h IAS)
Emergency landing (engine stopped, flaps in LANDING II position – 50°).....	54 KIAS (100 km/h IAS)



3.3 Engine Failure

3.3.1 Engine Failure at Take-off Run

1. **THROTTLE** lever idle
2. Brakes as necessary
3. **FUEL** selector **OFF**
4. Ignition **OFF**
5. **MASTER SWITCH** **OFF**

3.3.2 Engine Failure at Take-off

1. Push the control stick to get the airplane to gliding.
2. Gliding speed:
 - Flaps in **TAKE-OFF** position (15°) min. 57 KIAS (106 km/h IAS)
 - Flaps retracted (0°) min. 59 KIAS (110 km/h IAS)
3. **THROTTLE** lever idle
4. Flaps as needed
5. **FUEL** selector **OFF**
6. Ignition **OFF**
7. **MASTER SWITCH** **OFF**
8. After touch down brake as needed

3.3.3 Engine Failure in Flight

1. Gliding speed 59 KIAS (110 km/h IAS)
2. Altitude take a decision and carry out:
 - Engine starting in flight – see para 3.4
 - Emergency landing – see para 3.9.1



3.4 Engine Starting in Flight

NOTE

It is possible to start the engine by means of the starter within the whole range of operation speeds as well as flight altitudes. The engine is started up after switching the ignition to **START** position.

If the engine is shut down, the altitude loss during engine starting can reach up to 1000 ft.

1. Gliding speed 59 KIAS (110 km/h IAS)
2. Altitude check
3. **MASTER SWITCH** **ON**
4. Unnecessary electrical equipment **OFF**
5. **FUEL** selector **LEFT** or **RIGHT**
6. **CHOKE** as needed
7. **THROTTLE** lever idle (choke open)
increased idle (choke closed)

The propeller is rotating:

8. Ignition **BOTH**

The propeller is not rotating:

9. Ignition **START**
10. If engine starting does not occur, increase gliding speed up to 108 KIAS (200 km/h IAS), so that air-flow turns the propeller and engine will start.
11. Ignition **BOTH**
12. If engine starting is unsuccessful, then continue according to para 3.9.1 Emergency Landing – with Non-operating Engine.



3.5 Engine Fire

3.5.1 Fire on the Ground

1. **FUEL** selector **OFF**
2. Brakes brake
3. **THROTTLE** lever full
4. **HOT AIR** knob close
5. **COLD AIR** knob close

After the engine stops:

6. Ignition **OFF**
7. **MASTER SWITCH** **OFF**
8. Airplane leave
9. Portable extinguisher use

3.5.2 Fire at Take-off

1. **FUEL** selector **OFF**
2. **THROTTLE** lever full
3. **HOT AIR** knob close
4. **COLD AIR** knob close
5. Gliding speed 57 KIAS (106 km/h IAS)
6. Ignition **OFF**
7. Land
8. **MASTER SWITCH** **OFF**
9. Airplane leave
10. Portable extinguisher use

3.5.3 Fire in Flight

1. **FUEL** selector **OFF**
2. **THROTTLE** lever full
3. **HOT AIR** knob close
4. **COLD AIR** knob close
5. Gliding speed 59 KIAS (110 km/h IAS)
6. Ignition **OFF**



7. MASTER SWITCH OFF

NOTE

For extinguishing the engine fire, you can perform slip under assumption that you have sufficient altitude and time.

If you manage to extinguish the engine fire, then it is possible to switch on the **MASTER SWITCH** again. You will switch all the section switches and after switching on the **MASTER SWITCH** the electrical system is switched on which is necessary to complete the flight.

WARNING

NEVER START THE ENGINE AGAIN!

- 8. ATCreport, if possible
- 9. Emergency landingcarry out according to para 3.9.1
- 10. Airplaneleave
- 11. Portable extinguisheruse

3.6 Fire in the Cockpit

- 1. Fire sourceidentify
- 2. **MASTER SWITCH** in case that the source of fire is electrical equipment..... **OFF**
- 3. Portable extinguisheruse
- 4. After extinguishing the fire.....aerate the cockpit
- 5. Carry out Precautionary landing according to para 3.9.2

WARNING

NEVER SWITCH ON THE DEFECTIVE SYSTEM AGAIN.

NOTE

If a defective electrical system circuit was detected as the fire source, then switch off appropriate circuit breaker and switch over **MASTER SWITCH** to **ON** position.



3.7 Emergency descent

1. **THROTTLE** lever idle
2. Flaps.....**RETRACTED** position (0°)
3. Airspeedmax. V_{NE}
146 KIAS (270 km/h IAS)

3.8 Gliding Flight

NOTE

Gliding flight can be used for example in case of engine failure.

Wing flaps position	Retracted (0°)	Take-off (15°)
Airspeed	59 KIAS (110 km/ IAS)	57 KIAS (106 km/h IAS)

3.9 Emergency Landing

3.9.1 Emergency Landing – with Non-operating Engine

1. Airspeed 59 KIAS (110 km/h IAS)
2. Landing areachoose,
determine wind direction
3. Safety harnesstighten up
4. Flaps:
 - **LANDING I** position (30°).....57 KIAS (105 km/h IAS)
 - **LANDING II** position (50°).....54 KIAS (100 km/h IAS)
5. ATC notify situation, if possible
6. **FUEL** selector**OFF**
7. Ignition.....**OFF**
8. **MASTER SWITCH****OFF** before touch down



3.9.2 Precautionary Landing – with Engine Operating

1. Area for landingchoose, determine wind direction, carry out passage flight with speed of 57 KIAS (106 km/h IAS) flaps in take-off position (15°)
2. ATCnotify situation, if possible
3. Safety harnesstighten up
4. Flaps:
 - **LANDING I** position (30°) 57 KIAS (105 km/h IAS)
 - **LANDING II** position (50°) 54 KIAS (100 km/h IAS)
5. Landing..... carry out

3.9.3 Landing with Burst Tire

CAUTION

WHEN LANDING AT HOLDING, KEEP THE WHEEL WITH BURST TIRE ABOVE THE GROUND AS LONG AS POSSIBLE BY MEANS OF AILERONS. IN CASE OF NOSE WHEEL BY MEANS OF ELEVATOR.

1. At running hold airplane direction by means of foot control and elevator.

3.9.4 Landing with Damaged Landing Gear

1. In case of nose landing gear damage touch down at the lowest possible speed and try to keep the airplane on main landing gear wheels as long as possible.
2. In case of main landing gear damage touch down at his lowest possible speed and if possible keep direction at running.



3.10 Unintentional Spin Recovery

NOTE

The airplane has not, when using normal techniques of pilotage, tendency to go over to spin spontaneously.

Standard procedure of recovery from spin:

1. Flaps.....retract – 0°
2. **THROTTLE** lever idle
3. Control stick.....ailerons - neutral position
4. Pedals kick the rudder pedal push against spin rotation direction
5. Control stick push forward at least to middle position as minimum and hold it there until rotation stops
6. Pedals immediately after rotation stopping, set the rudder to neutral position
7. Control stick..... by gradual pulling recover the diving

CAUTION

ALTITUDE LOSS PER ONE TURN AND RECOVERING FROM THE SPIN IS 500 UP TO 1000 FT.

3.11 Low Oil Pressure

1. Oil pressure indicator check
2. **THROTTLE** lever min. necessary power
3. Perform Precautionary landing – see para 3.9.2

3.12 Generator Failure

Failure of generator is signaled by switching on the red signaling light **CHARGING** on the left side of the instrument panel.

1. **GEN** circuit breaker **PULL** and then **PUSH**

If the red signaling light **CHARGING** is still on:

2. **GEN** circuit breaker **PULL**
3. Decrease consumption of electric energy by switching off instruments and other electrical appliances which are not necessary for safety flight.



3.13 Unintentional Flight in Icing Conditions

1. **CARBURET. PREHEAT.** knob **ON**
2. Heating.....direct the hot air toward canopy glazing
3. Icing area.....leave immediately

3.14 Other Emergency Procedures

3.14.1 Failure of Lateral Control

1. Control the airplane in lateral direction by means of the rudder.
2. **THROTTLE** leveradjust power as needed
3. Land on the nearest suitable airport or in case of need carry out Precautionary landing - see para 3.9.2

3.14.2 Failure of Longitudinal Control

1. Control the airplane in longitudinal direction by means of elevator trim tab and by changing the engine power.
2. Land on the nearest suitable airport or in the case of need carry out Precautionary landing - see para 3.9.2

3.14.3 Failure of Trim Tab Control

1. **THROTTLE** leveradjust power as needed
2. Land on the nearest suitable airport or in the case of need carry out Precautionary landing - see para 3.9.2

3.14.4 Vibrations

If abnormal vibrations occur on the airplane then:

1. **THROTTLE** leverSet engine RPM to the mode in which the vibrations are the lowest.
2. Land on the nearest possible airport, possibly perform safety landing according to para 3.9.2



3.14.5 Carburetor Icing

Carburetor icing happens when air temperature drop in the carburetor occurs due to its acceleration in the carburetor and further cooling by evaporating fuel. Carburetor icing mostly happens during descending and approaching for landing (low engine RPM).

Carburetor icing shows itself by engine power decreasing, by engine temperature increasing and by irregular engine running.

CAUTION

CARBURETOR ICING MAY OCCUR AT AMBIENT
TEMPERATURE HIGHER THAN 32°F (0°C).

Recommended procedure for engine power regeneration is as follows:

1. **CARBURET. PREHEAT.** knob **OPEN**
2. **THROTTLE** lever set idle and cruising
power again

NOTE

Ice coating in the carburetor should be removed by
decrease and reincrease of engine power.

3. If the engine power is not successfully increased, then carry out landing at the nearest suitable airport or, if it is not possible, carry out safety landing according to para 3.9.2

3.14.6 Clogging of Air Inlet to Engine Intake

Clogging of the air inlet to the engine intake results in engine power reduction, increase of engine temperatures and irregular engine running.

The recommended procedure for engine power recovery is as follows:

1. **CARBURET. PREHEAT.** knob **OPEN**



3.15 Canopy Opening in Flight

WARNING

ALWAYS MAKE SURE BEFORE A TAKEOFF, THAT COCKPIT CANOPY IS FULLY CLOSED – THE RED WARNING LIGHT ON THE DASHBOARD MUST GO OFF.

IF THE AIRPLANE IS EQUIPPED WITH DIGITAL INTEGRATED INSTRUMENTS, THE APPROPRIATE LIGHT ON THE DISPLAY MUST INDICATE CLOSED CANOPY!!!

If the canopy would open in flight due to improper closing, wake behind opened canopy would cause vibrations of the horizontal tail unit and consequently vibrations of the control sticks and airplane controllability would be affected.

Proceed as follows to solve such situation:

1. Grasp shaking control stick(s). This will reduce control sticks and horizontal tail unit vibrations caused by wake behind opened canopy.
2. Pull the throttle lever to reduce airspeed to approximately 65 KIAS (120 km/h IAS).
3. Pull opened canopy down by holding the canopy frame on either side (solo flight) or on both sides (dual flight) and keep holding the canopy pulled down. This will reduce wake acting on the horizontal tail unit and improve airplane controllability.

WARNING

PRIORITY IS TO MAINTAIN AIRPLANE CONTROLLABILITY!

ATTEMPTS TO CLOSE THE CANOPY ARE SECONDARY!

4. Try to close the canopy; this could be possible in dual flight. If not, keep holding the canopy down by either hand.
5. Perform Safety landing according to para 3.9.2
6. It is required after landing to check conditions of the canopy and lock system. Horizontal tail unit must be inspected, as well.
7. Found faults must be fixed before next flight.



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4.1 Introduction

Section 4 describes operations and recommended procedures for normal operation of the airplane. Normal procedures following from system installation and optional equipment, which require supplementation of these Instructions, are shown in section 9 - Supplements.

4.2 Recommended Speeds for Normal Procedures

4.2.1 Take-off

Climbing speed up to 50 ft (flaps in TAKE-OFF pos. - 15°)	57 KIAS (106 km/h IAS)
Best rate-of-climb speed V_y (flaps in TAKE-OFF pos. - 15°)	61 KIAS (113 km/h IAS)
Best rate-of-climb speed V_y (flaps retracted - 0°)	65 KIAS (120 km/h IAS)
Best angle-of-climb speed V_x (flaps in TAKE-OFF pos. - 15°)	48 KIAS (88 km/h IAS)
Best angle-of-climb speed V_x (flaps retracted - 0°)	49 KIAS (90 km/h IAS)

4.2.2 Landing

Approaching speed for normal landing (flaps in LANDING I position - 30°)	57 KIAS (105 km/h IAS)
Approaching speed for normal landing (flaps in LANDING II position - 50°)	54 KIAS (100 km/h IAS)

4.3 Assembly and Disassembly

Description of assembly and disassembly is given in the Airplane Maintenance Manual for SportStar RTC airplane.



4.4 Pre-flight Check

Carry out pre-flight check according to the following procedure:

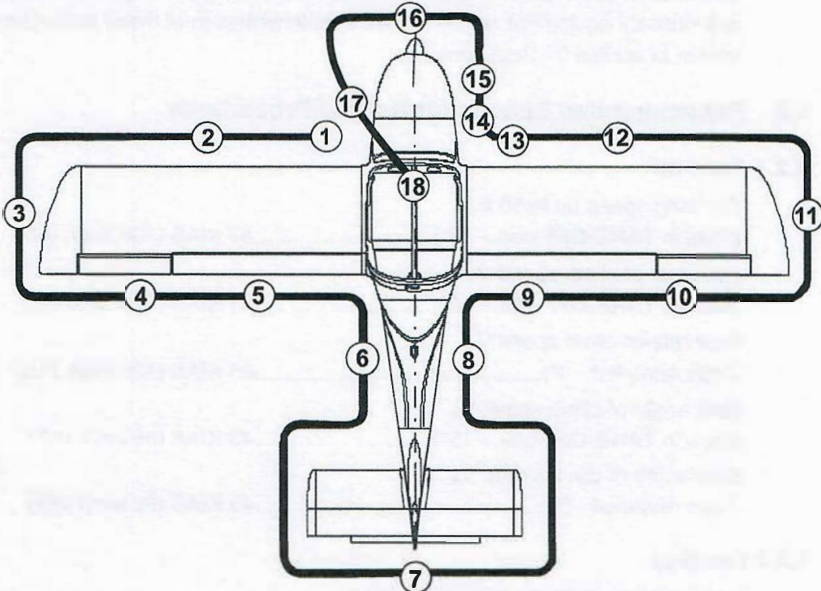


Figure 4-1

WARNING

**CHECK BEFORE PRE-FLIGHT CHECK THAT
IGNITION IS SWITCHED OFF!**

NOTE

The word "condition", used in procedures of pre-flight check, means visual check of surface, damage, deformation, scratches, attrition, corrosion, icing or other effects decreasing flight safety.



1. Left landing gear leg - check
 - landing gear leg attachment and condition
 - attachment of brake system hose
 - landing gear wheel condition
 - condition and attachment of wheel covers
 - no contamination in the draining reservoirs of the pitot-static system
2. Left wing - check
 - wing surface condition
 - closing of the fuel tank cap
 - wing leading edge condition
 - condition of the stalling speed sensor
 - landing light condition
 - condition of the Pitot tube
3. Left wing tip - check
 - surface condition
 - attachment check
 - fuel tank vent - cleanness
 - condition and attachment of the position lights and the anti-collision beacon
4. Left aileron - check
 - surface condition
 - attachment
 - free movement
5. Left wing flap - check
 - surface condition
 - attachment
 - drain fuel tank (see Section 8, para 8.5.2)
6. Rear part of fuselage - check
 - surface condition
 - condition of antennas (top and bottom fuselage surface)
7. Tail units - check
 - tail skid condition
 - surface condition
 - condition of rudder and elevator attachment

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- freedom of rudder and elevator movement
 - condition of trim tab, condition and security of elevator trim tab control rods
8. Rear part of fuselage - check
- surface condition
9. Right wing flap- see 5
10. Right aileron- see 4
11. Right wing tip - see 3
12. Right wing - see 2 - except the landing light and Pitot tube
13. Right landing gear leg - see 1
14. Front part of the fuselage - right hand side - check
- tilting canopy attachment and condition
 - condition and attachment of GPS antenna
 - condition and cleanness of air intakes
 - condition of the nose landing gear leg and nose wheel
 - condition of the nose wheel control rods
15. Engine
- Checks before the first flight of day - it is necessary to remove upper engine cowling:
- condition of engine bed
 - condition of engine attachment
 - condition of exhaust system
 - condition of engine cowlings
 - visual check on fuel and electrical system condition
 - check on cooling liquid volume in the expansion tank on the engine body (replenish as required up to max. 2/3 of the expansion tank volume)
 - check on cooling liquid level in the overflow bottle (volume should be approx. 0.42 pints (0.2 liter))
- Checks before every flight:
- cleanness of air intakes
 - check on oil level (between marks - flattening on the dip stick; difference between min. – max. marks is 0.5 l)
 - proper closing of the upper engine cowling



16. Propeller - check
 - attachment
 - condition of blades, hub and spinner
17. Front part of fuselage - left hand side - check
 - cleanness of air intakes
 - tilting canopy attachment and condition
18. Cockpit - check

NOTE

Canopy is unlocked if a latch next to lock is visible under the glass, otherwise it is locked. Unlock it first with key.

- **MASTER SWITCH** **ON**
- Check canopy OPEN/CLOSE red indication light function.
- All switches **OFF**
- Instrument equipment check on condition
- Check of safety belts condition and attachment
- Check pressure in the portable fire extinguisher (press gauge in the green arc)
- Check on presence of loose object in the cockpit
- Check on adjusting and securing the rudder pedals (see Section 7, para 7.3.3)

WARNING

**RIGHT AND LEFT PEDAL OF RUDDER CONTROL
MUST BE SET TO THE SAME POSITIONS AND
WELL SECURED!**

- POH and other required documents check on completeness and validity



4.5 Normal Procedures and Checklist

4.5.1 Before Engine Starting

1. Pre-flight check and check on weight and centre of gravity position done
2. Safety harnesses..... check, fasten
3. Rudder pedals free
4. Control stick..... free
5. Wing flaps..... function check
6. **MASTER SWITCH** **ON**
7. Trim tab function check
8. **PARKING BRAKE** handle release brakes
9. Brakes function check
10. **AVIONICS SWITCH** **OFF**
11. Ignition..... **OFF**
12. Canopy close

4.5.2 Engine Starting

1. Fuel gauge indicators check of fuel quantity
2. **FUEL** selector **LEFT**
Pull the safety button on the fuel selector, turn the handle to the left and then release safety button. Now the handle can be freely moved between left and right position. Safety button prevents unintentionally switch the selector to **OFF** position.
3. Electric fuel pump **ON**
4. **THROTTLE** lever idle
5. **CHOKE** as necessary
6. Space in the propeller area free
7. **BEACONS** **ON** (if necessary)
8. Brakes apply



- 9. Ignition.....**START** (see CAUTION)
after starting up **BOTH**

CAUTION

ACTIVATE STARTER FOR 10 SEC. AS A MAXIMUM, AND THEN LET IT COOL DOWN FOR 2 MINUTES.

AFTER STARTING UP ENGINE, DO NOT CARRY OUT SUDDEN RPM CHANGES, AFTER POWER DECREASE WAIT FOR ABOUT 3 SEC. IN ORDER TO REACH CONSTANT RPM BEFORE REACCELERATION.

- 10. **THROTTLE** lever as necessary (see NOTE)
- 11. Oil pressure up to 10 sec. min. pressure

NOTE

After starting up engine, adjust throttle for smooth engine running at about 2500 RPM. Check oil pressure. Pressure must increase within 10s. Increase engine RPM until oil pressure is stabilized over 2 bar (29 PSI).

- 12. Engine instruments.....check
- 13. **CHOKE** as necessary
- 14. Engine warming up..... see NOTE

NOTE

Begin warming up with engine running at 2000 RPM. For about 2 minutes, continue at 2500 RPM. Warming time depends on outside air temperature until oil temperature reaches 50°C / 122 °F.

- 15. **FUEL** selector**RIGHT**
Verify proper engine feeding from the right tank for approx. 1 minute.
- 16. **FUEL** selector**LEFT** or **RIGHT**
- 17. **AVIONICS SWITCH**.....**ON**
- 18. Radio station / avionics**ON**
- 19. Other electrical equipment.**ON** as necessary



4.5.3 Before Taxiing

1. Transponder**SBY**
2. Outside lightsas necessary
3. **BEACONS****OFF**
4. **SOCKET****OFF**

4.5.4 Taxiing

1. **THROTTLE** leveras necessary
2. Brakescheck by depressing
3. Rudder pedalsfunction check
4. Direction of taxiing control by rudder pedals (these are mechanically connected with nose wheel control), possibly by slacking up left and right wheel of the main landing gear.

4.5.5 Before Take-off

1. Brakesapply
2. **BEACONS****ON** (if necessary)
3. Ignition checkcarry out, see NOTE

NOTE

Carry out ignition check in the following way:
 Set engine speed to 4000 RPM. Switch ignition gradually to **L, BOTH, R** position and return to **BOTH**. RPM drop with one ignition circuit switched off must not exceed 300 RPM. Maximum RPM difference at using one of the L or R circuits is 120 RPM.

4. Control stick.....free
5. Wing flaps**TAKE-OFF** position (15°)
6. Trim tab**NEUTRAL**
7. Fuel gauge indicatorcheck on fuel quantity
8. **FUEL** selector**LEFT** or **RIGHT**
9. Electric fuel pump.....**ON**
10. **CARBURET. PREHEAT.**check function then **OFF**

NOTE

If **CARBURET. PREHEAT.** is switched ON, then engine RPM drop reaches approximately 50 RPM.



11. Engine instrument check
12. Flight instrument check
13. Radio station / avionics check, set
14. Ignition check **BOTH**
15. **CHOKE** **CLOSED** (in inserted position)
16. Safety harness tighten up
17. Canopy closed
18. Transponder **ON** or **ALT**

4.5.6 Take-off

1. **THROTTLE** lever max. take-off power
2. During take-off run smoothly lighten up the nose landing gear until airplane take-off occurs.
3. After take-off accelerate airplane to 57 KIAS (106 km/h IAS)
4. Main landing gear wheels brake
5. After reaching 150 ft, set flaps to retracted position 0°
6. Accelerate airplane to 65 KIAS (120 km/h IAS)
7. Trim as necessary

WARNING

TAKE-OFF IS PROHIBITED:

- **IF ENGINE RUNNING IS IRREGULAR**
- **IF CHOKE IS OPEN**
- **IF VALUES OF ENGINE INSTRUMENTS ARE NOT WITHIN THE REQUIRED RANGE**



4.5.7 Climb

1. **THROTTLE** levermax. continuous power
2. Airspeed $V_Y = 65$ KIAS (120 km/h IAS)
..... $V_X = 49$ KIAS (90 km/h IAS)
3. Engine instrumentcheck
4. Trimas necessary
5. Electric fuel pump**OFF**

4.5.8 Cruise

1. **THROTTLE** leveras necessary
2. Airspeedas necessary
3. Engine instruments.....check
4. Fuel quantitycheck

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

NOTE

It is recommended to alternately switch the tanks during cruise to equally consume fuel from both tanks and minimize airplane tendency to bank with unbalanced tanks.

If the engine conks out due to fuel consumption from either tank, then immediately switch the fuel selector to other tank and engine run will be recovered within 7 seconds.

5. **CARBURET. PREHEAT**as necessary



4.5.9 Descent

1. **THROTTLE** leveras necessary
2. Airspeedas necessary
3. Trimas necessary
4. Engine instrumentcheck
5. **CARBURET. PREHEAT.**as necessary

CAUTION

AT LONG APPROACHING AND DESCENDING FROM HIGH ALTITUDE IT IS NOT SUITABLE TO REDUCE THROTTLE TO MINIMUM FOR THE REASON OF POSSIBLE ENGINE UNDERCOOLING AND SUBSEQUENT LOSS OF POWER. PERFORM DESCENDING AT INCREASED IDLE AND CHECK OBSERVANCE OF THE ALLOWED VALUES ON ENGINE INSTRUMENTS.

4.5.10 Before Landing

1. Fuel quantitycheck

CAUTION

FUEL GAUGES DISPLAY TRUE FUEL QUANTITY ONLY ON GROUND AND IN A LEVEL FLIGHT. TO READ TRUE FUEL QUANTITY AFTER TRANSITION FROM CLIMB/DESCENT WAIT APPROX. 2 MINUTES TO FUEL TO LEVEL.

2. **FUEL** selector**LEFT or RIGHT**
3. Enginecheck
4. Brakescheck by depressing pedals
5. Safety harnesses.....tighten up
6. Free area of landingcheck
7. **CARBURET. PREHEAT.****ON**
8. Approaching speed59 KIAS (110 km/h IAS)
9. Flaps.....**TAKE-OFF** position (15°)
10. Airspeed57 KIAS (106 km/h IAS)
11. Trimas necessary



12. **PARKING BRAKE** check for lever down

13. Electric fuel pump **ON**

14. **SOCKET** **OFF**

FINAL – NORMAL LANDING

1. Flaps **LANDING I** position (30°)

2. Maintain airspeed 57 KIAS (105 km/h IAS)

3. Trim as necessary

4. **CARBURET. PREHEAT.** **OFF**

FINAL – SHORT LANDING

5. Flaps **LANDING II** position (50°)

NOTE

When extending wing flaps to **LANDING II** (50°) position at flight speeds close to V_{FE} , it is necessary to exert an increased force on the wing flap control lever.

6. Maintain airspeed 54 KIAS (100 km/h IAS)

7. Trim as necessary

8. **CARBURET. PREHEAT.** **OFF**

4.5.11 Bailed Landing

1. **THROTTLE** lever max. take-off power

2. Airspeed min. 54 KIAS (100 km/h IAS)

3. Flaps **TAKE-OFF** position (15°)

4. Airspeed 57 KIAS (106 km/h IAS)

5. Flaps at altitude of 150 ft **RETRACTED** position (0°)

6. Climb at speed 65 KIAS (120 km/h IAS)

7. Trim as necessary

8. **THROTTLE** lever max. continuous power

9. Instruments check

4.5.12 Landing

1. Flaps **LANDING I** position (30°)

2. **THROTTLE** lever idle

3. Touch-down on main landing gear wheels carry out

4. Brakes after nose landing gear wheel touch-down as necessary



4.5.12.1 Short Landing

1. Flaps.....**LANDING II** position (50°)
2. **THROTTLE** lever idle
3. Airspeed 49 KIAS (90 km/h IAS)
4. Touch-down on all three wheels..... carry out
5. Brakes after touch-down brake

4.5.13 After Landing

1. Flaps.....**RETRACTED** position (0°)
2. Trim**NEUTRAL**
3. Outside light**OFF**
4. Transponder**OFF**
5. Electric fuel pump.....**OFF**
6. **BEACONS****OFF**

4.5.14 Engine Shut-off

1. **THROTTLE** lever idle
2. Engine instruments..... check
3. Radio station / avionics**OFF**
4. **AVIONICS SWITCH****OFF**
5. Other electrical equipment**OFF**
6. Ignition.....**OFF**
7. **MASTER SWITCH****OFF**

**4.5.15 Airplane Parking**

1. Ignition check **OFF**
2. **MASTER SWITCH** check **OFF**
3. **FUEL selector** **OFF**

Pull the safety button on the fuel selector, turn the handle to the **OFF** position and then release safety button. Now the handle is blocked in the **OFF** position. Safety button prevents unintentionally switch the selector from the **OFF** position.

4. **PARKING BRAKE** handle brake as necessary
5. Fix the control stick using safety harnesses during long-time parking.
6. Canopy close,
lock as necessary

NOTE

It is recommended to use parking brake for short-time parking only, between flights during a flight day. After ending the flight day or at low temperatures of ambient air, do not use parking brake, but use the wheel chocks instead.



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5.1 Introduction

Section 5 provides data for airspeed calibration, stall speeds, take-off performance and additional information, provided by the airplane type certificate owner.

CAUTION

THE PERFORMANCE STATED IN THIS SECTION IS VALID FOR ROTAX 912 ULS (100 HP) TOGETHER WITH WOODCOMP KLASSIC 170/3/R PROPELLER INSTALLED IN THE AIRPLANE.



5.2 Approved Performance Data

5.2.1 Airspeed Indicator System Calibration

NOTE

Assumed zero instrument error. Valid for airplane take-off weight 600 kg.

	RETRACTED 0°	TAKE-OFF 15°	LANDING I 30°	LANDING II 50°
	KIAS	KCAS	KCAS	KCAS
V_{SO}	39			43
V_{S1} flaps 30°	40		45	44
V_{S1} flaps 15°	41		45	44
V_{S1} flaps 0°	42	48	47	45
	43	48	47	46
	46	51	50	49
	49	53	52	51
	51	55	54	53
	54	58	57	56
	57	60	59	58
	59	62	61	60
	62	65	64	63
	65	67	66	65
	67	69	68	67
V_{FE}	70	72	71	70
	76	77		
	81	81		
	86	86		
V_A	90	89		
	92	91		
	97	96		
	103	101		
	108	105		
	113	110		
V_C	115	112		
	119	115		
	124	120		
	130	125		
	135	130		
	140	135		
V_{NE}	146	140		



	RETRACTED 0°	TAKE-OFF 15°	LANDING I 30°	LANDING II 50°
	IAS (km/h)	CAS (km/h)	CAS (km/h)	CAS (km/h)
V_{SO}	73			79
V_{S1} flaps 30°	75		83	81
V_{S1} flaps 15°	76	85	83	82
V_{S1} flaps 0°	78	88	85	84
	80	90	88	87
	85	94	92	91
	90	98	96	95
	95	102	101	100
	100	107	105	104
	105	111	109	108
	110	115	114	113
	115	120	118	117
	120	124	122	121
	125	128	127	126
V_{FE}	130	133	131	130
	140	142		
	150	151		
	160	159		
V_A	167	165		
	170	168		
	180	177		
	190	186		
	200	195		
	210	204		
V_C	214	208		
	220	214		
	230	223		
	240	232		
	250	241		
	260	251		
V_{NE}	270	260		



5.2.2 Stall Speed

- Conditions:**
- wing level stall - engine at idle power
 - turning flight stall - engine at 75% max. continuous power
 - airplane weight - 600 kg
 - airplane centre of gravity 30% MAC

NOTE

The stated stall speeds are valid for all flight altitudes. Altitude losses shown in the table present max. values determined on the basis of flight tests using average piloting technique.

	Flaps position	Stall speed		Altitude loss ft
		KIAS	KCAS	
Wing level flight	Retracted (0°)	42	48	200 ft
	Take-off(15°)	41	46	
	Landing I (30°)	40	44	
	Landing II (50°)	39	43	
Turn flight (coordinated turn 30° bank)	Retracted (0°)	46	51	200 ft
	Take-off(15°)	45	49	
	Landing I (30°)	44	48	
	Landing II (50°)	42	46	

	Flaps position	Stall speed		Altitude loss ft
		IAS (km/h)	CAS (km/h)	
Wing level flight	Retracted (0°)	78	88	200 ft
	Take-off(15°)	76	85	
	Landing I (30°)	75	82	
	Landing II (50°)	73	79	
Turn flight (coordinated turn 30° bank)	Retracted (0°)	86	95	200 ft
	Take-off(15°)	84	91	
	Landing I (30°)	82	89	
	Landing II (50°)	78	85	

**5.2.3 Take-off Distance**

- Conditions:**
- engine
 - flaps
 - carburetor preheater
 - airplane weight
 - take-off speed
 - airspeed in height of 50 ft
 - airplane centre of gravity
 - max. take-off power
 - Take-off position (15°)
 - OFF
 - 600 kg
 - 43 KIAS (79 km/h IAS)
 - 57 KIAS (106 km/h IAS)
 - 30% MAC

ISA conditions		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Take-off run	Distance over 50 ft obstacle	Take-off run	Distance over 50 ft obstacle
	°C				
0 ft	15,0	128	365	200	450
2000 ft	11,0	144	411	225	506
4000 ft	7,1	162	463	254	571
6000 ft	3,1	183	522	286	644
8000 ft	-0,8	207	591	324	729
10000 ft	-4,8	235	669	367	825

ISA conditions + 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Take-off run	Distance over 50 ft obstacle	Take-off run	Distance over 50 ft obstacle
	°C				
0 ft	25,0	137	391	214	482
2000 ft	21,0	154	440	241	543
4000 ft	17,1	174	496	272	612
6000 ft	13,1	197	561	307	692
8000 ft	9,2	223	635	348	783
10000 ft	5,2	253	720	395	888



ISA conditions + 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Take-off run	Distance over 50 ft obstacle	Take-off run	Distance over 50 ft obstacle
	°C				
0 ft	35,0	146	417	229	515
2000 ft	31,0	165	471	258	580
4000 ft	27,1	186	531	291	655
6000 ft	23,1	211	601	329	741
8000 ft	19,2	239	681	373	840
10000 ft	15,2	271	773	424	953

ISA conditions – 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Take-off run	Distance over 50 ft obstacle	Take-off run	Distance over 50 ft obstacle
	°C				
0 ft	5,0	119	340	186	419
2000 ft	1,0	134	382	209	471
4000 ft	-2,9	151	430	236	531
6000 ft	-6,9	170	485	266	598
8000 ft	-10,8	192	548	300	676
10000 ft	-14,8	218	620	340	765

ISA conditions – 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Take-off run	Distance over 50 ft obstacle	Take-off run	Distance over 50 ft obstacle
	°C				
0 ft	-5,0	111	316	173	390
2000 ft	-11,0	124	355	194	438
4000 ft	-12,9	140	399	219	492
6000 ft	-16,9	158	450	246	554
8000 ft	-20,8	178	507	278	625
10000 ft	-24,8	201	573	314	707

- Corrections:**
- Influence of wind: Add 4% on every 1 kt (0.5 m/s) of tail wind
 - RWY inclination: Add 8% of the take-off run distance on 1% of runway inclination up the slope



5.2.4 Landing Distance

- Conditions:**
- engine – idle
 - flaps – LANDING I position (30°)
 - carburetor preheating - OFF
 - airplane weight – 600 kg
 - touch down speed – 44 KIAS (82 km/h IAS)
 - airplane speed at height of 50 ft – 57 KIAS (105 km/h IAS)
 - airplane centre of gravity - 30% MAC

ISA conditions		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	15,0	169	428	218	477
2000 ft	11,0	179	454	231	506
4000 ft	7,1	190	482	245	537
6000 ft	3,1	202	512	261	571
8000 ft	-0,8	215	545	277	607
10000 ft	-4,8	229	580	295	646

ISA conditions + 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	25,0	175	443	226	494
2000 ft	21,0	186	470	239	524
4000 ft	17,1	197	499	254	556
6000 ft	13,1	210	531	270	591
8000 ft	9,2	223	565	288	629
10000 ft	5,2	237	601	306	670



ISA conditions + 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	35,0	181	458	233	510
2000 ft	31,0	192	486	248	542
4000 ft	27,1	204	516	263	575
6000 ft	23,1	217	549	280	612
8000 ft	19,2	231	585	298	652
10000 ft	15,2	246	623	317	694

ISA conditions – 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	5,0	163	413	210	460
2000 ft	1,0	173	438	223	488
4000 ft	-2,9	184	465	237	518
6000 ft	-6,9	195	494	251	550
8000 ft	-10,8	207	525	267	585
10000 ft	-14,8	220	558	284	622

ISA conditions – 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	-5,0	157	398	203	444
2000 ft	-11,0	167	422	215	470
4000 ft	-12,9	177	448	228	499
6000 ft	-16,9	188	475	242	529
8000 ft	-20,8	199	505	257	562
10000 ft	-24,8	212	536	273	598

- Corrections:**
- Add 4.5 % on every 1 kt (0.5 m/s) of tail wind
 - RWY inclination: Add 8% of the landing run distance on 1% of runway inclination down the slope



- Conditions:**
- engine – idle
 - flaps – LANDING II position (50°)
 - carburetor preheating - OFF
 - airplane weight – 600 kg
 - touch down speed – 42 KIAS (78 km/h IAS)
 - airplane speed at height of 50 ft – 53 KIAS (99 km/h IAS)
 - airplane centre of gravity - 30% MAC

ISA conditions		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C	m	m	m	m
0 ft	15,0	143	361	185	407
2000 ft	11,0	152	383	196	432
4000 ft	7,1	161	407	208	458
6000 ft	3,1	171	432	221	487
8000 ft	-0,8	182	459	235	518
10000 ft	-4,8	194	489	251	551

ISA conditions + 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C	m	m	m	m
0 ft	25,0	148	374	191	421
2000 ft	21,0	157	396	203	447
4000 ft	17,1	167	421	216	475
6000 ft	13,1	177	448	229	505
8000 ft	9,2	189	476	244	537
10000 ft	5,2	201	507	260	572



ISA conditions + 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	35,0	153	386	198	435
2000 ft	31,0	162	410	210	462
4000 ft	27,1	173	436	223	491
6000 ft	23,1	183	463	237	522
8000 ft	19,2	195	493	253	556
10000 ft	15,2	208	525	269	592

ISA conditions – 10°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	5,0	138	348	179	393
2000 ft	1,0	146	369	189	417
4000 ft	-2,9	155	392	201	442
6000 ft	-6,9	165	416	213	469
8000 ft	-10,8	175	442	227	499
10000 ft	-14,8	186	471	241	531

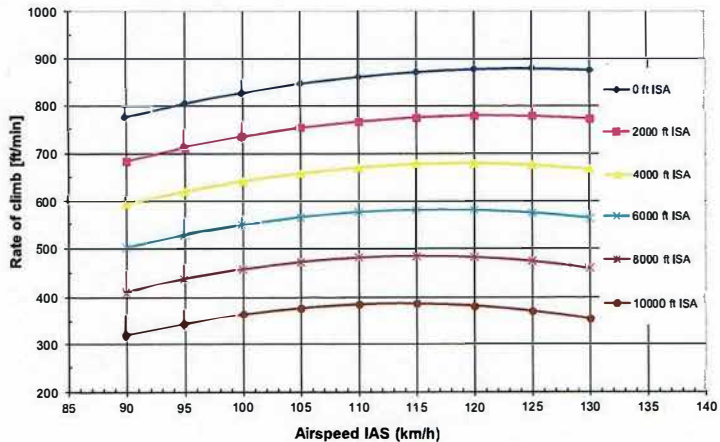
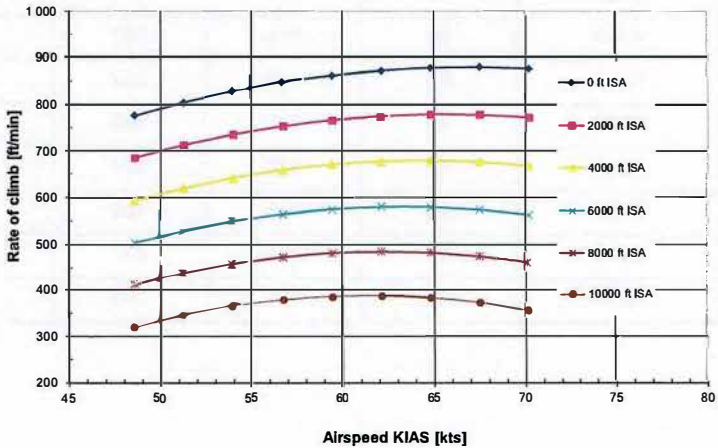
ISA conditions – 20°C		Concrete RWY		Grass RWY	
Airport altitude	Temperature	Landing run	Distance over 50 ft obstacle.	Landing run	Distance over 50 ft obstacle.
	°C				
0 ft	-5,0	133	336	172	379
2000 ft	-11,0	141	356	182	401
4000 ft	-12,9	150	377	193	426
6000 ft	-16,9	159	401	205	452
8000 ft	-20,8	169	426	218	480
10000 ft	-24,8	179	452	232	510

- Corrections:**
- Add 4.5 % on every 1 kt (0.5 m/s) of tail wind
 - RWY inclination: Add 8% of the landing run distance on 1% of runway inclination down the slope



5.2.5 Climb Performance

- Conditions:**
- engine - maximum take-off power
 - flaps - retracted (0°)
 - carburetor preheating - OFF
 - airplane weight - 600 kg
 - ambient air temperature - ISA
 - airplane centre of gravity - 30% MAC





Section 5

Performance

PILOT'S OPERATING HANDBOOK

Doc. No. ERTC020-10-AS

Best rate of climb for various altitudes is mentioned in the following table:

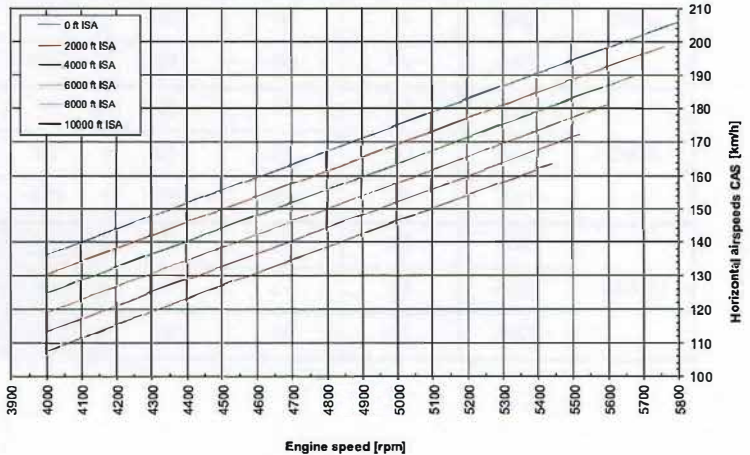
Altitude	Best rate of climb speed		Max. rate of climb	
	KIAS	km/h IAS	fpm	m/s
0	67	123	876	4.5
1000	66	122	827	4.2
2000	65	121	779	4.0
3000	65	120	730	3.7
4000	64	119	681	3.5
5000	64	118	632	3.2
6000	63	117	583	3.0
7000	63	116	534	2.7
8000	62	115	486	2.5
9000	62	114	437	2.2
10000	61	113	388	2.0



5.3 Additional information

5.3.1 Cruise

- Conditions:**
- flaps - retracted (0°)
 - carburetor preheating - OFF
 - airplane weight - 600 kg
 - ambient air temperature - ISA
 - airplane centre of gravity - 30% MAC





5.3.2 Horizontal Speeds

In the following table states Indicated airspeeds (IAS), corresponding calibrated air speeds (CAS) and true air speeds (TAS) versus altitude, all for various engine speeds.

		55% MCP	65% MCP	75% MCP	MCP	MTP
		RPM				
ft ISA	kt	4300	4800	5000	5500	5800
0	IAS	80	91	96	107	114
	CAS	80	90	95	105	111
	TAS	80	91	95	105	111
2000	IAS	76	87	92	104	
	CAS	77	87	91	102	
	TAS	79	90	94	105	
4000	IAS	73	84	89	101	
	CAS	74	84	88	99	
	TAS	78	89	94	105	
6000	IAS	69	81	85	97	
	CAS	71	81	85	96	
	TAS	77	89	93	105	
8000	IAS	65	77	82	94	
	CAS	67	78	82	93	
	TAS	76	88	93	104	
10 000	IAS	61	74	78		
	CAS	64	75	79		
	TAS	75	87	92		



		55% MCP	65% MCP	75% MCP	MCP	MTP
		RPM				
ft ISA	km/h	4300	4800	5000	5500	5800
0	IAS	147	169	177	198	212
	CAS	148	167	175	194	206
	TAS	148	168	175	195	206
2000	IAS	140	163	171	193	
	CAS	142	162	169	189	
	TAS	146	166	174	194	
4000	IAS	134	156	165	186	
	CAS	136	156	164	183	
	TAS	145	165	173	194	
6000	IAS	128	149	158	180	
	CAS	131	150	158	177	
	TAS	143	164	173	194	
8000	IAS	121	143	152	174	
	CAS	125	144	152	172	
	TAS	141	163	172	193	
10 000	IAS	114	137	145		
	CAS	119	139	146		
	TAS	139	162	171		



5.3.3 Endurance

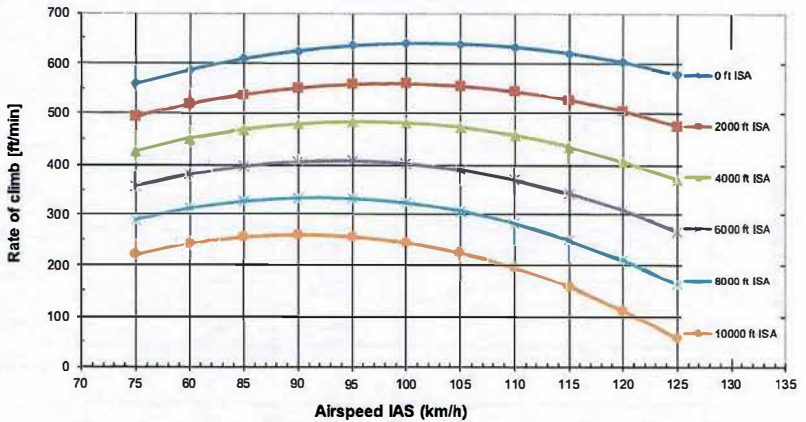
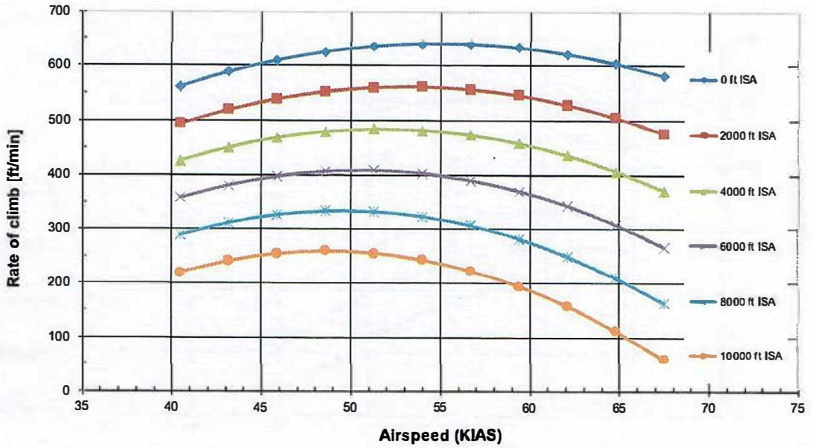
- Conditions:**
- flaps - retracted (0°)
 - carburetor preheating - OFF
 - airplane weight - 1323 lb / 600 kg
 - ambient air temperature - ISA
 - airplane centre of gravity - 30% MAC

Endurance and range altitude 2000 ft ISA		55% MCP	65% MCP	75% MCP	MCP
Engine speed	RPM	4300	4800	5000	5500
Fuel consumption	l/h	12,4	15,8	17,4	22,4
IAS	kt	76	87	92	104
	km/h	140	163	171	193
CAS	kt	77	87	91	102
	km/h	142	162	169	189
TAS	kt	79	90	94	105
	km/h	146	166	174	194
Endurance at 118 l of fuel	h:m	9:30	7:30	6:48	5:18
	km	1393	1245	1180	1025
Endurance at 100 l of fuel	h:m	8:06	6:18	5:42	4:30
	km	1180	1055	1000	869
Endurance at 80 l of fuel	h:m	6:24	5:06	4:36	3:36
	km	944	844	800	695
Endurance at 60 l of fuel	h:m	4:48	3:48	3:24	2:42
	km	708	633	600	521
Endurance at 40 l of fuel	h:m	3:12	2:30	2:18	1:48
	km	472	422	400	348



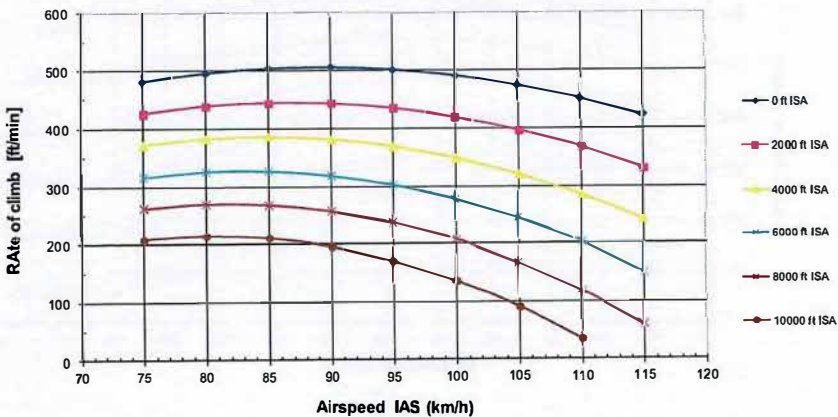
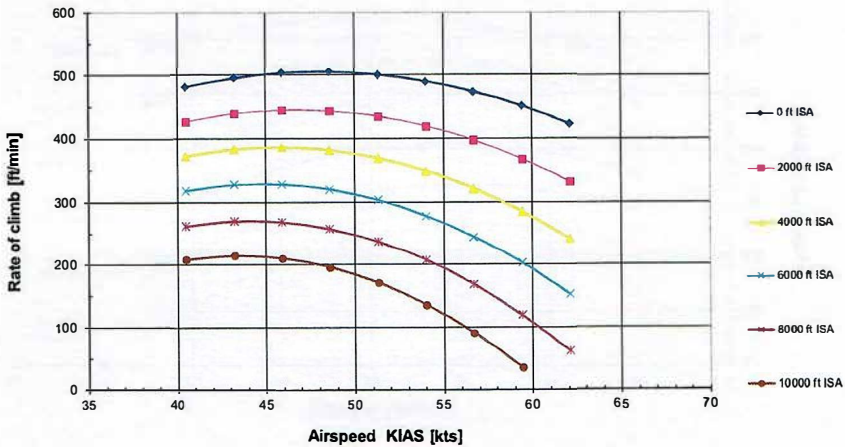
5.3.4 Balked Landing Climb

- Conditions:**
- engine - maximum take-off power
 - flaps - LANDING I position (30°)
 - carburetor preheating - OFF
 - airplane weight - 600 kg
 - ambient air temperature - ISA
 - airplane centre of gravity - 30% MAC





- Conditions:**
- engine
 - maximum take-off power
 - flaps
 - LANDING II position (50°)
 - carburetor preheating
 - OFF
 - airplane weight
 - 600 kg
 - ambient air temperature
 - ISA
 - airplane centre of gravity
 - 30% MAC





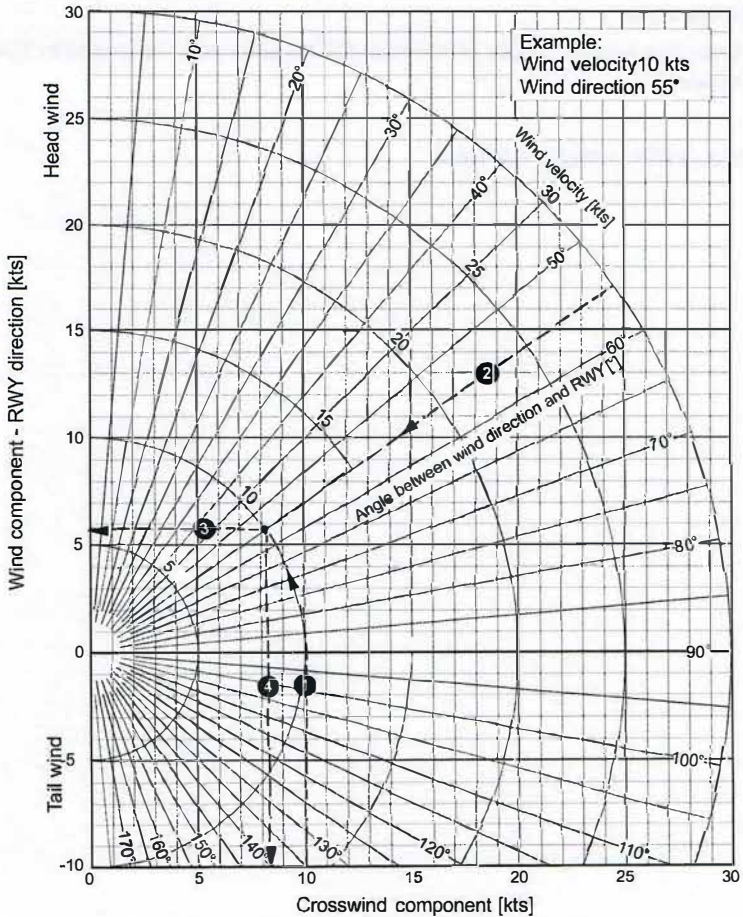
5.3.5 Effect on Flight Performance and Characteristics

Flight performances and characteristics are not considerably affected by rain or insect stuck on the airplane surface.

5.3.6 Demonstrated Crosswind Performance

Maximum demonstrated speed of cross wind
for take-off and landing..... 18 kt (9 m/s)

Maximum demonstrated speed of tail wind 6 kt (3 m/s)





5.3.7 Ceiling

- Conditions:**
- engine - ROTAX 912 ULS
 - propeller - Woodcomp Klassic 170/3/R
 - flaps - retracted (0°)
 - airplane weight - 600 kg
 - airplane centre of gravity - 30% MAC

Service ceiling 15 820 ft

5.3.8 Noise data

Measured average values of SportStar RTC outside noise according to ICAO – Annex 16:

(L_{Amax}) REF = 66.5 ± 1.3 dB(A)



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6.1 Introduction

This Section includes Weight and Balance Record of empty airplane, Permitted Payload Range within which the airplane may be safely operated, and a method to determine whether the operational weight and CG location will be within the permitted limits range.

Procedure for weighing the airplane and the calculation method for establishing the permitted payload range are contained in the Airplane Maintenance Manual for SportStar RTC.



6.3 Permitted Payload Range

Maximum weight of crew [kg]												
Date	Empty weight [kg]	C.G. [% MAC]	FUELLING					Approved				
			Fuel volume	1	0.8	0.6	0.4	0.2	Date	Signature		
			Fuel volume	120 l	100 l	75 l	50 l	25 l				
			Fuel weight	86 kg	72 kg	54 kg	36 kg	18 kg				
24. 11. 2016	347,3	21,44	B A G G A G E	25 kg	141	156	174	192	210	24. 11. 2016	[Signature]	
				12 kg	154	169	187	205	223			
				0 kg	166	181	199	217	235			
				25 kg								
				12 kg b								
				0 kg								
				25 kg								
				12 kg								
				0 kg								
				25 kg								
				12 kg								
				0 kg								



6.4 Operational Weight and Balance Computation

CAUTION

THE AIRPLANE PILOT IS RESPONSIBLE FOR AN APPROPRIATE LOADING OF THE AIRPLANE. AT LOADING THE AIRPLANE, THE WEIGHT LIMITATIONS SHOWN IN PARAGRAPH 2.7 MUST NOT BE EXCEEDED AND C.G. POSITION OF THE AIRPLANE MUST LIE WITHIN THE ENVELOPE - SEE PARA 2.8.

6.4.1 Computation Procedure

1. Record into the Airplane Loading Schedule Chart (para 6.5) current empty weight and static moment of the airplane, which you read from the table Weight and Balance Record (para 6.2).
2. Record the weight of crew, fuel, and baggage into the Airplane Loading Schedule Chart (para 6.5).
3. See the Table of Static Moments (para 6.6) or Airplane Loading Graph (para 6.7) to read static moments for given weights of crew, fuel, and baggage.
4. Record found moments into the Airplane Loading Schedule Chart (para 6.5).
5. Determine Take-off weight of the airplane – add together the airplane empty weight, crew, fuel, and baggage and record the result into the Loading Schedule Chart (para 6.5).
6. Check, whether the calculated Take-off weight does not exceed Airplane Maximum Take-off Weight 600 kg. If yes, then it is necessary to reduce weight of some of the useful load items (fuel, baggage).

WARNING

DO NOT EXCEED MAXIMUM WEIGHTS AND LIMITATION OF CENTER OF GRAVITY! THEIR EXCEEDING LEADS TO AIRPLANE OVERLOADING AND TO DEGRADATION OF FLIGHT CHARACTERISTICS AND DETERIORATION OF MANOEUVRABILITY.

7. Determine Total Static Moment of loaded airplane – add together the static moment of empty airplane, crew, fuel, and baggage and record the result into the Loading Schedule Chart (para 6.5).



8. Plot Takeoff Weight and Total Static Moment into the SportStar RTC airplane CG Moment Envelope (para 6.8).
9. Check, whether the intersection of Take-off weight horizontal line and Total Static Moment vertical line is inside the envelope.
 If **YES**, then the flight may be safely performed as regards weight and balance.
 If **NOT**, then it is necessary to change weight of some of the useful load items (crew, fuel, baggage) and perform the computation again.

WARNING

SAFETY OF FLIGHT PERFORMED WITH THE AIRPLANE LOADED OUTSIDE PERMITTED LIMITS OF WEIGHT AND STATIC MOMENTS MAY BE DETERIORATED!

6.5 Airplane Loading Schedule Chart

Type / model:		SportStar RTC	Serial No:			Registration:		
Loading Schedule Chart			Sample Airplane		Your Airplane			
No.	Item	Arm (m)	Weight (kg)	Moment (kg.m)	Weight (kg)	Moment (kg.m)		
1.	Empty airplane	-	325	81,3				
2.	Crew	0.545	150	81,8				
3.	Baggage (Max. 25 kg)	1.083	10	10,8				
4.	Fuel (Max. 120 L)	0.680	36	24,5				
5.	Take-off weight = Sum of weights 1 - 4 (MTOW 600 kg)		521	198,3				
	Total moment = Sum of moments 1 - 4							

**6.6 Table of Static Moments**

Crew	
Weight (kg)	Moment (kg.m)
0	0
50	27.3
60	32.7
70	38.2
80	43.6
90	49.1
100	54.5
110	60.0
120	65.4
130	70.9
140	76.3
150	81.8
160	87.2
170	92.7
180	98.1
190	103.6
200	109.0
210	114.5
220	119.9

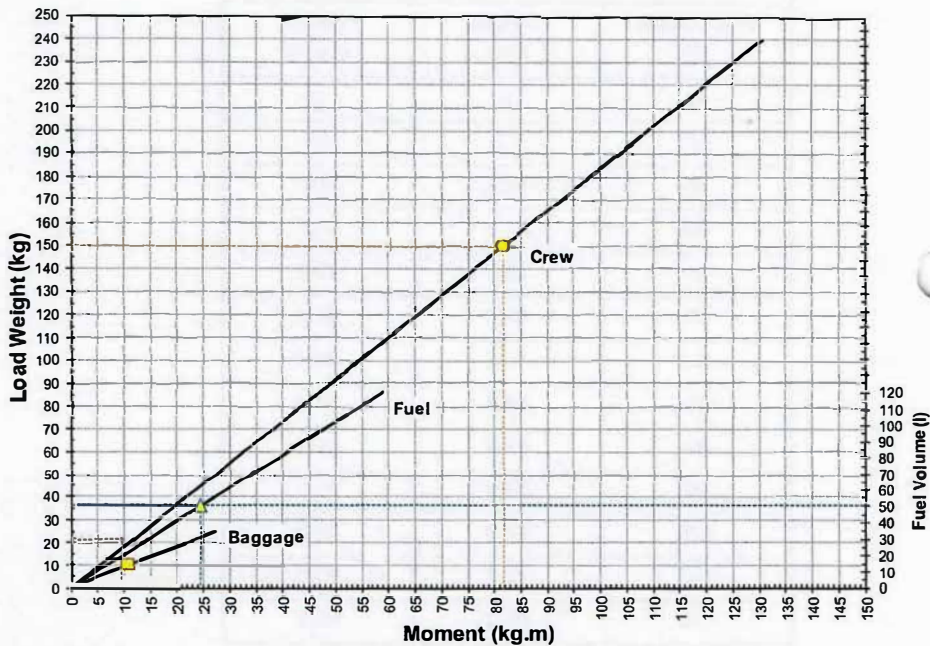
Baggage	
Weight (kg)	Moment (kg.m)
0	0
5	5.4
10	10.8
15	16.2
20	21.7
25	27.1



Fuel		
Fuel volume (l)	Weight (kg)	Moment (kg.m)
0	0	0
10	7.2	4.9
20	14.4	9.8
30	21.6	14.7
40	28.8	19.6
50	36.0	24.5
60	43.2	29.4
70	50.4	34.3
80	57.6	39.2
90	64.8	44.1
100	72.0	49.0
110	79.2	53.9
120	86.4	58.8

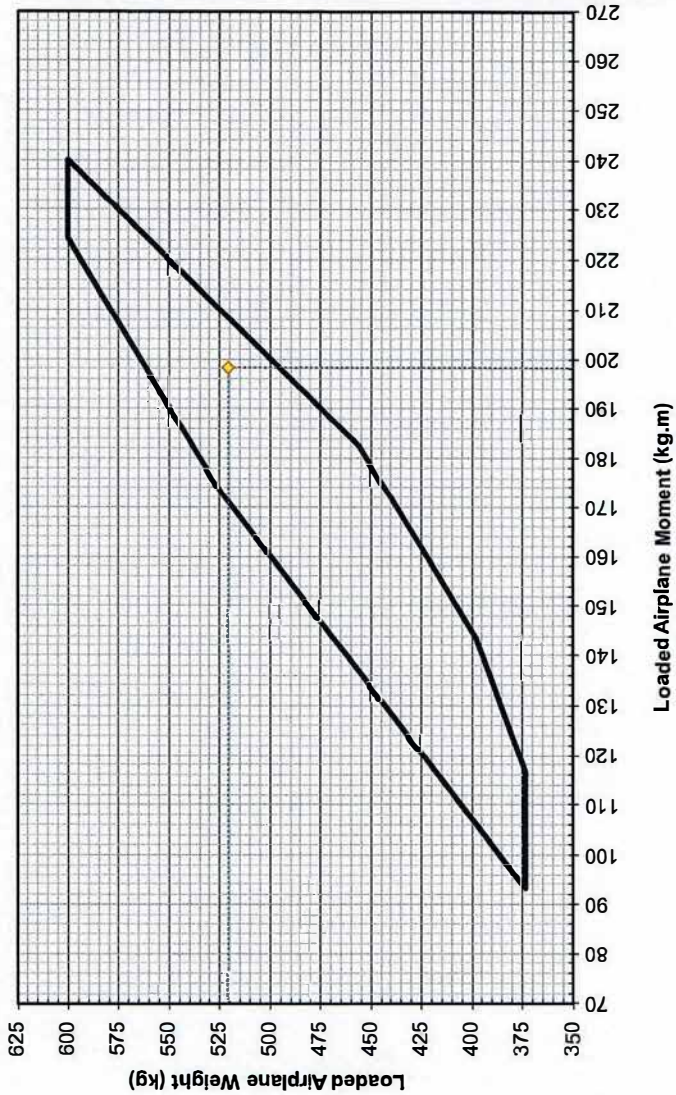


6.7 Airplane Loading Graph





6.8 CG Moment Envelope of SportStar RTC Airplane





6.9 Equipment List

The equipment list is located in Supplement in Section 9 of this POH.



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7.1 Introduction

This section describes systems of the airplane and its operation. Information on optional systems and equipment is available in section 9, Supplements.

7.2 Airframe

The airframe of SportStar RTC airplane is of semimonocoque, metal -composite structure consisting of metal reinforcement, frames and duralumin sheet skin.

7.2.1 Fuselage

The fuselage is of semimonocoque structure consisting of reinforcements and duralumin skin. Fuselage section is rectangular in the lower part and elliptic in the upper part. The fin is an integral part of fuselage. Top part of the fuselage including canopy frame is made of composite. The cockpit for two-member crew is located in the middle part of the fuselage that is accessible after uncovering the single-piece organic glass canopy. The engine compartment in the front part of the fuselage is separated from the cockpit by the steel fire wall to which the engine bed is attached.

7.2.2 Wing

The wing is of rectangular shape, single-spar structure with the auxiliary spar with suspended ailerons and split wing flaps. Riveting is used for connecting individual structural elements. Fiber-glass wing tips are riveted on the wing ends.

7.2.3 Horizontal Tail Unit (HTU)

The HTU of conventional type consists of the stabilizer and elevator with the trim tab. Single-spar structure of HTU consists of duralumin ribs, spar and skin. Top view of HTU is of rectangular shape.

7.2.4 Vertical Tail Unit

VTU is of trapezoidal shape. Its fin is an integral part of the fuselage. The rudder is suspended on the fin by means of two hinges. The VTU structure consists of the duralumin spar and skin.



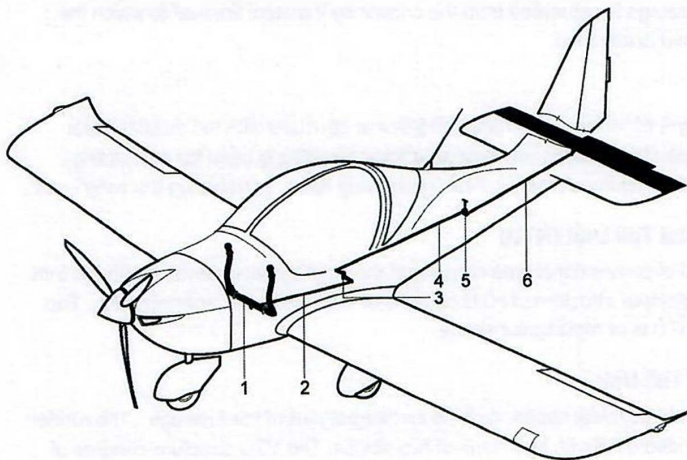
7.3 Control

Airplane control consists of ailerons, elevator and rudder. Directional control is connected by means of pull rods with nose landing gear control. Main landing gear brakes are controlled by pedals of directional control.

Airplane is equipped with dual control enabling flight with two-member crew.

7.3.1 Longitudinal Control

The longitudinal control is operated by the left control stick or the right control stick that are attached to the countershaft of manual control (1, Figure 7-1). The movement of the control stick is transferred from the countershaft by the pull-rod (2), led via the central channel (between the seats) in the cockpit, to the deflection of the two-armed lever (3) located under the floor in the baggage compartment. An angular deflection of the two-armed lever is transferred to a longitudinal movement of two pull-rods (4; 6) connected with the rocker arm (5) in the middle of the rear part of the fuselage. The rear pull-rod (6) is attached to the elevator lever.



Legend to Figure 7-1:

- | | | | |
|---|--------------------------------|---|------------|
| 1 | Countershaft of manual control | 4 | Pull-rod |
| 2 | Pull-rod | 5 | Rocker arm |
| 3 | Two-armed lever | 6 | Pull-rod |

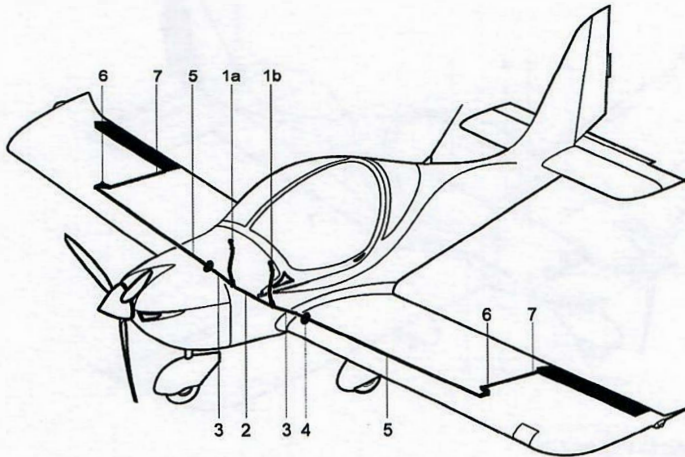
Figure 7-1 Longitudinal control



7.3.2 Lateral Control

The lateral control is controlled by the left control stick (1b, Figure 7-2) or by the right control stick (1a) attached to the countershaft of manual control. The size of lever swing to the left or to the right from the vertical position determines the size of the aileron deflection. The movement of the control stick is transferred by the system of pull-rods and by the angular lever to the pull-rod of aileron.

The control elements are located on the main spar brackets. The control sticks (1a; 1b) are mutually connected by the pull-rod (2). The pull-rods (3) connected with the pull-rods (5) are attached to the control sticks. The pull-rods (5) pass through the grommets in ribs No. 1 and are connected with the angular levers (6). The angular levers (6) transfer the movement to the pull-rods (7) connected with the levers on the ailerons. The bellcranks (6) are pivoted in the brackets in the wing.



Legend to Figure 7-2:

1a	Control stick – right	4	Grommet
1b	Control stick – left	5	Pull-rod
2	Connecting pull-rod	6	Bellcrank
3	Pull-rod	7	Pull-rod

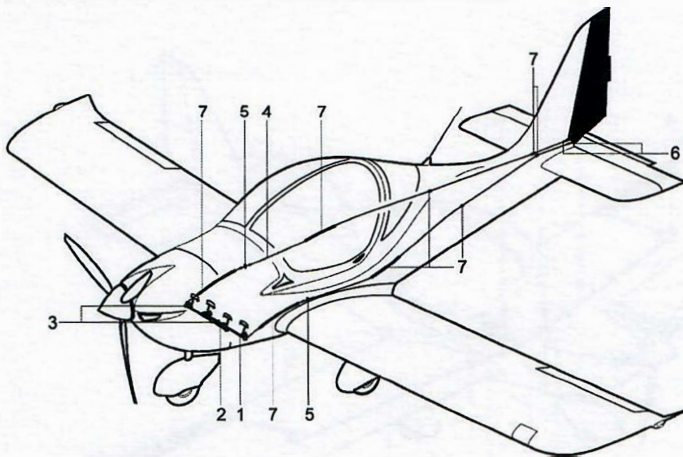
Figure 7-2 Lateral control



7.3.3 Rudder Control

Rudder control is controlled by pedals of foot control. The movement of the pedals is transferred to the rudder by the steel cables (4, Figure 7-3). The cables are attached to the left pedal of left foot control, to the right pedal of right foot control and to the attachments on the rudder. The route of cables of rudder control is led along the sides of the fuselage. The cables are led in the plastic guiding tubes (7) in the exposed places. The stops of cables are located in the area of fuselage frame No. 3.

The pedals of rudder control are connected with the nose landing gear by means of the adjustable pull-rods. The rudder deflecting and the nose landing gear steering are controlled via the movement of foot control pedals. The hydraulic pumps of brakes are also controlled by the foot control pedals.



Legend to Figure 7-3:

- | | | | |
|---|--------------------|---|-----------|
| 1 | Rear countershaft | 5 | Grommet |
| 2 | Front countershaft | 6 | End piece |
| 3 | Bearing | 7 | Tube |
| 4 | Cable | | |

Figure 7-3 Rudder control



The foot control pedals can be set in three positions

Adjustable foot control pedals NOT equipped with the remote position control

The steps to adjust the rudder pedals position:

1. Release the pin from the adjusting groove by pressing lever.
2. Set pedal to one of three possible positions.
3. Check on the pin locking-on in the adjusting groove.

WARNING

**RIGHT AND LEFT PEDAL OF RUDDER CONTROL
MUST BE ADJUSTED IN THE SAME POSITIONS
AND SECURED!**

Adjustable foot control pedals equipped with the remote position control

The steps to adjust the rudder pedals position:

WARNING

**THE RUDDER MUST BE IN NEUTRAL POSITION
BEFORE PEDALS ARE ADJUSTED! CHECK THAT
THE RUDDER IS CENTERED BEFORE
ADJUSTING!**

**DO NOT ADJUST FOOT CONTROL PEDALS
POSITION IN FLIGHT OR WITH ENGINE RUNNING!**

1. Check the engine is shut down.
2. Set the rudder in the neutral position (centered).
3. Assure the space aft of the rudder pedals (where your feet are positioned in flight) is clear, and no pressure is applied to the rudder pedals.
4. Pull the lever marked **ADJUSTABLE PEDALS LEVER** (located below the instrument panel on the RH and LH cockpit side), pedals will automatically move fully aft. Then release the lever.
5. Place feet on the pedals, apply light even pressure on pedals while slightly engaging the lever. The pedals will start to move forward.
6. Release lever and continue to push pedals forward using light even pressure. The pedals will automatically lock in the nearest position.
7. Repeat steps 4 and 5 to move pedals to the desired position.



7.3.4 Elevator Trim Tab Control

The elevator trim tab is located on the elevator trailing edge. It is controlled by the electromechanical strut connected with the angular lever on the trim tab via the pull-rod. In the upper part of both control sticks, there is a head with control buttons that serve for setting the trim tab deflections. The sense of control is: forwards (heavy on nose) or backwards (heavy on tail).

The electromechanical strut is mounted inside the elevator; the connector is attached to the bracket on the pull-rod of elevator control. The relative position of the trim tab is, in the case of the installation of analog instruments, indicated by the indicator on the instrument panel. The neutral position is located between the marks on the indicator.

7.3.5 Wing Flaps Control

The flap control lever is located between pilot seats. When a lock button located on the upper end of the lever is pressed, the lock pin is pulled out of the groove in the changing gate. The flaps can then be extended to a position for takeoff or landing (2 positions). The flap position is locked when the lock button is released.

The wing flaps are controlled by the manual lever **FLAPS** (1, Figure 7-4) that is located in the cockpit between the seats. The left wing flap (4) and the right wing flap (5) are connected by means of the torsion shaft (3). The pins on both ends of the torsion shaft fit in the guiding grooves in the end ribs of wing flaps. The deflection of the manual lever is transferred by the pull-rod (2) to the deflection of the angular lever on the torsion shaft. By swiveling the torsion shaft, the eccentric pins on the lever perform a circular movement and by the guiding grooves of the root ribs, they carry the wing flaps. The wing flaps are opened and closed by a sliding movement of the eccentric pins inside the grooves. The eccentricity of the pins allows the adjustment of wing flap setting by swiveling the pins.

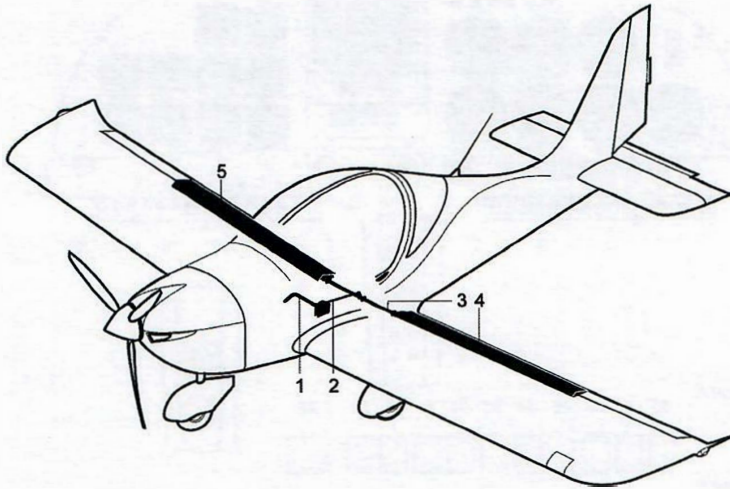
The position of the lever of wing flap control is locked by the pin in the slots of the slotted link mechanism. By pressing the button on the upper end of the lever, the locking pin slides out of the cutouts in the slotted piece. The wing flaps are locked and can be set to the required position. The position of wing flaps is locked by releasing the locking button when the pin fits in the cutout in the slotted piece.

There can be installed **FLAPS** amber warning light on the left side of the instrument panel. The **FLAPS** warning light is on when the wing flaps control lever is in position for takeoff or landing (2 positions).



The wing flaps can be set to four positions.

RETRACTED	0°
TAKEOFF	15°
LANDING (1 st position)	30°
LANDING (2 nd position).....	50°



Legend to Figure 7-4:

- | | |
|-----------------|---------------|
| 1 Lever | 4 Wing flap L |
| 2 Pull-rod | 5 Wing flap R |
| 3 Torsion shaft | |

Figure 7-4 Wing flaps control



7.4 Controls in the Cockpit and Instrument Panel

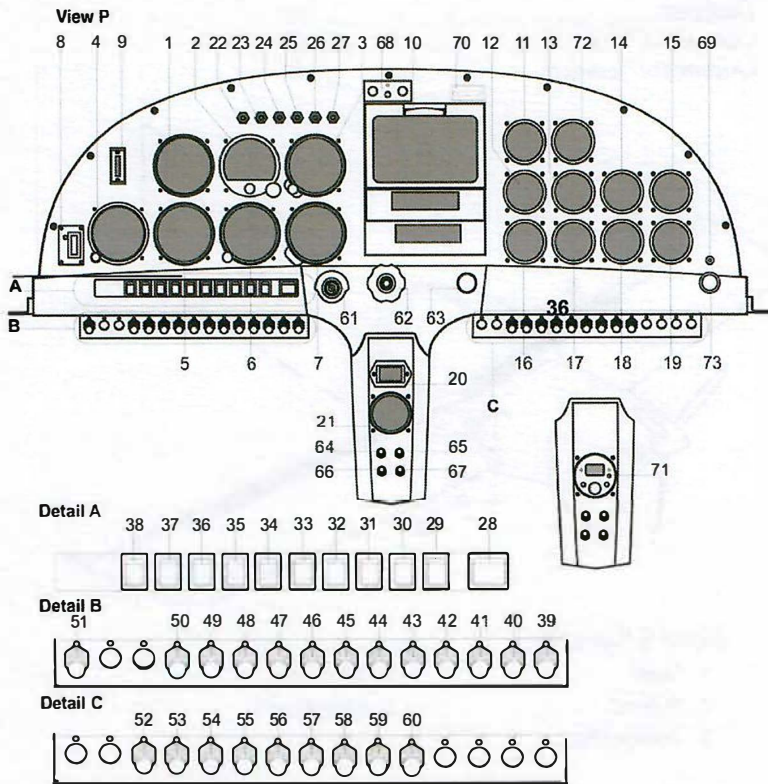


Figure 7-5 SportStar's RTC instrument panel – standard version

Legend to Figure 7-5:

- | | |
|---------------------------|-------------------------------------|
| 1 Airspeed indicator | 53 Socket 12 V |
| 2 Artificial horizon | Detail B - circuit breakers: |
| 3 Altimeter | 39 Accumulator (30 A) |
| 4 CDI indicator | 40 Flight clock (1 A) |
| 5 Turn and bank indicator | 41 Generator (25 A) |
| 6 Directional gyro | 42 Turn indicator (2 A) |



7	Vertical speed indicator	43	Artificial horizon (3 A)
8	ELT remote control	44	Direction gyro (3 A)
9	Trim indicator	45	Beacon / strobe lights (7.5 A)
10	COMM/NAV/GPS bay	46	Position lights (2 A)
11	Engine speed indicator	47	Landing light (4 A)
12	Oil temperature indicator	48	Fuel pump (3 A)
13	Cylinder head temperature ind. or Coolant temperature ind. – see Note on page 2-6	49	Signalling (1 A)
14	Fuel press indicator	50	Trim (1 A)
15	Voltmeter	51	Stall warning system (1 A)
16	Oil pressure indicator	Detail C - circuit breakers:	
17	Fuel quantity indicator	52	Engine speed indicator (1 A)
18	Fuel quantity indicator	53	Engine instruments (1 A)
19	Outside air temperature ind.	54	Fuel press / quantity ind. (1 A)
20	Engine hours indicator	55	Voltmeter / OAT (1 A)
21	Flight clock	56	COMM (1 A)
22	Pitot heating annunciator (if inst.)	57	NAV equipment (4 A)
23	Ground power source annunciator (if inst.)	58	ATC transponder (5 A)
24	Parking brake annunciator	59	Altitude encoder (2A)
25	Wing flaps annunciator	60	GPS (3A)
26	Opened canopy annunciator	61	Switch box
27	Charging annunciator	62	Throttle lever
Detail A – switches:		63	Choke lever
28	Master switch	64	Cold air lever
29	Avionics	65	Carburettor preheater lever
30	Turn indicator	66	Hot air lever
31	Artificial horizon	67	Air distribution lever: canopy/cockpit
32	Directional gyro	68	Intercom
33	Beacon	69	Audio input (if installed)
34	Position lights	70	ELT remote control – alter. location
35	Landing light	71	Flight clock – alternative location
36	Fuel pump	72	Engine boost air indicator
37	Intercom	73	Socket 12V



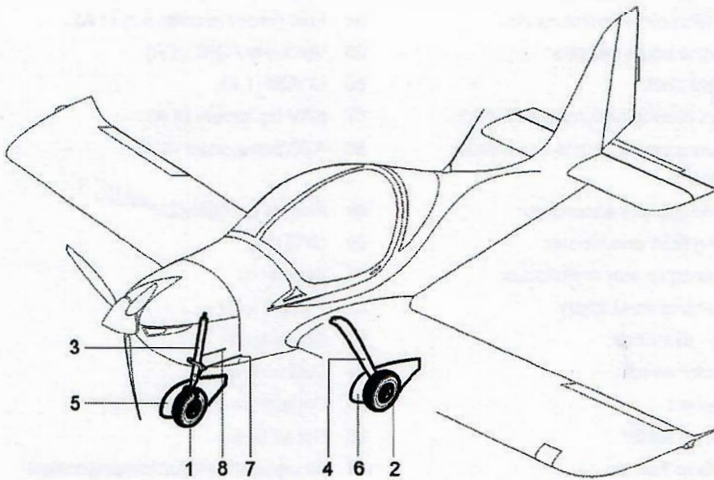
7.5 Inside and Outside Marking and Placards

Placard list and markings are mentioned in the Airplane Maintenance Manual for SportStar RTC airplane.

7.6 Landing Gear and Brakes

7.6.1 Landing Gear

The airplane is equipped with a sort of fixed nose landing gear. Main landing gear legs (4, Figure 7-4) are produced from composite spring. Nose landing gear leg (1) is welded from two pieces - the tube and the yoke- in which the nose wheel is mounted. The nose landing gear is spring-loaded by rubber blocks. The nose wheel is controllable, wheel control is coupled with rudder control by means of two pull rods (7, 8). Wheels can be fitted with fiber-glass aerodynamic pants (5, 6).



Legend to Figure 7-6:

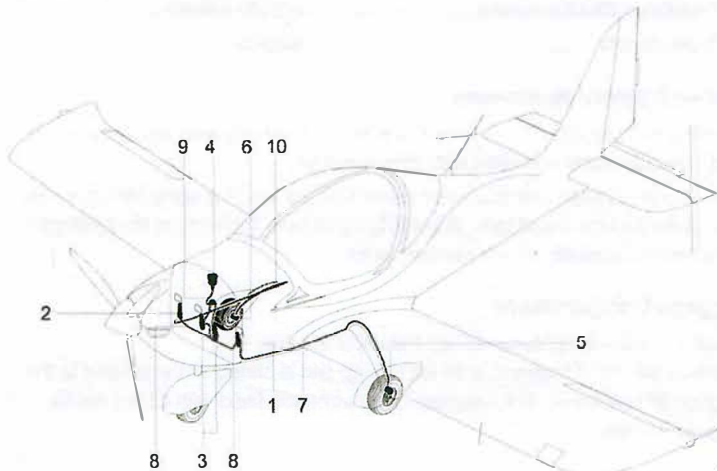
- | | | | |
|---|-----------------------|------|-------------------------|
| 1 | Nose wheel | 5 | Nose wheel part |
| 2 | Main wheel with brake | 6 | Main wheel part |
| 3 | Nose landing gear leg | 7, 8 | Nose wheel control rods |
| 4 | Main landing gear leg | | |

Figure 7-6 Landing gear



7.6.2 Brakes

The SportStar RTC airplane is equipped with disk hydraulic brakes on main landing gear wheels (Figure 7-7). Brake system is composed of brake pedals (these are a part of rudder control pedals), brake pumps (1, 2, 3), hoses for leading brake liquid (7, 9, 9, 10), brake yokes with wheel cylinders and brake pads. By depressing the brake pedals compression of brake pumps occurs, which generates pressure in brake circuit and hydraulic cylinders press the brake pads onto the brake disks. Braking pressure can be regulated only by force of brake pedals depressing.



Legend to Figure 7-7:

- | | |
|-------------------------|------------------------------|
| 1 Brake pump | 6 Right wheel brake |
| 2 Brake pump | 7 Hose to left wheel brake |
| 3 Brake pump | 8 Brake liquid hose |
| 4 Brake fluid reservoir | 9 Brake liquid hose |
| 5 Left wheel brake | 10 Hose to right wheel brake |

Figure 7-7 Braking system

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The mechanical manually controlled parking brake is installed in the airplane.

PARKING BRAKE handle is located below the left pilot seat.

Applying parking brake

1. Brake pedals.....press and hold
2. **PARKING BRAKE** handlepull to brake
3. Brake pedalsrelease

Releasing parking brake

1. Brake pedals.....press and hold
2. **PARKING BRAKE** handlepush to release
3. Brake pedalsrelease

7.7 Seat and Safety Harnesses

SportStar RTC airplane is a two-seat airplane with side-by-side seats. Seats are fixed, non-adjustable and fitted with light upholstery.

Each of seats is fitted with four-point safety harness which is composed of safety belts, shoulder straps and lock. The safety harness is anchored in the fuselage sides behind the seats and on the seat sides.

7.8 Baggage Compartment

Baggage compartment is positioned behind seat rests.

Maximum weight of baggage is 55 lbs (25 kg) and is stated on the placard in the baggage compartment. The baggage compartment is fitted with rubber net for baggage fixation.

7.9 Canopy

The cockpit canopy is of a semi drop shape. The framework is made of composite. The organic glass is glued to the canopy composite frame.

The canopy is attached to the fuselage in the front part by two swivel pins by means of which it can be folded up forwards. In order to make opening easier, the actual weight of canopy is balanced by two gas struts, besides the canopy is provided with holders on the lower framework for easier handling. The canopy is provided with the lock in the rear upper part of framework for locking.



7.10 Power Unit

7.10.1 General

The engine ROTAX 912 ULS (100 hp) is used to power SportStar RTC airplane. ROTAX 912 ULS is a four-cylinder, four-stroke engine with opposite cylinders, central cam shaft, OHV valve mechanism and maximum take-off power of 100 hp (73.5 kW) at 5800 RPM.

The on-ground adjustable, composite, 3-blade propeller WOODCOMP KLASSIC 170/3/R. is standard mounted on the engine ROTAX 912 ULS.

7.10.2 Engine Control

Engine power is controlled by means of **THROTTLE** lever, which is located in the middle of the instrument panel and which controls engine power range from idle up to maximum take-off. Engine power controller is mechanically interconnected with the flap on carburetors.

If the throttle lever is fully pushed in, then this position corresponds to maximum engine power. If the throttle lever is fully pulled out, then this position corresponds to idle (1600 – 1700 RPM set by airplane manufacturer). Rapid changes in engine power setting can be made by pressing down the round button on the lever body and by its pulling out or pushing in. Small changes in power setting can be performed through lever turning (clockwise - power increase).

WARNING

DO NOT APPLY AN EXCESSIVE FORCE IF THE THROTTLE LEVER IS CLOSE TO FULLY PULLED POSITION, OTHERWISE IT CAN CAUSE DAMAGE TO THE THROTTLE LEVER.

In the case of a throttle control damage as a result of excessive tightening when the controller starts "skipping" due to a stripped thread, then such "skipping" can lead to an increase of the engine idle speed.

The throttle lever is fitted with the locking ring, clockwise turning of which ensures locking of the lever in requested position.



7.10.3 Engine Instruments

The following instruments located on the instrument panel serve for engine performance monitoring:

RPM indicator

The electrical RPM indicator is controlled by signal from the generator RPM transmitter. Working range of the RPM indicator is 0 - 8000 RPM. Color code is stated in section 2, page 2-6.

Cylinder head or coolant thermometer – see Note on page 2-6

The cylinder head or coolant thermometer transmitter senses temperature of cylinder No. 3 or coolant of cylinder No. 3. Working range of the thermometer is $50 \div 150$ °C. Color code is stated in section 2, page 2-6.

Oil thermometer

Oil temperature on engine input is measured by the sensor located behind the oil pump. Working range of oil thermometer is $50 \div 150$ °C. Color code is stated in section 2, page 2-5.

Oil pressure indicator

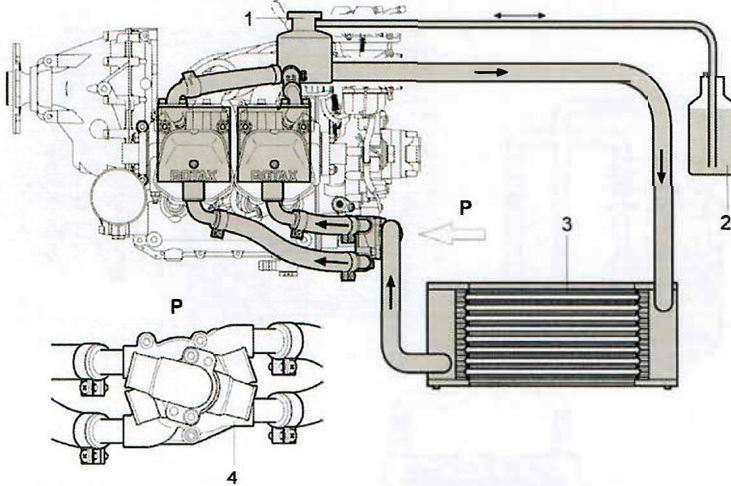
Oil pressure on the oil input into engine is measured by means of sensor which is located behind the oil filter. Working range is $0 \div 10$ bar. Color code is stated in section 2, page 2-5.

7.10.4 Engine Cooling System

Engine cooling is combined, cylinder heads are cooled by water, and cylinders are cooled by air.

Cooling circuit of cylinder heads is designed as a closed system containing pump, expansion tank (1) with pressure closure, cooling liquid cooler (3) and overflow bottle (3). Scheme of cylinder head cooling system is shown in Fig. 7–8.

When changing, the cooling liquid is filled up through the cap of expansion tank (1), during airplane operation it is replenished into overflow bottle (3) between the lines of maximum and minimum level.



Legend to Figure 7-8:

- | | | | |
|---|-----------------|---|-----------------------|
| 1 | Expansion tank | 3 | Cooling liquid cooler |
| 2 | Overflow bottle | 4 | Pump |

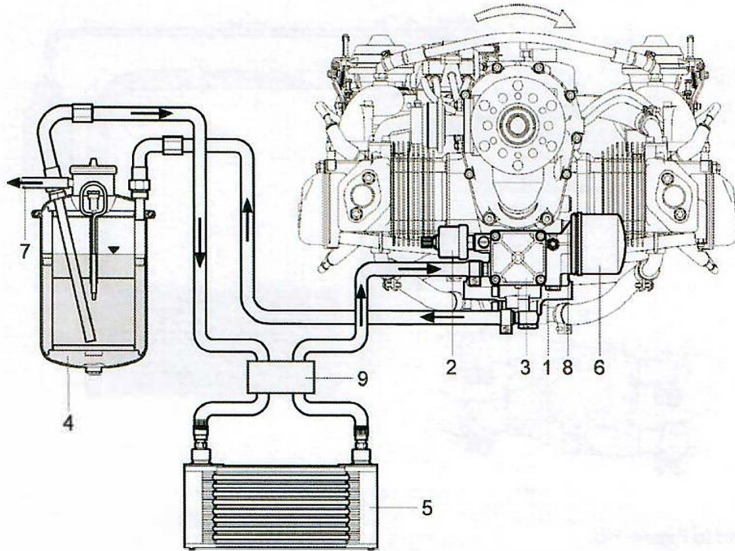
Figure 7-8 Scheme of cylinder head cooling system

7.10.5 Engine Lubrication System

The engine is equipped with the lubrication system with the dry sump and the oil pump that has a built-in pressure reducing valve (1, Figure 7-9) and a sensor of oil pressure (2). The oil pump (3), that is driven by the camshaft, takes the engine oil from the tank (4) through the thermostat (9), oil cooler (5) and the oil is forced through the oil filter (6) to the individual lubrication points in the engine. The oil flows down from the lubrication points to the bottom of the crankcase, and from there it is forced to the oil tank by means of the pressure shocks from the pistons. The venting of the system is realized by the outlet (7) on the oil tank.

The sensor of oil temperature (8) is located on the pump body and it measures the oil temperature on the inlet; the sensor of oil pressure (2) is installed along with the pressure reducing valve in the oil pump.

Oil pressure and temperature are indicated on instruments in right side of the instrument panel. Oil is replenished through the lid in the upper part of the oil tank (4).



Legend to Figure 7-9

- | | |
|--------------------------|-----------------------------|
| 1 Reduction valve | 6 Oil filter |
| 2 Sensor of oil pressure | 7 Venting of oil system |
| 3 Oil pump | 8 Sensor of oil temperature |
| 4 Oil tank | 9 Thermostat |
| 5 Oil cooler | |

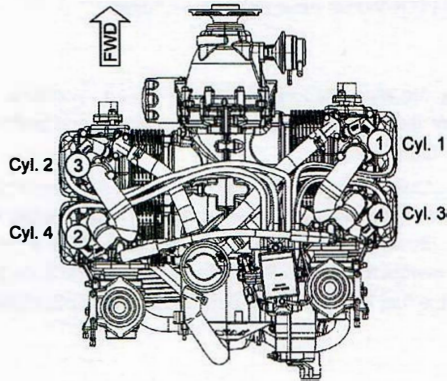
Figure 7-9 Scheme of engine lubrication system

7.10.6 Engine Intake System

Engine intake system ensures delivery of sufficient air into engine. Air is taken into the engine through openings on the engine covers through the air filters. The intake system can be equipped with carburetor heating system. Hot air from the heat exchanger (located on the exhaust collector) is taken to the mixing chamber. Amount of in-taken hot air is regulated by flaps in mixing chamber inlets. Flaps are controlled by the **CARBURET. PREHEAT.** knob on the instrument panel.

**7.10.7 Ignition System**

The engine is equipped with the double contactless ignition system. Each ignition circuit has own source of energy, control unit, 2 ignition coils and 4 spark plugs. It is fully autonomous on the other circuit of accumulator. High voltage current is distributed to the spark plugs through high-voltage cables. Ignition sequence of individual engine cylinders: 1-4-2-3.

**Figure 7-10** Ignition sequence

Ignition circuits are controlled by the ignition switch on the instrument panel.

Positions of ignition switch:

- | | |
|--------------|---|
| OFF | engine ignition is off |
| R | only ignition circuit B is on |
| L | only ignition circuit A is on |
| BOTH | both circuits are on |
| START | both circuits are on and starter is cranking the engine |



7.11 Fuel System

Fuel system serves for keeping fuel in the airplane and it's feeding to the engine. Fuel system of SportStar RTC airplane is composed of integral fuel tanks (1, 2 Figure 7-11), fuel line, fuel selector (4), check valve (5), fuel filter (5), mechanical fuel pump - located on the engine (11), electrical fuel pump (6), distributors (9, 10), distribution pipes of fuel with return branch, fuel gauges (13, 14), fuel pressure indicator (12) and fuel tanks draining valves (15). Overflow fuel from engine fuel pump (11) is led via hose under the aircraft.

7.11.1 Fuel Tanks

Fuel is contained in the wing integral tanks (1, 2) having volume 60 l each. Each tank is fitted with air venting (output is under the wing tip) and draining valve (15) on the bottom side of the wing.

Fuel is led from the tanks through the hoses to the fuel selector (4) located on a central console under the instrument panel and then through a fuel filter (5), the fuel pumps (6, 11), distributors (9, 10) to the carburetors (7, 8). Fuel return hose goes from the fuel distributor (9) into the fuel selector (4) and from there to fuel tanks (1, 2) which the fuel is drawing off. See figure 7-11 for Scheme of fuel system.

7.11.2 Fuel Selector

The fuel selector (4) serves for tank selection and fuel delivery interruption in case of engine fire or long parking of airplane.

To move selector from **OFF** (closed) position it necessary pull the safety button on the fuel selector, turn the handle from the **OFF** position to the left and then release safety button. Now the handle can be freely moved between **LEFT** and **RIGHT** position. Safety button prevents unintentionally switch the selector to **OFF** position.

To move selector to **OFF** (closed) position it is necessary pull the safety button on the fuel selector, turn the handle to the **OFF** position and then release safety button. Now the handle is blocked in the **OFF** position. Safety button prevents unintentionally switch the selector from the **OFF** position during parking.

7.11.3 Fuel Filter

The fuel filter (5) separates all mechanical impurities from fuel. The fuel filter is located in the cockpit on the left airframe panel.

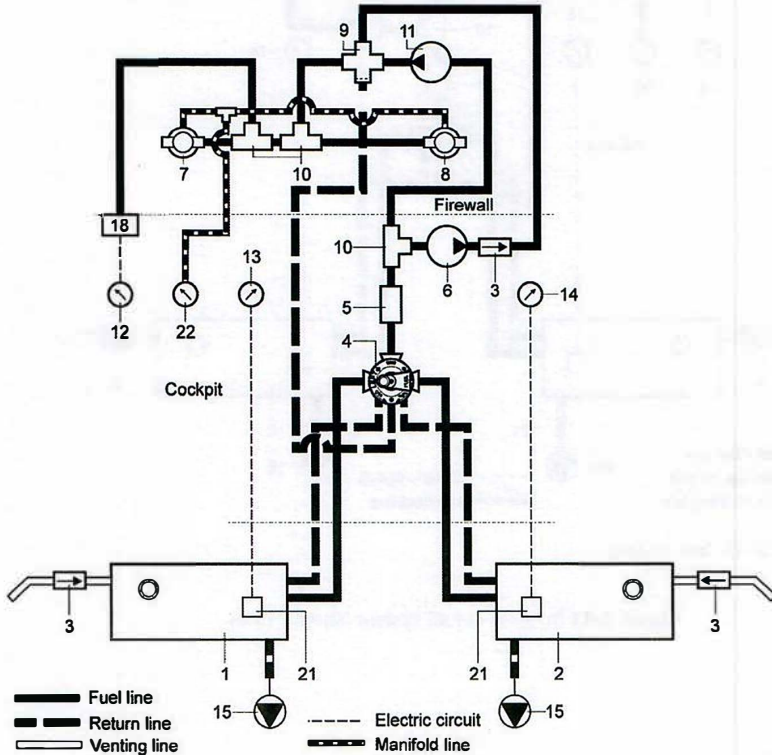


7.11.4 Indication of Fuel Quantity

Fuel quantity is measured by a float fuel gauge sensor (21) in each tank and indicated on fuel gauges (13, 14) on the instrument panel. LH fuel gauge indicates fuel quantity in the left tank, RH indicator in the right tank. True fuel quantity is indicated only on ground and in level flight and it takes approx. 2 minutes to level fuel after transition from climb/descent.

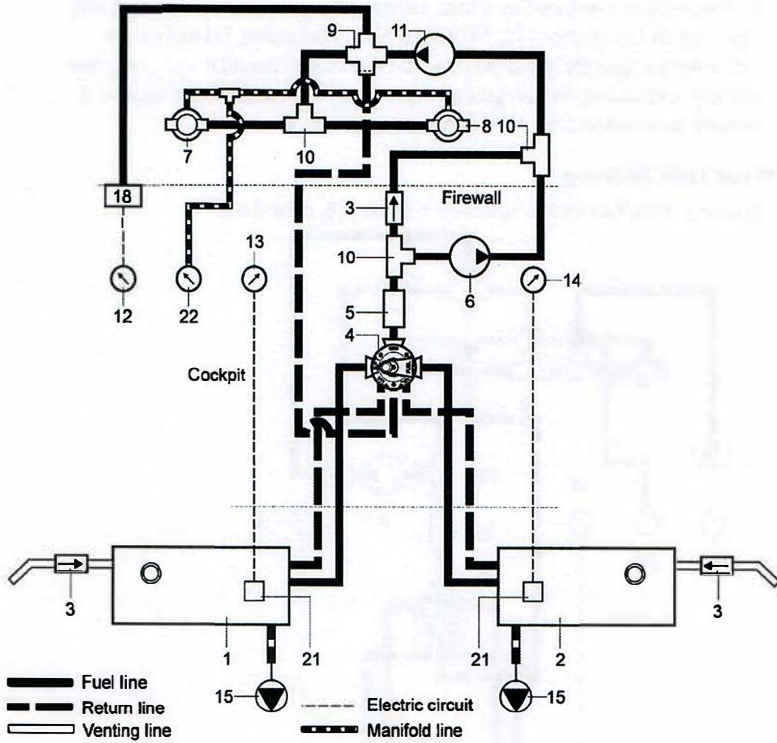
7.11.5 Fuel Tank Draining

Draining of the fuel tank is specified in Section 8, para 8.5.2.



Original version of the fuel system

Figure 7-11 Scheme of fuel system (sheet 1 of 3)



New version of the fuel system

Figure 7-11 Scheme of fuel system (sheet 2 of 3)



Legend to Figure 7-11

- | | |
|--------------------------|---|
| 1 Left fuel tank | 12 Fuel pressure indicator |
| 2 Right fuel tank | 13 Fuel quantity indicator of left tank |
| 3 Check valve | 14 Fuel quantity indicator of right tank |
| 4 Fuel cock | 15 Drain valve |
| 5 Fuel filter | 16 - |
| 6 Electric fuel pump | 17 - |
| 7 Left carburetor | 18 Fuel pressure sensor |
| 8 Right carburetor | 19 Manifold pressure sensor (only if the adjustable propeller installed) |
| 9 Four-way distributor | 20 Flow meter |
| 10 Three-way distributor | 21 Fuel level sensor in tank |
| 11 Engine fuel pump | 22 Manifold pressure indicator (only if the adjustable propeller installed) |

Figure 7-11 Scheme of fuel system (sheet 3 of 3)



7.12 Electrical System

The airplane is equipped with 14 V DC electrical installation (see Figure 7-12). A generator with power of 250 W is the primary source of electrical energy. The secondary source of energy is the accumulator 12V/15Ah(12V/20Ah optionally) that is located in the engine compartment on the fire wall. It is used for engine starting and in case of generator failure as an emergency source of energy and also serves as the smoothing filter of power system.

DC voltage is distributed to individual systems by main bus bar. Each system is protected by circuit breaker. If overloading of any of the circuits occurs, then the circuit breaker is pulled out. Circuit breakers are listed in the Aircraft Maintenance.

CAUTION

DO NOT USE CIRCUIT BREAKERS FOR NORMAL SWITCHING OFF OF THE SYSTEMS.

After switching **MASTER SWITCH** on and by turning the ignition key to **START** position the starter is activated. The starter is power supplied from the accumulator before engine start. After engine has been started and idle RPM reached, generator starts supplying current into electrical network.

7.12.1 Lighting

Airplane can be equipped with an external lighting.

External lighting can be composed of position lights and anti-collision beacons which are located in wing tip and landing headlight which is located in left wing leading edge or in the lower engine cowling. Position lights are switched by **POS. LIGHTS** switch and anti-collision beacon by **BEACON** switch. Landing headlight is switched by **LDG LIGHT** switch.



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Section 7
Airplane and System
Description

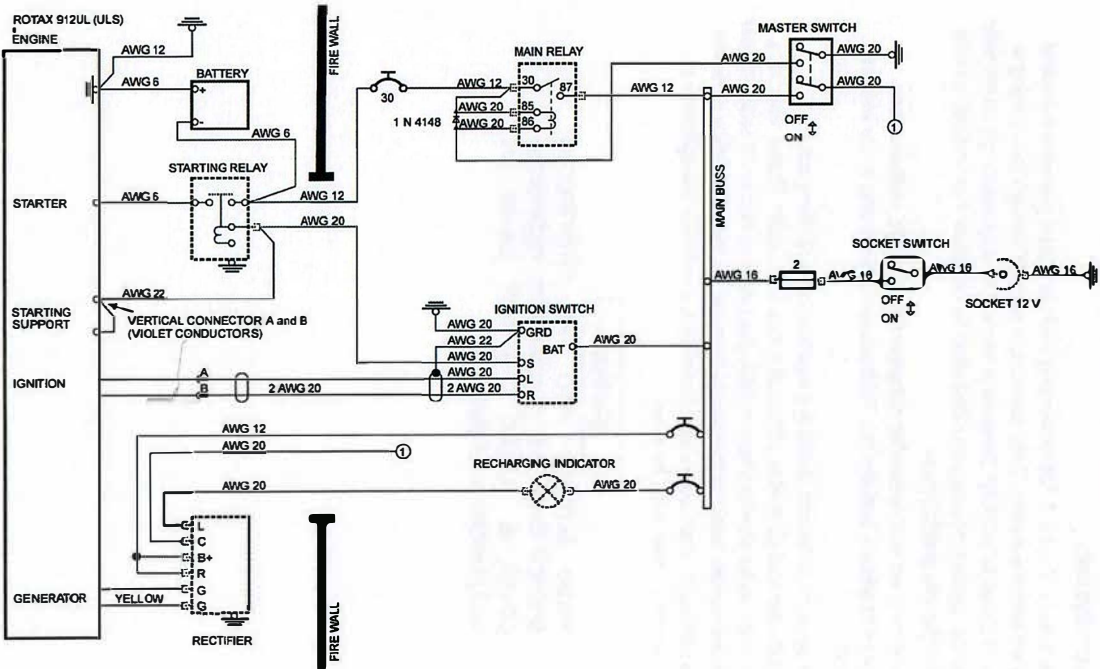


Figure 7-12 Scheme of electrical system



7.13 Pitot-static System

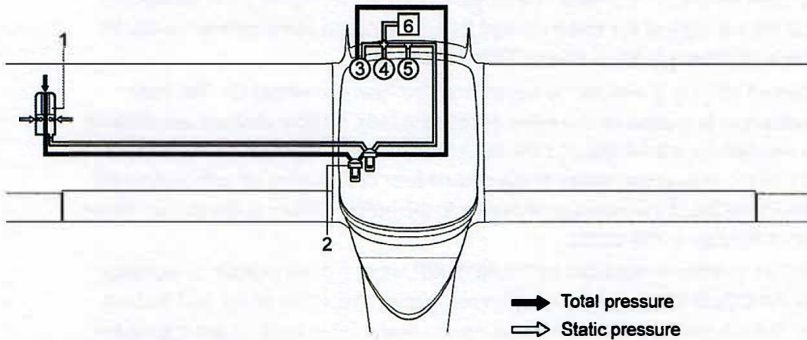
Pitot-static tube (1, Figure 7-13) for sensing static and total pressure is located under the left half of the wing. Total pressure is sensed through the opening in the Pitot-static tube face. Static pressure is sensed through openings on the tube circumference. System of pressure distribution to individual instruments is made by means of flexible plastic hoses.

Static pressure is led to altimeter (5), airspeed indicator (3), vertical speed indicator (4) and altitude encoder (6). Total pressure is led only to the airspeed indicator (3).

Both hose systems (total and static) are equipped with draining sumps (3) located inside the cockpit in front of the left pilot's seat under. These reservoirs are visible and can be checked from outside the fuselage bottom. If water appear in the draining sumps, unscrew the covers from the sumps and slightly blow into the Pitot-static head. Then screw the covers back and check the tightness of pitot-static system – see AMM for details.

CAUTION

AVOID BLOWING INTO THE PITOT-STATIC SYSTEM WITH THE CONDENSATE RESERVOIR COVER IS CLOSED - IT MAY CAUSE AN INSTRUMENT MALFUNCTION.



Legend to Figure 7-13

- | | |
|----------------------|----------------------------|
| 1 Pitot-static tube | 4 Vertical speed indicator |
| 2 Drain sumps | 5 Altimeter |
| 3 Airspeed indicator | 6 Altitude encoder |

Figure 7-13 Scheme of pitot-static system

7.14 Supplementary Equipment

7.14.1 Stall Speed Warning System

The sensor of stall speed warning is located on the left wing leading edge. When approaching the critical angle of attack (stall speed proximity) the flap is reset and electrical circuit connected as a result of pressure differences acting on the front and the rear part of the flap. During stall speed warning the acoustic signaling is activated which lasts throughout the time of occurrence.



7.14.2 Ventilation and Heating System

Cockpit ventilation is ensured by 2 eye-ball vents (14, Figure 7-14) located on the left and right of the tip-up canopy frame. Vents are connected to the NACA inlets (14) through tip-up canopy frame front flaps.

Cockpit heating is ensured by hot air from the heat exchanger (2). The heat exchanger is located on the exhaust collector (18). Air from ambient atmosphere is warmed up in the exhaust collector and then led through the mixing chamber (6) on the firewall and hoses to the cockpit floor or to the hot air outputs through the instrument panel cover as well as into the hollow spaces in the canopy frame for canopy glass defrosting.

Hot air quantity is regulated by the **HOT AIR** knob, cold air quantity is regulated by the **COLD AIR** knob on the instrument panel. Proportion of the cold and hot air in the heating system can be set continuously. Other knob on the right of the **HOT AIR** knob serves for air routing to the cockpit floor or on the canopy glass.

Legend to Figure 7-14

- | | |
|--------------------|--------------------------|
| 1 Air inlet | 11 Hose |
| 2 Heat exchanger | 12 Hose |
| 3 NACA inlet | 13 Hose |
| 4 Hot air chamber | 14 NACA inlet |
| 5 Cold air chamber | 15 Eye-ball vent |
| 6 Mixing chamber | 16 Air outlets |
| 7 Hose | 17 Controls |
| 8 Hose | For information: |
| 9 Hose | 18 Exhaust collector |
| 10 Hose | 19 Cooling liquid cooler |

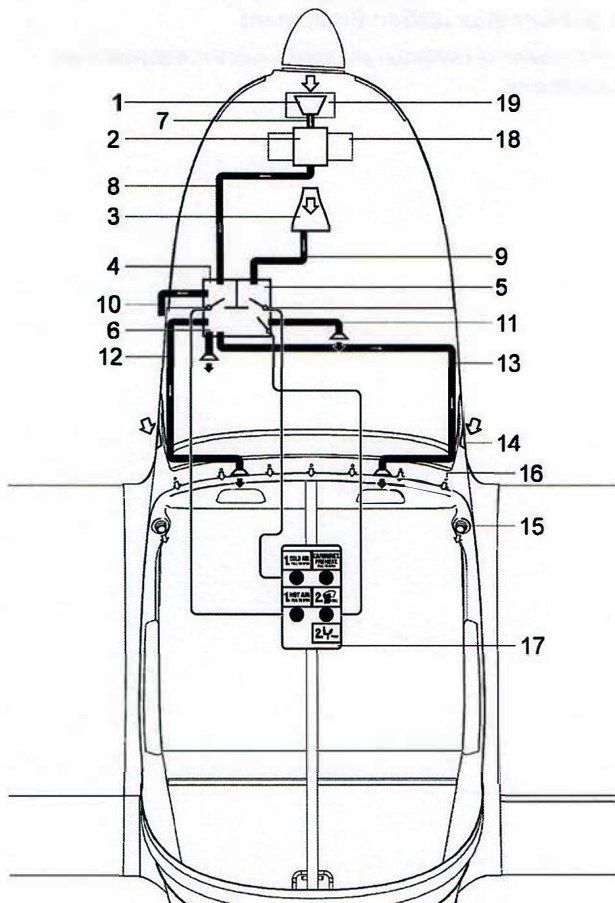


Figure 7-14 Scheme of ventilation and heating system



7.15 Navigation and Communication Equipment

Descriptions of operation of navigation and communication equipment see section 9 - Supplements.



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Section 8

Airplane Handling, Servic.
and Maintenance



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8.1 Introduction

This section includes the procedures for airplane handling, maintenance and operation recommended by the manufacturer.

It is necessary to follow the set-down lubrication plan, scope and periodicity of preventive maintenance depending on climatic and flight conditions according to the Aircraft Maintenance Manual of SportStar RTC airplane.

Airplane owner should be in a permanent touch with the manufacturer, either directly or through the network of business representatives, which enables him to get the newest information concerning airplane operation, handling and maintenance. The manufacturer distributes this information to users through Service bulletins (Mandatory bulletins), Information bulletins (letters) and further instructions.

Mandatory bulletins are especially important for keeping up airworthiness and the manufacturer considers them mandatory although they do not come into effect before Airworthiness Directive is issued by aviation authority of user's country.

All correspondence with the airplane manufacturer, distributor or service center must contain the **airplane serial number**. The airplane serial number is shown on the title sheet of this manual and on the production plate behind the rest of pilot seats.

The manufacturer delivers along with the airplane "Pilot's Operating Handbook for SportStar RTC" and the "Airplane Maintenance Manual for SportStar RTC".

8.2 Airplane Inspection Period

Periodical inspections and reviews of airplane must be carried out at the latest in the following intervals:

- After first 25 ± 2 hours of operation
- After first 50 ± 3 hours of operation
- After every 100 ± 5 hours of operation
- Annual inspection

Details on periodical inspections are provided in the Airplane Maintenance Manual for SportStar RTC.

Refer to the Rotax 912 Maintenance Manual for engine maintenance.

Refer to the Propeller Maintenance Manual for propeller maintenance.



8.3 Modifications or Airplane Repairs

All airplane repairs and modifications of airplane must be carried out by qualified personnel in an approved service center.

Before any repairs/modification is made to the aircraft, consult the Civil aviation authority of the country in which the airplane is registered to assess effect of the repair/modification on the airworthiness.

Basic repairs of airplane are described in the Airplane Maintenance Manual for SportStar RTC.

8.4 Road Transport

8.4.1 Airplane Towing

It is possible to move the airplane on a short distance by holding the fuselage end in the position before the fin, eventually by holding the root part of wings.

The hand towing bar can be used for airplane relocation which will be fastened to the nose wheel axis.

To turn the airplane on the spot, push on the fuselage end part in the area before the fin, lift the nose wheel and turn the airplane in required direction.

WARNING

**SWITCH OFF IGNITION BEFORE GROUND
HANDLING WITH THE AIRPLANE!**

CAUTION

AVOID EXCESSIVE PRESSURES ON THE AIRFRAME STRUCTURE, ESPECIALLY ON THE WING TIPS, HTU, AND VTU ETC.

WHEN HANDLING THE AIRPLANE BY MEANS OF THE TOWING BAR, PROPELLER BLADES MUST BE SET TO HORIZONTAL POSITION. MAXIMUM DEFLECTION OF THE NOSE WHEEL IS $\pm 10^\circ$.

AT MANUAL ENGINE STARTING GRASP THE PROPELLER BLADE AREA, I.E. NOT ONLY PROPELLER EDGE.



8.4.2 Airplane Parking

It is the most suitable solution to place the airplane into a hangar possibly into another covered room with stable temperature, good venting, low humidity and dust-free environment. In case of parking out of the hangar it is necessary to anchor the airplane and at long-term parking to cover the canopy, possibly the whole airplane with suitable tarpaulins.

8.4.3 Airplane Anchoring

The airplane is anchored at parking out of hangar after termination of flight day or according to need. Anchoring of the airplane is necessary for its protection against possible damage, caused by wings and gusts. For this purpose the airplane is equipped with fixing eyes on the lower side of wings.

Procedure:

1. Check of fuel selector, off-position of all switches, ignition and master switch.
2. Lock manual control, e.g. by using safety belts.
3. Release parking brake
4. Close and lock the cockpit canopy
5. Place wheel chocks
6. Anchor the airplane to the ground by means of cables pulled through fixing eyes which are located on the lower side of wings. Further it is necessary to anchor the nose landing gear.

NOTE

In case that long-term airplane anchoring is supposed, namely in winter period, it is suitable to cover the canopy, eventually the whole airplane by appropriate tarpaulins which must be properly secured to the airplane structure.

8.4.4 Airplane Jacking

Airplane jacking presents no big difficulties due to relatively low airplane empty weight and can be performed by two persons.

On the bottom of the fuselage there are three jacking points intended for placing jacks. Jacking points are marked with **SUPPORT HERE** placards.

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The airplane can be jacked in the following way:

- By pushing from the above to the fuselage rear part in the position before the fin the front part of fuselage can be jacked and subsequently supported under the fire wall.
- Rear part of fuselage can be slightly jacked only by grasping in the position near the auxiliary skid and by pushing from below and then the lower part of fuselage can be supported by the rest located in the area of the skid.
- Wings van is jacked by pushing on the wing from below in the area of the main spar. It is necessary to avoid jacking by grasping the wing tip.

8.4.5 Leveling

Leveling procedure is described in the Airplane Maintenance Manual for SportStar RTC.

8.4.6 Road Transport

The airplane can be transported on communication after its loading on an appropriate trail. It is necessary to dismount wings. The airplane must be secured against possible movement. This way you will preclude possible damage to the airplane.



8.5 Airplane Servicing

8.5.1 Airplane Fuelling

8.5.1.1 Approved Fuel Grades

Approved fuel grades are stated in Section 2, para 2.13.2 Approved Fuel Grades.

8.5.1.2 Fuelling Procedure

WARNING

NO SMOKING OR OPEN FLAMES DURING FUELING!

FIRE EXTINGUISHER SHOULD BE WITHIN REACH!

UNDER NO CIRCUMSTANCES ADD FUEL WITH THE ENGINE RUNNING!

NO PERSON ALLOWED IN THE COCKPIT DURING FUELING!

1. Connect the airplane to ground.
2. Open fuel tank cap.
3. Fill airplane with necessary amount of fuel.
4. After fuelling, wipe the remaining fuel out of the fuelling neck and close the fuel tank cap.
5. Disconnect the airplane from ground.
6. Perform the fuel draining procedure.

8.5.2 Draining of the Fuel Tank and Fuel Filter

Draining should be done after each airplane fuelling and prior to first flight each day.

There is a drain valve of each wing tank located on its bottom.

Procedure:

1. Put a transparent cup under the drain valve.
2. Open the drain valve by pressing in.
3. Drain required quantity of fuel.



NOTE

Fuel tank draining serves to elimination of impurities and deposits from the fuel. Drain until clean fuel flows from the drain valve.

4. Repeat procedure for the opposite tank.

8.5.3 Oil Refilling

8.5.3.1 Recommended Oil Brands

The recommended oil brands are listed in latest issue of Service Instruction SI-912-016.

8.5.3.2 Oil Filling Procedure

1. Check oil quantity in the oil tank.

NOTE

Before the check oil quantity, turn the propeller by hand (ignition must be switched OFF!) in the sense of engine rotation so that oil can fill in the engine space or operate the engine for 1 minute in idle mode. Oil level must lie between min and max marks (flattening) on the dipstick.

2. Remove the upper engine cowling.
3. Fill appropriate amount of oil so the oil level is between min and max marks.

CAUTION

ALWAYS REFILL SAME OIL BRAND THAT IS IN OIL SYSTEM.

4. Close the cap of the oil tank and install the upper engine cowling.

8.5.4 Coolant Refilling

8.5.4.1 Coolant Types

Refer to the Rotax 912 Operator's Manual for recommended coolant types.

**8.5.4.2 Coolant Filling Procedure**

1. Remove the upper engine cowling.
2. Fill appropriate amount of coolant into the reservoir located in the engine compartment.
3. Install the upper engine cowling.

8.5.5 Brake Fluid Refilling**8.5.5.1 Recommended Types**

Refer to the Airplane Maintenance Manual for SportStar RTC airplane for recommended brake fluid types.

8.5.5.2 Brake Fluid Refilling Procedure

1. Remove the upper engine cowling.
2. Fill the brake fluid into reservoir located in the engine compartment on the firewall. A brake fluid level must be approx. 25 mm in the reservoir.
3. Step repeatedly on the pedal during refilling.
4. Bleed the system after refilling.
5. Install the upper engine cowling.

8.6 Cleaning and Care

Always use appropriate cleaning agents when cleaning airplane surface.

Residuum of oil and fat can be removed from the airplane surface (excluding the canopy) by suitable detergents, possibly by petrol.

The canopy only to be cleaned by washing with ample stream of tepid water with addition of appropriate detergents. Use soft rag, sponge or wash leather. Use suitable polishing agent after wiping rests of water.

CAUTION

**NEVER DRY-CLEAN THE CANOPY AND NEVER
USE PETROL OR CHEMICAL SOLVENTS!**

Coating, upholstery and carpets in the cockpit can be removed from the cockpit, brushed and, if need be, cleaned with warm water with addition of appropriate detergent. Dry up upholstery after doing this.



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**9.1 Introduction**

This section contains the appropriate supplements necessary to safely and efficiently operate the airplane when equipped with various optional systems and equipment not provided with the standard airplane.

9.2 List of Inserted Supplements

Instal.	Date	Doc. Number	Title of Inserted Supplement
	2012-02-29	ERTC020-10-AS-001	Equipment list
	2012-02-29	ERTC020-10-AS-002	Garmin SL40 Transceiver
	2012-02-29	ERTC020-10-AS-003	PM3000 Intercom
	2012-02-29	ERTC020-10-AS-004	Garmin GTX 328 Transponder
	2012-02-29	ERTC020-10-AS-005	AK-451 Emergency Locator Transmitter
	2012-02-29	ERTC020-10-AS-006	Astrotech LC-2 Flight Clock
	2012-02-29	ERTC020-10-AS-007	Garmin Area 500 GPS Receiver
	2012-02-29	ERTC020-10-AS-008	Magnum Speed Soft 601 Prachute Rescue System
	2012-02-29	ERTC020-10-AS-009	Becker AR 6201 VHF Transceiver
	2012-02-29	ERTC020-10-AS-010	Becker BXP 6401-2 ATC Transponder
	2012-03-16	ERTC020-10-AS-011	Rotax 912 S Engine installed into SportStar RTC airplane
	2012-03-16	ERTC020-10-AS-012	GPS Receiver Flymap L
	2012-03-16	ERTC020-10-AS-013	Auxiliary Generator SD-20
	2014-03-17	ERTC020-10-AS-014	Airplane equipment and modification for S/N 20121504 and 20121505
	2012-07-02	ERTC020-10-AS-015	Garmin SL30 COM/NAV/LOC/ILS Receiver
	2013-03-15	ERTC020-10-AS-016	Garmin GNC 255A / 255B COM/NAV/LOC/ILS Receiver
	2014-03-17	ERTC020-10-AS-017	DYNON SKYVIEW EFIS/EMS System with SV-D1000 and SV-D700 Displays
	2014-03-17	ERTC020-10-AS-018	Garmin GTN 750 GPS/NAV/COM Receiver
	2014-03-17	ERTC020-10-AS-019	External Power Source Socket E7 68-91 01
	2015-02-18	ERTC020-10-AS-020	Installation of Garmin GTR 225A VHF COMM
	2015-02-27	ERTC020-10-AS-021	Data recorder Safetyplane V5
	2015-04-07	ERTC020-10-AS-022	Emergency Locator Transmitter Artex ME406
	2015-07-30	ERTC020-10-AS-023	Woodcomp KW-31-033 In-Flight Adjustable Propeller
	2016-04-22	ERTC020-10-AS-025	Emergency Locator Transmitter KANNAD AF INTEGRA



9.3 Supplement Inserted





Supplement No. 1

Equipment List

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	29.02.2012

This Supplement must be contained in Pilot's Operating Handbook.

Information contained in this Supplement ads or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under initial certification approval EASA.A.592 dated 24.5.2012.



Log of Revisions

Rev. No.	Affected Pages	Description	EASA Approved / Date	Inserted / Date



Section 1 – General Information

This Supplement adds information necessary for airplane operation with installed equipment, shown in this supplement.

Explanation

The column "No." in the table shows the number of pieces on the airplane corresponding to the line item. Equipment is shown in more lines in the case of a different location on the airplane.

The column "Weight" in the table shows the weight of one piece of the item installed on the airplane.

The column "Arm" in the table shows the distance of the item from the datum plane, i.e. the leading edge of the wing. The sign "-" shown at the arm numeric value means that the item lies at an appropriate distance before the datum plane. If there is no sign indicated, then the item lies in an appropriate distance after the datum plane.

The sign "✓" in the column "Installed" means that the item is physically located on the airplane.

Section 2 – Limitations

Not Affected.

Section 3 – Emergency Limitations

Not Affected.

Section 4 – Normal Procedures

Not Affected.

Section 5 – Performance

Not Affected.



Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	Engine	Rotax 912 ULS	1	61	-1.036	✓
2.	Propeller	Klassic 170/3/R	1	5.29	-1.395	✓
3.	Airspeed indicator	BK-300	1	0.29	-0.014	
4.	Airspeed indicator	BK-15	1	0.29	-0.014	✓
5.	Airspeed indicator	LUN 1106	1	0.40	-0.014	
6.	Altimeter	BG-3E	1	0.60	-0.014	✓
7.	Altimeter	BG6-2	1	0.63	-0.014	
8.	Altimeter	UL 10-42	1	0.60	-0.014	
9.	Altimeter	LUN 1128	1	0.63	-0.014	
10.	Rate-of-climb ind.	BC-2A	1	0.36	-0.014	✓
11.	Rate-of-climb ind.	BC10-1B	1	0.36	-0.014	
12.	Rate-of-climb ind.	LUN 1144	1	0.40	-0.014	
13.	Turn and bank ind.	BZW-4B	1	0.46	-0.014	✓
14.	Turn and bank ind.	RCA 83	1	0.92	-0.014	
15.	Artificial horizon	RCA 26AK-1	1	1.30	-0.014	✓
16.	Directional gyro	RCA 15AK-1	1	1.30	-0.014	✓
17.	Magnetic compass	SIRS Navigator NV2A	1	0.27	-0.111	✓
18.	Pitot tube	WA 037383	1	0.036	-0.275	✓
19.	Engine speed ind.	D1-211-5021	1	0.20	-0.014	✓
20.	Oil press indicator	D1-211-5054	1	0.14	-0.014	
21.	Oil press indicator	D1-211-5055	1	0.14	-0.014	✓
22.	Oil temperature ind.	D1-211-5091	1	0.14	-0.014	
23.	Oil temperature ind.	D1-211-5084	1	0.14	-0.014	✓
24.	CHT indicator	D1-211-5082	1	0.14	-0.014	
25.	CHT indicator	D1-211-5085	1	0.14	-0.014	✓
26.	Fuel gauge	D1-211-5074	2	0.14	-0.014	✓
27.	Fuel press indicator	D1-211-5068	1	0.104	-0.014	
28.	Fuel press indicator	D1-211-5089	1	0.104	-0.014	✓



No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
29.	Engine hour ind.	Hobbs, series 8500	1	0.085	-0.014	✓
30.	Manifold press. ind.	UMA 7-100-20	1	0.14	-0.014	
31.	Voltmeter	D1-211-5086	1	0.20	-0.014	✓
32.	OAT termometer	D1-211-5122	1	0.136	-0.014	✓
33.	Altitude encoder	ACK A-30	1	0.23	-0.120	✓
34.	ATC antenna	AV-74	1	0.097	1.21	✓
35.	COMM antenna	AV-530	1	0.23	2.14	✓
36.	COMM antenna	AV-17	1	0.29	1.26	
37.	NAV/VOR/LOC antenna	CI 158C-2	1	0.17	4.30	✓
38.	MKR antenna	CI 118	1	0.29	2.80	
39.	Beacon/position light	LED 90340-01	1	0.24	0.437	✓
40.	Beacon/position light	LED 90340-02	1	0.24	0.437	✓
41.	Landing light	LED 71141	1	0.454	0.140	✓

Section 7 – Airplane & System Description

Not Affected.

Section 8 – Handling, Servicing & Maintenance

Not Affected.



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Supplement No. 4

Garmin GTX 328 ATC Transponder

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	29.02.2012

This Supplement must be contained in Pilot's Operating Handbook if Garmin GTX 328 ATC Transponder is installed on the airplane.

Information contained in this Supplement adds or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under initial certification approval EASA.A.592 dated 24.5.2012.



Log of Revisions

Rev. No.	Affected Pages	Description	EASA Approved / Date	Inserted / Date



Section 1 – General Information

This Supplement adds information necessary for operation of the airplane with Garmin GTX 328 ATC transponder that is installed in accordance with the approved airplane manufacturer documentation.

Section 2 – Limitations

Not Affected.

Section 3 – Emergency Procedures

Not Affected.

Section 4 – Normal Procedures

After Engine Start

AVIONICS MASTER switch **ON**
ON key on the transponder **PRESS**

Before Take-off

Mode selection key **ALT**
Selects Mode A and Mode C –the transponder replies to identification and altitude interrogations.

NOTE

If the **ON** key is pressed the transponder transmits signal Mode A – identification code only.

After Landing

Mode selection key **STBY** or **OFF**

Section 5 – Performance

Not Affected



Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	ATC transponder	Garmin GTX 328	1	1.74	-0.014	✓

Section 7 – Airplane & System Description



Figure 1 – Front panel of Garmin GTX 328

- 1...Key for activation of the Special Position Identification code
- 2... Mode selection keys
- 3...Display
- 4...Changes the page shown on the right side of the display
- 5...Cursor key
- 6...Key for canceling previous key press during code selection
- 7...Starts and stops the Altitude monitor, Count Up, Count Down and Flight timers.
- 8... Photocell



- 9...Sets the transponder code to the pre-programmed VFR code
- 10..Code selection keys

General

The system Garmin GTX 328 transponder consist of transponder unit, antenna and altitude encoder. The GTX 328 receives signals from ground radars and replies to the interrogations the identification code and flight altitude.

Mode Selection Keys

Mode selection keys (2) are located on the left next to the display. Selected mode is indicated by letters on left side of the display.

- OFF** Switches OFF the transponder. Transponder must be switched off during engine start.
- STBY** Selects the standby mode. Last active identification code will be displayed. When in STBY mode the transponder will not reply to any interrogations. This is a standard mode during airplane taxiing.
- ON** Selects Mode A. last active code is selected. In this mode the transponder replies to interrogations. Replies do not include altitude information.
- ALT** Selects Mode A and Mode C. In this mode, the transponder replies to identification and altitude interrogations. Replies to altitude interrogations include standard pressure altitude.

Code Selection Keys

Code selection is done with eight keys (10). It is possible to select any of 4,096 active identification codes. Selected and active code must comply with rules for VFR and IFR rules.

Entering the New Code

1. Press the **CLR** key and erase the current code.
2. The keys with 1 to 7 digits are intended for entering a new code. The new code is activated when the fourth digit is entered. Pressing the **CRSR** Key during code entry, removes the cursor and cancels data entry



Important Codes

NOTE

During regular operation avoid an accidental selection of the codes intended for emergency: 7500, 7600 and 7700.

- 1200 – the VFR code for any altitude in the U.S.A.
- 7000 – the VFR code commonly used in Europe (refer to ICAO standards)
- 7500 – hijack code (airplane is subject to unlawful interference)
- 7600 – loss of communications
- 7700 - emergency
- 7777 – military interceptor operations
- 0000 – military use

Reply Code

The transponder's reply to interrogations is indicated by illumination of „R“ symbol located in lower left corner of the display.

IDENT Key

Pressing the **IDENT** Key activates the Special Position Identification (SPI) Pulse for 18 seconds, identifying your transponder return from others on the air traffic controller's screen. The word 'IDENT' will appear in the upper left corner of the display while the **IDENT** mode is active.

VFR key

Sets the transponder code to the pre-programmed VFR code selected in Configuration Mode (this is set to 7000 at the factory). Pressing the **VFR** Key again restores the previous identification code.

FUNC key

Pressing the **FUNC** key changes the page shown on the right side of the display. Display data includes the following:

PRESSURE ALT - displays the altitude data supplied to the GTX 328 in feet. An arrow may be displayed to the right of the altitude, indicating that the altitude is increasing or decreasing.

FLIGHT TIME – Displays flight time.

COUNT UP TIMER – Controlled by **START/STOP** key. Pressing the **CLR** key resets the timer.



COUNT DOWN TIMER (čítač času) - Controlled by **START/STOP**, **CLR**, and **CRSR** keys. The initial Count Down time is entered with the 0 – 9 keys

CONTRAST - This page is only displayed if manual contrast mode is selected during installation configuration. Contrast is controlled by the 8 and 9 keys.

Section 8 – Handling, Servicing & Maintenance

Not Affected



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Supplement No. 7

GPS Receiver Garmin Area 500

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	29.02.2012

This Supplement must be contained in Pilot's Operating Handbook if the GPS receiver Garmin Area 500 is installed on the airplane.

Information contained in this Supplement adds or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under initial certification approval EASA.A.592 dated 24.5.2012.



Log of Revisions

Rev. No.	Affected Pages	Description	EASA Approved / Date	Inserted / Date



Section 1 – General Information

This supplement adds information which is necessary for operation of the SportStar RTC airplane with the GPS receiver Garmin Area 500 installed in the airplane.

Section 2 – Limitations

1. The Garmin Area 500 must be switched off during the engine starting.
2. Jeppesen Sanderson releases updated database every 28 days. Pilot using an out-of-date database does so entirely at their own risk.
3. The altitude calculated by the Garmin Area 500 is never used for vertical navigation.
4. Never use the Garmin Area 500 as the only navigation equipment.
5. If you use the Garmin Area 500 for navigation, the Pilot's Guide, doc. No. 190-01117-02 rev. A, published October 2009 or later valid version should be on the airplane aboard.

Section 3 – Emergency Procedures

Not affected.

Section 4 – Normal Procedures

Switching-on

AVIONICS MASTER switch **ON**

POWER push button on the GPS **PRESS**

You have to acknowledge database validity on the welcome screen.

NOTE

Detailed operating instructions are stated in the Pilot's Guide, doc. No. 190-01117-02 rev. A, published October 2009 or later valid version.



Section 5 – Performance

Not Affected.

Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	GPS receiver	Garmin GPS Area 500	1	0.29	-0.014	✓
2.	GPS antenna	GA 25	1	0.23	-0.261	✓

Section 7 – Airplane & System Description

The GPS receiver GARMIN Area 500 is installed in the airplane. Unit is located in the centre of the instrument panel. The GPS receiver is switched on/off by **POWER** push button located in the right top corner of the unit. The GPS receiver is controlled via the touch sensitive display and graphical user interface.

NOTE

Detailed operating instructions are stated in the Pilot's Guide, doc. No. 190-01117-02 rev. A, publish date October 2009 or later valid version.

Section 8 – Handling, Servicing & Maintenance

Not Affected.



Supplement No. 16

Garmin GNC 255A / 255B COM/NAV/LOC/ILS Receiver

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	15.03.2013

This Supplement must be contained in Pilot's Operating Handbook if Garmin GNC 255A / 255B COM/NAV/LOC/ILS unit is installed on the airplane.

Information contained in this Supplement adds or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under AFM approval No. 10045104 dated 30.05.2013.



Section 1 – General Information

This Supplement adds information necessary for airplane operation with Garmin GNC 255A / 255B COM/NAV/LOC/ILS receiver is installed in the SportStar RTC airplane.

Section 2 – Limitations

Not Affected.

Section 3 – Emergency Procedures

Emergency Channel

The standard emergency channel (121.5 MHz) is stored in the Com memory of the GNC 255A / 255B.

1. Press **C/N** if the unit is not in Com mode already.
2. Press and hold the **FLIP/FLOP** key for approximately two seconds.

The Emergency Channel will be inserted into the Active Frequency position and the previous Active Frequency will become the Standby Frequency.

Section 4 – Normal Procedures

Switching On

AVIONICS MASTER switch **ON**

PWR/VOL/COM knob on the left side of the unit..... rotate clockwise to turn **ON**

Intercom On/Off

The Intercom On/Off function toggles intercom on and off.

1. Press **FUNC** to access the Functions. Turn the large knob to select the ICS Function. Turn the small knob to view the Intercom On/Off function. Then, press the **ENT** key.
2. Turn the **SMALL** knob to set the Intercom On or Off. Then, press the **ENT** key to save the selected value.



Adjusting an Intercom

The Adjust Intercom function allows you to set values for the Intercom squelch and volume. The Intercom On/Off function must be set to On to make the Adjust Intercom function available.

1. Press **FUNC** key to access the Functions. Turn the large knob to select the ICS Function. Turn the small knob to view the Adjust Intercom function. Then, press the **ENT** key.
2. Turn the small knob to set the ICS Squelch value. Then, press the **ENT** key.
3. Turn the large knob to select the ICS Squelch or Volume. Turn the small knob to set the value. Then, press the **ENT** key to save the selected values.

Selecting a Com Frequency

New frequencies are first selected as a Standby frequency and then toggled to the Active side with the **FLIP/FLOP** key.

While viewing the Standby frequency display, use the **TUNE** large and small knobs on the right side of the unit to select the desired frequency.

1. Press **C/N** to reach the Com radio function. The **COM** annunciator on the top line of the display will show.
2. Turn the large (outer) knob to change the values in 1 MHz increments.
3. Turn the small (inner) knob to change the values in 25 kHz or 8.33 kHz increments.
4. Press and release the **FLIP/FLOP** key to toggle the Standby frequency to the Active frequency.

Saving a Com Channel

The current Standby frequency may be saved into the Com User Frequency database from the Com display or the Com User Function. The Com User Frequency database can hold up to 15 frequencies.

1. Press **ENT**. The Standby frequency is selected and the Waypoint name field will be active.
2. Turn the small knob to select characters.
3. Turn the large knob to move the cursor.
4. After selecting the desired characters, press **ENT**.
5. Turn the large knob to select the waypoint type.
6. Turn the small knob to select the type from the list.
7. After making a selection, press **ENT**.



COM Database Look-Up

1. Press the **CRSR** (cursor) knob from the Com display to activate the database look-up function.
2. Turn the small knob to select characters and turn the large knob to move the cursor.
3. After selecting the desired characters, press **ENT**. Turn the small knob to scroll through the list of waypoint types. Waypoint Types with a "+" sign will have more frequencies for the same type. After selection, the selected waypoint and type will be remembered for 30 minutes.
4. Press **ENT** to copy the frequency into the Standby frequency location. Press and release the **FLIP/FLOP** key to swap the Active and Standby frequencies.

Selecting a Nav Frequency

The selection of Nav frequencies is the same as for the Com frequencies.

1. Press **NAV** to reach the Nav radio function. The NAV annunciator on the top line of the display will show.
2. Turn the large (outer) knob to change the values in 1 MHz increments.
3. Turn the small (inner) knob to change the values in 50 kHz increments.
4. Press and release the **FLIP/FLOP** key to toggle the Standby frequency to the Active frequency.

Saving a Nav Channel

The current Standby frequency may be saved into the Nav User Frequency database from the Nav display or the Nav User Function. The Nav User Frequency database can hold up to 15 frequencies.

1. Press **ENT**. The Waypoint name field will be active.
2. Turn the small knob to select characters.
3. Turn the large knob to move the cursor.
4. After selecting the desired characters, press **ENT**.
5. Turn the large knob to select the waypoint type.
6. Turn the small knob to select characters.
7. Turn the large knob to move the cursor.
8. After selecting the desired characters, press **ENT**.



Listening to the Nav Audio Channel

Nav ident is enabled by pressing the **Nav Volume** knob when the Nav display is active. When Nav ident is enabled, the ID annunciation will appear to the left of the active Nav frequency.

Nav audio volume is adjusted using the **Nav Volume** knob. Turn the **Nav Volume** knob clockwise to increase volume, or counterclockwise to decrease volume.

OBS Mode

The OBS radial of the remote CDI will be decoded and displayed on the screen of the GNC 255A / 255B.

1. Press the **OBS** key to see the current OBS setting and graphic CDI.
2. Use the **LARGE** and **SMALL** knobs to change the displayed OBS values.

The GNC 255 graphic CDI is shown as a graph of five dots right or left of the triangle icon. Each dot indicates two degrees deflection with ten degrees full deflection to each side. Fly towards the bar to be on-course.

Advanced Operation

Advanced operational procedures are described in the Garmin GNC 255A/255B Pilot's Guide 190-01182-01 Rev. A or later available version..

Section 5 – Performance

Not Affected.

Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	Com/Nav/LOC/ILS Receiver	Garmin GNC 255A / 255B	1	1.37	-0.014	✓
2.	CD Indicator	GI 106A	1	1.4	-0.014	
3.	CD Indicator	GI 106B	1	1.4	-0.014	✓

**Section 7 – Airplane & System Description****General**

Combining VHF communications transceiver with 200 channel VOR, Localizer and Glideslope receivers, the GNC 255A / 255B provides a full-functioned navigation and communication solution. The GNC 255A is available with a 10 watt com transmitter, while the GNC 255B is available with a 16 watt com transmitter.

The GNC 255A / 255B has the ability to monitor the standby Com frequencies. The GNC 255's Com radio operates in the aviation voice band, from 118.000 to 136.975 MHz, in 25 kHz steps (default). For European operations, a Com radio configuration of 8.33 kHz steps is also available. The unit VHF Nav receiver operates from 108 MHz to 117.95 MHz decoding both the VHF Omni Range and Localizer navigation signals. The built-in Glideslope receiver will automatically tune the corresponding glideslope paired frequencies (328 MHz to 335 MHz) when the localizer is tuned.

Unit and control description are shown in the Figure 1.

Key Features

- High-intensity alphanumeric LED display
- 200 VOR channel channel
- 760 communication channels
- Com frequency range: 118 to 136.992 MHz with 25 / 8.33 kHz spacing
- VOR frequency range: 108 to 117.95 MHz
- Glideslope frequency range: 328.60 to 335.40 MHz
- Localizer frequency range: 108 to 111.95 MHz
- Digitally decoded OBS setting
- Active and standby Flip/Flop frequencies
- Frequency monitor function
- Voice activated intercom
- Dedicated emergency channel selector



Description

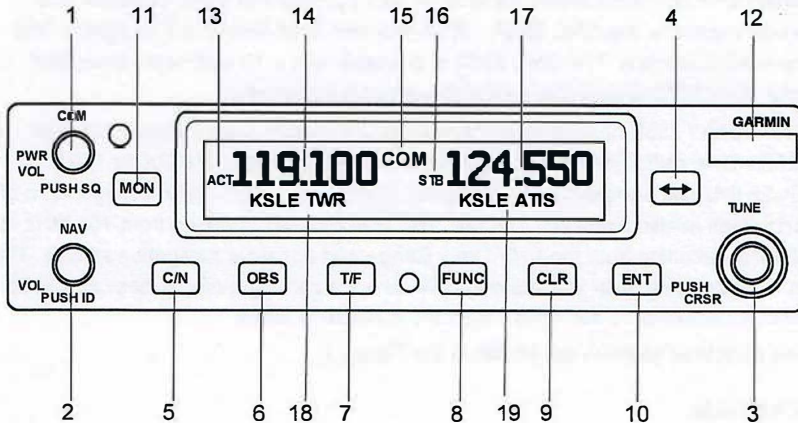


Figure 1 –Garmin GNC 255A display and control description

1. Power On/Off – Com Volume – Squelch On/Off

The knob located on the top left corner of the GNC 255A. Rotate knob clockwise (CW) past the detent to turn the power on. Continuing to rotate the knob to the right increases speaker and headphone amplifier volume level. When the Com radio is active, press the knob to toggle automatic squelch control On/Off for the Com radio.

2. Nav Volume/ID Knob

The **Nav Volume/ID** knob located in the bottom left corner of the bezel controls audio volume for the Nav radio. Press the **Nav Volume/ID** knob and the Morse code tones will be heard. When Morse code tone is active, "ID" will appear to the left of the Nav active frequency.

3. Large/Small knobs

The dual concentric knobs located on the right side of the GNC 255A / 255B are used to select frequencies, to enter data, to view the features available within a function, or make changes. Details are provided in the GNC 255A / 255B Pilot's guide.

4. FLIP/FLOP button

Press and release the **FLIP/FLOP** button to switch between the active (left-most) and standby (right-most) frequency. Switching between Com frequencies is disabled while you are transmitting.

**5. C/N (Com/Nav Key)**

Press **C/N** key to select the Com or Nav mode. The annunciator will light above the button when you are in Com mode.

6. OBS

Press the **OBS** key to see the current OBS setting and graphic CDI. The OBS page will be disabled if the unit is installed with an external converter.

7. T/F

Press **T/F** to toggle between the bearing TO or radial FROM the active VOR. The T/F button does not operate for Localizer frequencies.

8. FUNC (Function) Key

The **FUNC** (Function) key accesses function categories for the following: the Com Radio, Nav Radio, ICS Configuration, System Configuration, and Timer. Pressing the **FUNC** key once displays the Function mode. Pressing the **FUNC** key a second time exits the Function mode.

9. CLR (Clear) Key

Pressing the **CLR** key erases information, cancels entries, and resets timers.

10. ENT (Enter) Key

Press **ENT** to save selected values, to confirm a prompt, or save the Standby frequency.

11. MON (Monitor) Key

The **MON** (Monitor) key will engage the monitor function where the Standby frequency may be monitored while still listening to the Active frequency.

12. USB Port

The USB port is used to update the frequency database in the GNC 255.

13. ACT Symbol

The **ACT** symbol indicates active Com or Nav frequency displayed on right next to **ACT** symbol.

14. Active frequency window**15. COM / NAV Symbol**

The **COM / NAV** symbol indicates active Com or Nav mode.

16. STB Symbol

The **STB** symbol indicates standby Com or Nav frequency displayed on right next to **STB** symbol.

17. Standby frequency window**18. and 19. Waypoint name and frequency type symbols**



Instrument Panel

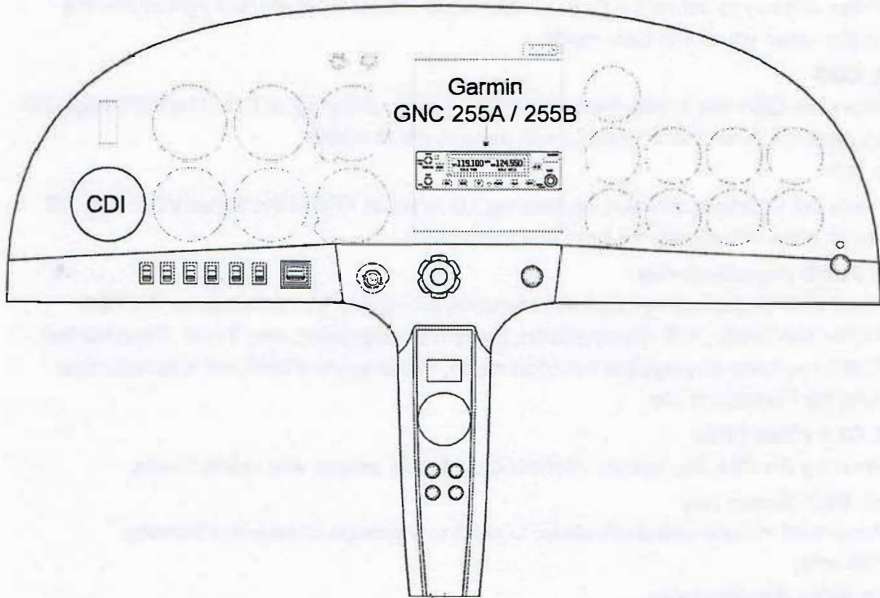


Figure 2 – Instrument panel with GNC 255A / 255B COM/VOR/LOC/ILS receiver and CDI installed

Section 8 – Handling, Servicing & Maintenance

Not Affected.

- THE END -



Supplement No. 19

External power source socket installation E7 68-91 01

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	17.03.2014

This Supplement must be contained in Pilot's Operating Handbook if the airplane is equipped with external power source socket E7 68-91 01.

Information contained in this Supplement adds or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under the AFM Approval No. 10050157 dated 2014-08-07.



Log of Revisions

Rev. No.	Affected Pages	Description	EASA Approved / Date	Inserted / Date



Section 1 – General Information

This supplement adds information which is necessary for operation of the SportStar RTC airplane with the following equipment installed in the airplane:

- External power source socket E7 68-91 01

For other equipment not mentioned in this supplement see basic POH and other supplements to POH.

Section 2 – Limitations

External Power Source Socket

Electrical power from external power source can be use only for engine starting. It is not intended and designed as a ground electrical source for powering airplane instruments.

Section 3 – Emergency Procedures

Not Affected.

Section 4 – Normal Procedures

Pre-flight Check

1. Check the condition of external power source socket.

Before Engine Starting

1. Connect the external power source to the aircraft.
2. The blue **EXT. POWER** annunciator must light up on the top left side of the instrument panel.

Engine Starting

At the end of the procedure:

1. Disconnect the external power source from the aircraft.
2. The blue **EXT. POWER** annunciator must go out on the top left side of the instrument panel.

Section 9

Supplement No. 19

Ext. power socket

**PILOT'S OPERATING HANDBOOK**

Doc. No. ERTC020-10-AS-019

**Section 5 – Performance**

Not Affected.

Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	Power source socket	Piper type	1	0.280	-490	✓

Section 7 – Airplane & System Description**External Power Source Socket**

There is installed an external power source socket (Piper type) in the airplane, located in front of fire wall on the right hand side of the fuselage. External power source is intended only for engine starting. When the external power source is connected to the airplane than **EXT. POWER** blue annunciator lights up. Recommended power source output is 12V/200A.

Section 8 – Handling, Servicing & Maintenance

Not Affected.



Supplement No. 25

Emergency Locator Transmitter KANNAD AF INTEGRA

Airplane Serial Number:	2016 1919
Airplane Registration Number:	F-HATF
Date of Issue:	22.04.2016

This Supplement must be contained in Pilot's Operating Handbook if the ELT KANNAD AF INTEGRA is installed on the airplane.

Information contained in this Supplement adds or supersedes information from basic Pilot's Operating Handbook in the further mentioned parts only. Limitation, procedures and information not included in this supplement are contained in the basic Pilot's Operating Handbook approved by EASA.

This Pilot's Operating Handbook Supplement is EASA approved under the AFM Approval 10058028 dated 09.05.2016.



Log of Revisions

Rev. No.	Affected Pages	Description	EASA Approved / Date	Inserted / Date



Section 1 – General Information

This Supplement adds information necessary for operation of the airplane with ELT KANNAD AF INTEGRA that is installed in accordance with the approved airplane manufacturer documentation.

Section 2 – Limitations

Not Affected.

Section 3 – Emergency Procedures

After Emergency Landing

NOTE

Carry out the following procedure in case of necessity.

1. Check if the emergency locator transmitter was switched on – red light on the remote control panel flashing periodically during 121.5 MHZ transmission or long flash during 406 MHZ transmission, buzzer is buzzing (1 beep per 0.7 second during 121.5 MHZ transmission and silence during 406 MHZ transmission) and radio station is receiving an audio signal on frequency of 121.5 MHz.
2. If the ELT was not switched on automatically – set the switch on the remote control panel or on ELT to **ON** position.
3. If the main antenna was damaged or if there is a danger of ELT damage, then:
 - Remove the ELT from the airplane and place it in a safe distance from the airplane.
 - Set the **ARM-OFF-ON** switch to **ON** position



Section 4 – Normal Procedures

Before Take-off

1. **ARM-OFF-ON** switch on ELT **ARM**
2. Switch on the remote control panel **ARMED**

After Landing

1. **ARM-OFF-ON** switch on ELT **ARM**
2. Switch on the remote control panel **ARMED**

For long term parking:

3. **ARM-OFF-ON** switch on ELT **OFF**

ELT Functional Check (121.5 MHz frequency only)

NOTE

ELT check on 121.5 MHz frequency must be carried out at least once a month.

Carry out the check during the first 5 minutes of every hour and not longer than 5 seconds. Inform the ATC about the check.

1. Set the active frequency of 121.5 MHz on the board radio station.
2. **ARM-OFF-ON** switch on ELT **ARM**
3. Switch on the remote control panel **RESET/TEST**
4. Listen for the buzzer-it operates during the whole Self-test procedure. Close to the end of self-test a short (3 sweeps) 121.5 transmission is made - confirm this on the aircraft radio.
5. After a few seconds, the test result is displayed with the red visual indicator and the buzzer will sound:
 - One long flash indicates that the system is operational and no error conditions were found.
 - A series of short flashes indicates the test has failed. The number of short flashes gives an indication of the faulty parameter detected during the self-test – see Section 7 for details.



Section 5 – Performance

Not Affected.

Section 6 – Weight & Balance

No.	Title	Type	No. of items	Weight [kg]	Arm [m]	Installed
1.	Emergency locator transmitter	KANNAD AF INTEGRA	1	0.75	1.700	✓
2.	Remote control	RC200	1	0.03	-0.014	✓
3.	Antenna	AV-200	1	0.085	3.150	✓

Section 7 – Airplane & System Description

Description

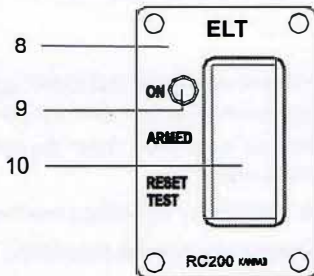
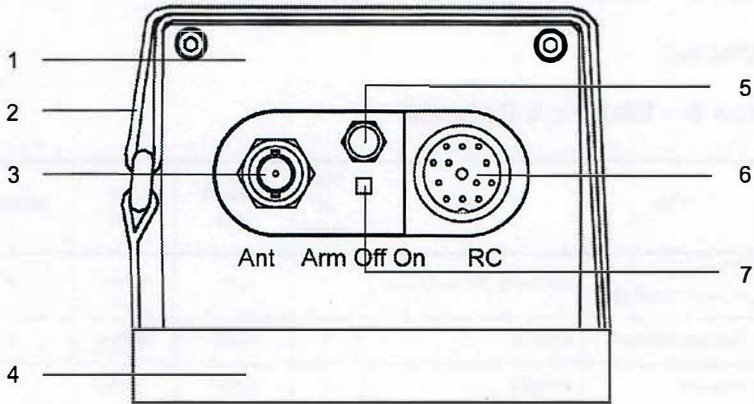
The emergency location radio transmitter KANNAD AF INTEGRA consists of the unit which is installed in the baggage compartment and the control panel which is installed in the instrument panel. The external antenna is installed under the composite upper part of the fuselage aft of the baggage compartment.

The KANNAD AF INTEGRA transmits emergency signals on two frequencies:

- 406 MHz (Cospas-Sarsat frequency) for precise pinpointing and identification of the aircraft,
- 121.5 MHz used for homing in the final stages of the rescue operations.

The unit has the built-in GPS receiver and therefore the aircraft position (accuracy typically about 60 meters) will be transmitted by the ELT within minutes following the distress.

The energy to the units is provided by a battery pack composed of a LiMnO₂ two-element battery. Until the battery expiry date, the duration of the 121.5 MHz transmission is over 48 hours at -20°C. As it is therefore preferable to keep the battery power for 121.5 MHz homing frequency transmission for the rescue operations, in compliance with Cospas-Sarsat specifications, the 406 MHz transmission is deliberately stopped after 24 hours to extend the 121.5 MHz transmission for as long as possible.



- | | | | |
|---|--|----|--|
| 1 | ELT unit | 6 | Socket connection to remote control panel |
| 2 | Attaching strap | 7 | Red visual indicator |
| 3 | BNC connector for the external antenna | 8 | Remote control panel |
| 4 | Bracket | 9 | Red visual indicator |
| 5 | 3-position switch ARM-OFF-ON | 10 | 3-position switch ON-ARMED-RESET/TEST |

Fig. 1 – ELT unit and Remote Control panel



Operation

The ELT operates automatically if the switch on the unit in **ARM** position. The ELT is activated by switch which reads aircraft acceleration in longitudinal direction. When the value of 3.5 ft/sec of airplane longitudinal acceleration is exceeded, the ELT unit is automatically activated and starts continuously transmitting emergency radio signal at frequency of 121.5 MHz. Every 50 seconds the units transmits a 406 MHz signal.

Manual activation of the ELT is possible either by setting the switch on the remote control unit to **ON** position or by setting the switch on the unit to **ON** position.

The activated ELT can be switched off by setting the switch on the remote control unit to **RESET** position panel or by setting the switch on the unit to **OFF** position.

The ELT has 4 different modes of operation:

- Off
- Self-test (temporary mode)
- Armed (standby mode to enable automatic activation by the shock sensor or by an optional remote control panel).
- On (transmission).

Off Mode

The ELT is off when the switch is in the **OFF** position, no part of the ELT is energized. This mode must **only** be selected when the ELT is removed from the aircraft or when the aircraft is parked for a long period or for maintenance.

Self-Test Mode

The self-test mode is a temporary mode (max duration 15 seconds) in which the ELT checks the main characteristics of the transmitter (Battery voltage, Programming...) and enables digital communication with programming and test equipment. This mode is selected:

- When switching from **OFF** to **ARM** on ELT;
- When switching to **RESET/TEST** on the remote control panel (provided that the switch of the ELT is in the **ARM** position);
- When switching to **ON** prior to transmission.

The buzzer operates during the self-test procedure

After about 10 seconds, the test result is displayed on the red visual indicator as follows:

One long flash, duration 1 s, indicates a proper functioning.

A series of short flashes, 200 ms, indicates a faulty functioning.



The number of flashes indicates the type of failure:

3+1	LOW BATTERY VOLTAGE
3+2	LOW RF POWER
3+3	FAULTY VCO LOCKING (FAULTY FREQUENCY)
3+4	NO IDENTIFICATION PROGRAMMED
3+5	FAULTY VSWR (LINK TO EXTERNAL ANTENNA)
3 + 6	INTERNAL GPS SERIAL LINK

Armed Mode

In order to enable activation by the G-Switch or with the remote control panel, the ELT must be in standby mode with the switch in the **ARM** position. **This mode is mandatory during flight.** The ELT should remain in the "ARM" position except when the aircraft is parked for a long period or for maintenance.

On Mode

This mode is selected:

- Manually by switching the ELT to **ON**;
- By switching the remote control panel switch to **ON** (provided that the ELT switch is in the **ARM** position);
- Automatically when a crash occurs (provided that the ELT switch is in the **ARM** position).

When the ON Mode selected, the ELT starts transmitting:

- After 50 seconds on 406 MHz (one 406 MHz burst every 50 sec.) to the external antenna;
- After the GPS lock on 121.5 MHz (continuous transmission between each 406 MHz burst). If GPS lock does not occur within 5 minutes, the 121.5 MHz will be activated.
- The red visual indicator on the ELT and on the remote control panel flashes and the buzzer operates:
 - Red visual indicator:
 - 1short flash during ELT transmission on 121.5 MHz (every 0.7 seconds);
 - 1long flash during ELT transmission on 406 MHz (every50 seconds).
 - Buzzer:
 - 1.5 Hz pulse signal (recurrence 0.7s) during ELT transmission on 121.5 MHz



In case of accidental activation, the ELT can be reset either by switching it to **OFF** or by switching to **RESET** on the remote control panel.

The number of 406 MHz bursts transmitted is recorded. This information is available when the ELT is connected to a programming and test equipment (PR600).

Section 8 – Handling, Servicing & Maintenance

Battery - KIT BAT200

The internal battery must be replaced according to expiry date written on the battery pack and on the ELT label.



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