Flight Design AIRCRAFT OPERATING INSTRUCTIONS CTSW

(CTSW / CTSW-2006 / CTSW Classic / CTSW Advanced)



SERIAL NUMBER:

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Note: In accordance FAR 21.190 Flight Design has established Aircraft Operating Instructions for the CTSW. The content and format is defined by ASTM standard F2245 and supplemented as deemed necessary by the manufacturer.

2 General Information

Read this before your first flight!

Each pilot must be familiar with the contents of the Aircraft Operating Instructions Manual and abide by all placards, limitations and checklists. Additionally, all Service Directives must be complied with and the Maintenance and Inspections Procedures manual must be used for all maintenance. For maintenance of the Rotax® engine, the BRS emergency parachute system and other installed equipment refer to the original manufacturers' manuals.

Flight Design CTSWs are delivered worldwide, and comply with a variety of Light Sport airworthiness standards. All configurations are equipped with non-certified engines that meet ASTM standard F2339. Unless otherwise specified, the information given is common to all configurations. Where different, the information is given in the appropriate appendices and supplements.

The Flight Design CTSWs delivered in the U.S.A. are built to conform to the U.S. Light Sport Pilot rules and are intended for Day/VFR use.

This manual is for guidance when operating a CTSW aircraft and is not intended to substitute for any required training received from an appropriately rated flight instructor.

Manufacturer

Flight Design GmbH Sielminger Str. 65 D – 70771 L.-Echterdingen

Basic description

The CTSW is a conventional two seat high-wing aircraft with three-axis controls.

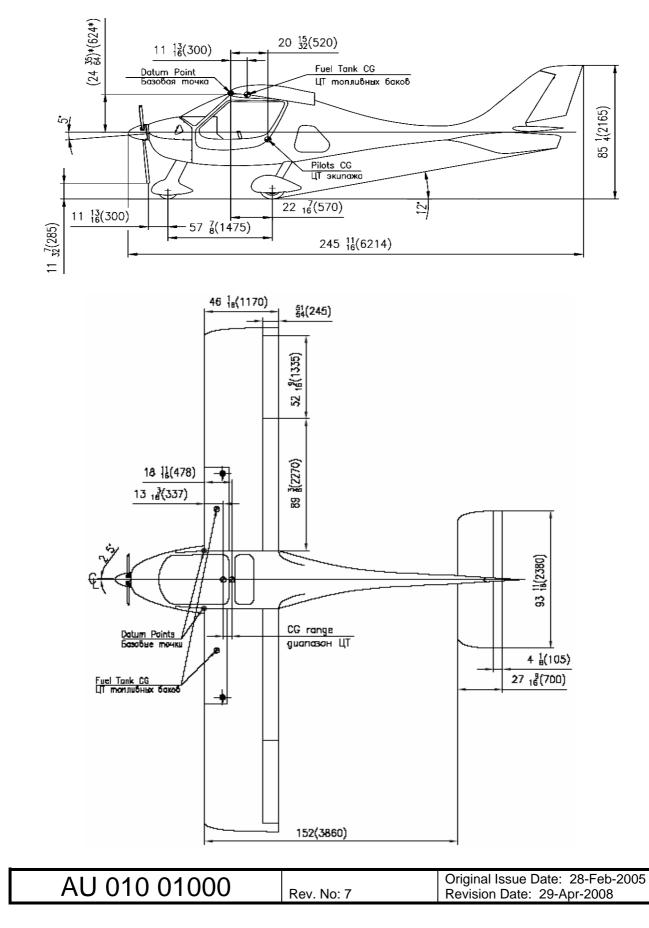
The wings are fully cantilevered, incorporate integral fuel tanks, pushrod actuated ailerons and slotted type flaps that extend downwards for slow speed flight, and reflex upwards for cruise flight.

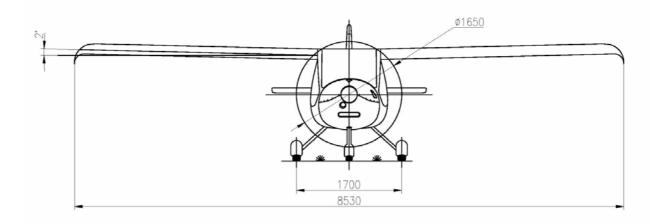
The aircraft is equipped with an all-moving stabilator with a trim tab and tricycle landing gear with a steerable nose-wheel.

The primary structures are made of carbon fiber reinforced plastic.

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Views and dimensions, inches (mm)





Geometrical parameters

Geometry, mm / inch		
Max. length	6214	244.6
Max. height	2165	85.3
Areas, m ² / ft ²		
Wing	9.98	107.4
Stabilator	1.65	17.75
Vertical tail	1.32	14.20
Wing span, m / inch	8.53	335.8
Aspect ratios		
Wing	7,29	
Stabilator	3,4	10

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3 Airplane and Systems Descriptions

3.1 Engine: Rotax® 912 Series

Description

The standard engine is a Rotax 912 UL2, a four cylinder, horizontally opposed, normally aspirated four stroke engine that incorporates air cooled cylinders with liquid cooled heads.

Limitations

	ROTAX 912 UL2	ROTAX 912 ULS
Take-off performance: (at 5.800 RPM, max 5 min)	59.6 KW / 81 HP	73.5 KW / 100 HP
Max. continuous performance (at 5.500 RPM)	58 KW / 79 HP	69 KW / 95 HP
Min RPM before take-off, RPM	4.400	4.500
Max RPM before take-off, RPM	5.500	
Max cylinder head temperature	120 °C	
	248	3 F

For a complete description of the engine and limitations see the Rotax 912 Operator's Manual

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3.2 Propeller

For a complete description of the propeller see Operator's Manual for appropriate propeller

Applicability

	CTSW Classic Light	CTSW Classic	CTSW Advanced
Neuform TXR-65, 2-blade	•		
Neuform CR3-65, 3-blade		•	•
Kaspar, 3-blade in-flight adjustable		•*	•*

* - available as an option

3.3 Fuel and fuel capacity

The fuel valve is purely on/off and has to be in the appropriate maximum position. This engine does not have a mixture valve or require leaning.

- Fuel specification: Premium Automotive Unleaded per ASTM D 4814, minimum AKI 91 for Rotax 912ULS. SUPER leaded, DIN 51600, ONORM C 1103 EURO-SUPER ROZ 95 unleaded, DIN 51603, ONORM 1101 SUPER PLUS ROZ 98 unleaded, DIN 51607, ONORM 1100 AVGAS 100 LL.
 - **ATTENTION!** AVGAS loads the valve seats with high lead content and forms more combustion chamber deposits and should be used only in case of vapor lock or insufficient octane on auto fuel.

Each wing has an integral fuel tank with a capacity of 65I / 17 U.S. gallons of which 62I / 16.5 gallons are usable.

The total fuel capacity is 130I / 34 U.S. gallons of which 124I / 33 gallons are usable.

For complete fuel specifications see the Rotax 912 Operator's Manual

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3.4 Oil

Only brand-name semi-synthetic or full synthetic 4-stroke motorcycle oil should be used.

	ROTAX 912 UL2	ROTAX 912 ULS
Oil, normal operating pressure (below 3.500 RPM)	2.0 – 5.	
	29 – 73	3 psi
Oil, min operating pressure (above 3.500 RPM)	0.8 b	ar
	12 psi	
	on very cold start mome	entarily 7 bar allowed
Min/max temperature measured at the oil inlet of	50 / 13	O°C
the engine	120 / 20	66 °F
Optimum operating temperature	90-110	O₀ (
	190-23	0 °F
Oil capacity	3.0 l, mir	n 2.0 l
	6.4 liq pt, mir	n 4.2 liq pt
Max oil consumption, L per hour / liq pt per hour	0.06 / 0.13	

The engine is equipped with a friction clutch to guard against sudden propeller stoppage: for this reason, oils with friction modifiers or additives that favor clutch slippage should not be used.

Diesel engine oils are unsuitable because of their lower temperature tolerances.

For oil change intervals see the Maintenance and Inspection Procedures Manual.

Note: If the engine is primarily run on AVGAS, more frequent oil changes will be required because of possible lead build-up.

For complete oil specifications see the Rotax 912 Operator's Manual

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3.5 Operating weights and loading (occupants, baggage, fuel, ballast)

Operating weights

	LSA registration			
	USA Australia			alia
	kg	lbs	kg	lbs
Max. take-off weight	600	1323	544 / 600	1199 / 1323
Empty plane	314*	693*	303	668
Typical payload	297	654	241 / 297	531 / 654

* - with BRS 1350 HS

	BFU / LTF-UL registration		
	kg	lbs	
Max. take-off weight	472.5	1042	
Empty plane	268	590	
Typical payload	180 / 114.5*	396 / 252*	

* - with full tanks

	BCAR Section S registration		
	kg Ibs		
Max. take-off weight	450	922	
Empty plane	265	584	
Typical payload	185	407	

Loading

	LSA registration	BFU / LTF-UL registration	BCAR(S) registration
Maximum weight per seat	118 kg	100 kg	100 kg
	260 lbs	220 lbs	220 lbs
Maximum baggage weight per side		25 kg	
	55 lbs		
Minimum single pilot weight	54 kg	70 kg	55 kg
	120 lbs	155 lbs	122 lbs
Maximum fuel weight	93 kg		
	205 lbs		
Minimum fuel weight	9 kg	8 kg	13 kg
	20 lbs	18 lbs	29 lbs

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3.6 Structures and Systems Description

Fuselage

The fuselage of the CTSW is made of multiple layers of carbon fiber and aramid (Kevlar®) laminated over a dense foam core creating a sandwich structure. The cabin can resist loads from all sides. This provides superior pilot and passenger crash protection and low structural weight.

Wings

The cantilevered wing of the CTSW plugs into 4 hard points at the top of the cabin for attachment to the fuselage. The overlapping spars resist lift loads. The main spar caps are solid carbon fiber wrapped with S glass fibers over a dense Rohacell core. The wing "skin" is a carbon fiber sandwich. The ribs are molded carbon fiber and bonded into place.

Wingtips

The wingtips of the CTSW are highly developed drooped type. They reduce stall speed, improve stability and low speed control of the CTSW.

Fuel system

Fuel is gravity fed to the engine from two integral wing tanks. The total capacity is 130l / 34 U.S. gallons. The usable fuel quantity is 124l / 33 U.S. gallons.

The operation of the fuel valve does not allow the ignition key to be inserted unless the fuel valve is in the "ON" position.

Electric system

The Rotax 912 series of engines are equipped with a "Lighting Coil" type alternator and a rectifier-regulator that converts and regulates the output of the alternator to a nominal 13.5V – 14.2V 250W (roughly 18A).

The battery for the electric starting system is 12V sealed, AGM type.

The dual ignition system is a CDI (capacitive discharge).

Landing gear

The landing gear of the CTSW is of the tricycle type. The nose wheel is steerable through a direct link to the rudder pedals. The main gear legs are heavy duty machined aluminum rods.

Brakes

Hydraulic disk type, actuated through a handbrake lever. Parking brake is set by simultaneous use of the brake lever and parking brake valve.

Control surfaces

The movable surfaces of the CTSW are of aramid-foam-aramid, carbon-foam-aramid, carbon-foam-carbon sandwiches with carbon fiber spars and attachment points.

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Rudder

The rudder is of a conventional type and it is aerodynamically balanced and is operated through foot pedals and cables.

Stabilator

The stabilator is an all-moving type stabilizer with a counter-weight and anti servo/trim tab. It is actuated through a flexible push pull cable connected to the dual control sticks.

Ailerons

The Frise type ailerons are controlled with push pull tubes and rod bearings and droop automatically with selection of the flaps.

Flaps

The flaps are of the slotted type, and a pre-selector switch is used to position the flaps from -6° (or -12° for CT-LSA Australia) to +40°. The position of the flaps is indicated on the control panel. The flaps are protected by limit switches at the end limits.

Pitch Trim

Pitch trim is activated through a control wheel located adjacent to throttle quadrant, and acts upon trim tab on the stabilator.

Aileron Trim

Aileron trim is activated trough a control wheel located on the console between the pilot seats.

Rudder Trim System

Rudder trim is activated through a control wheel located on the cabin bulkhead above the console and between the pilot seats.

BRS Parachute system

Rocket deployed emergency parachute system. The system is actuated through the red "T" handle located on the cabin bulkhead between the pilot seats. The T handle is secured on the ground with a tagged safety pin. The pin is removed for flight operations. To deploy the parachute, the T handle is pulled out fully to the stop.

Autopilot

Autopilot is an optional equipment. The available autopilots are Digiflight II Series.

- CT Pilot 1 Axis, Digiflight II FP basis (Aileron, later upgrade possible);
- CT Pilot 2 Axis, Digiflight II FP basis (Aileron & Stabilizer, later upgrade possible);
- CT Pilot 2 Axis + vertical speed, Digiflight II FP VS basis (Aileron & Stabilizer with vertical steering).

For a complete description and operating information of the autopilot see Operating Handbook for Digiflight II Series autopilots, TruTrak Flight Systems.

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CTSW Classic Light Standard Instrument Panel*



Symbolic notations

- 1 Ignition lock / start
- 2 Fuel valve
- 3 12V outlet
- 4 Switch panel
- 5 Flap position indicator
- 6 Flap circuit breaker
- 7 Flap switch
- 8 Main circuit breaker 30A
- 9 Main circuit breaker 25A
- 10 Air speed indicator
- 11 Three pointer altimeter
- 12 Circuit breakers
- 13 Slip & bank indicator
- 14 Cabin heating
- 15 Carburettor heating
- 16 Cockpit light
- 17 Instrument light

* - instrument panels can be chosen from the list (please see Appendix 2) with accordance to the list of the instruments from the Customer Order

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Control Quadrant



Flap position indicator



Ignition switch and starter

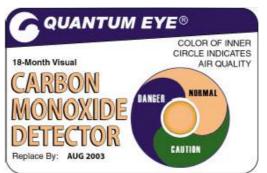


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3.7 Carbon monoxide detector

Every CTSW aircraft (starting S/N: 07-11-21) is equipped with Carbon Monoxide (CO) Detector.

The owner (pilot) is responsible to watch the date on the detector and when necessary – replace it. The owner (pilot) is also responsible to mark the date when install the new one.



Condition – Color: Normal – Yellow, Caution – Green, Danger – Dark Blue.

The Quantum Eye is a multi-level Carbon Monoxide Detector. It provides a visual indication of carbon monoxide contamination. Each detector is packaged in a protective bag that when opened activates it. Once activated the minimum product lifetime is 18 months.

Adhesive backing allows it to be easily mounted in the cockpit or any clearly visible surface.



Operating temperature range is from 41° to 100 ° F (5° C to 38° C), relative humidity (RH) range from 25 to 90% RH.

Sensor Regeneration: from caution – 2 hours, from danger – 6 hours.

Note: This information is for examination only. For details please refer to the manufacturer website www.QGinc.com.

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4 **Operating Limitations**

4.1 Stalling speeds at maximum takeoff weight (*V*_{s1} and *V*_{s0})

V_{s0}: Stalling speed or the minimum steady flight speed in the landing configuration.
 V_{s1}: Stalling speed or the minimum steady flight speed obtained in a specific configuration.

Vs	Flaps	-6° (-12°)	44 KCAS (49 KCAS)	81 km/h CAS (90 km/h CAS)
Vs1	Flaps	0°	42 KCAS	77 km/h CAS
Vso	Flaps	40°	39 KCAS	72 km/h CAS

4.2 Flap extended speed range (V_{so} to V_{FE})

The White arc on the airspeed indicator is from V_{S0} to V_{FE}, flaps 15°. **V**_{FE}: Maximum flap extended speed.

Vfe:	Flaps	0°	100 KCAS	185 km/h CAS
	-	15°	80 KCAS	148 km/h CAS
		30°	62 KCAS	115 km/h CAS
		40°	62 KCAS	115 km/h CAS

4.3 Maximum maneuvering speed (V_A)

 V_A : Design maneuvering speed (above this speed only 1/3 of max. deflection may be given, full or abrupt deflection of the control surfaces may cause structural failure).

			SA tration			LTF-UL tration		ection S tration
	US	SA	Aust	tralia				
	km/h	kts	km/h	kts	km/h	kts	km/h	kts
V _A , CAS	182	98	193	104	193	104	164	89

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Never exceed speed (V_{NE}) 4.4

VNE: Never-exceed speed.

	LSA registration			
	USA		Australia	
	km/h	kts	km/h	kts
V _{NE} , CAS	268 ²	145 ²	301 ¹ /296 ²	163 ¹ /159 ²

		/ LTF-UL stration
	km/h	kts
V _{NE} , CAS	276 ³	150 ³

	BCAR Section S registration		
	km/h	kts	
V _{NE} , CAS	280	151	

1 - Without rescue system;

2 - With BRS 1350 HS.

3 - With BRS 1050.

4.5 **Crosswind and wind limitations**

The maximum demonstrated crosswind is 30 km/h / 16 knots.

Due to the light operating weights and low minimum flight speeds of CAUTION! Light Sport Aircraft, operations with surface winds in excess of 46 km/h / 25 kts should not be attempted.

4.6 **Service Ceiling**

The Service Ceiling is the maximum altitude at which a climb rate of 100 ft/min / 30 m/min can be achieved. For the CTSW it is 4,250 m / 14,000 feet.

Note: An aircraft must be properly equipped and the pilot appropriately certificated for operations above 10,000 feet / 3,000 m.

Load factors 4.7

The maximum maneuvering limit load factor is:	+ 4 g / -2 g	Flaps up	
	~ / ~		

+ 2 g / -0 g	Flaps down
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4.8 Maneuvers

Aerobatics, including intentional spins are prohibited.

4.9 Other limitations

Flight in to known icing is prohibited.

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5 Weight and Balance Information

5.1 Installed equipment list

Please see the Appendix 1.

5.2 Center of gravity (CG) range and determination

Method for determining the Basic Empty Weight

Place the aircraft level on three suitable scales. (If only one scale is available, use leveling blocks and make separate measurements at each gear location).

The aircraft leveling reference is the top of the console (tunnel) that runs between the pilot seats.

Note the following measurements:

- G1: The weight found at the nose wheel location
- G2: The combined weight found at the main wheel locations.
- a: 35.63 in. / 905 mm the distance from the leading edge of the wing to the nose wheel.
- b: 58.07 in. / 1475 mm the distance from the main gear location to the nose wheel location.

The Basic empty weight is the total of weights found at G1 and G2

$$G1 + G2 = G$$

Using the following formula, find the Empty Center of Gravity location of the aircraft.

$$((G2 x b): G) - a = X$$

X - The distance from the leading edge of the wing to the Cg location

Using the weights found on the scales and the weight and balance sheet determine the Basic Empty Weight.

Complete the Weight & Balance and Equipment List.

Determining the Weight and Balance

Using examples (see Appendix 3), find the loaded center of gravity location. Using the center of gravity envelope, plot the loaded center of gravity.

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6 Performance

The performance figures are based on sea level, standard atmospheric conditions and a gross weight that depends on your local certification rules.

6.1 Takeoff distance

	600 kg	472,5 kg
Take-off distance over a 15 m / 50ft obstacle	232 m / 760 ft	186 m / 610 ft

6.2 Best rate of climb

At weight 600 kg and flaps 0°: $V_{Y} = 154 \text{ km/h} / 78 \text{kts}$

6.3 Best angle of climb

At weight 600 kg and flaps 0°:

6.4 Cruise speed

Propeller type: Propeller blade incidence at 3/4*r: Neuform, 2 blade, 1650 mm dia. 27 deg

 $V_x = 122 \text{ km/h} / 66 \text{ kts}$

Cruise speed at 75% power		
600 kg	-6° (-12°)	205 km/h / 112 kts
472,5 kg	-12°	205 km/h / 112 kts

6.5 RPM

Minimum Idle:	1400
Static:	4700
Normal climb:	4800
Maximum:	5800 (5 min)
Max. continuous:	5500
Normal cruise:	4200 – 5200
Cruise @ 75%:	5200

6.6 Fuel consumption

Fuel consumption in I/h / U.S. gal/h	Rotax 912 UL2	Rotax 912 ULS
at take-off performance	24,0 / 6,3	27,0 / 7,1
at max. continuous performance	22,6 / 5,6	25,0 / 6,6
at 75% continuous performance	16,2 / 4,3	18,5 / 4,9

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7 Emergency Procedures

Engine failure

The first action in case of engine failure is to lower the nose and to establish best glide speed: 115 km/h / 63 kts. If the failure occurs during takeoff, it is often best to attempt a landing straight ahead and under control rather than try to turn and return to the runway. The next action should be to identify a field for landing, taking in to consideration obstacles, field length, and wind direction.

Maintain a minimum speed of 115 km/h / 63 kts at 15° flaps until final approach. Before touchdown, select flaps 40°.

If there is sufficient time and the failure can be identified, an engine restart while in safe flight altitude may be attempted.

If the restart is successful it may be possible to proceed to a suitable landing area and perform a precautionary landing.

In case of fire shut off the engine:

- Shut off the fuel valve;
- Turn off the ignition;
- Slip away from the fire if possible;
- Land as soon as possible.

The Emergency Parachute System (BRS)

The BRS system may be used at a variety of altitudes and airspeeds. Situations that might warrant its use may include:

- A loss of control in Instrument Meteorological Conditions
- A structural failure
- A collision in flight
- An irrecoverable spin
- Pilot incapacitation
- Jammed flight controls
- Engine failure over hostile terrain

If possible, before activating the BRS shut off the engine and tighten the seatbelts. To activate the system, pull the T handle all the way to the stop.

CAUTION! The operator of a CTSW must be thoroughly familiar with the contents of the BRS Manual and abide by all instructions and limitations within.

Overturn on land

- Carefully unfasten the seat belts and lower yourself first, then your passenger.
- Be careful of any spilled fuel there may be a fire hazard!
- Leave the airplane immediately.

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Failure of the Dynon EMS

Failure of the Dynon EMS (if equipped) does not directly endanger continuation of flight. With a completely failed EMS system the engine data can no more be surveyed by the pilot. To avoid damages to the engine the flight can be continued, but operation should be limited to moderate RPMs (equalling maximum 185 km/h / 100 kts cruise speed at flaps fully negative). Aerotow or banner tow shall not be done with this failure. Ongoing flights to a qualified service station are allowed with the limitations named before. Before such a flight due care has to be given to oil and coolant quantity checks before the flight.

Flap control failure

If failure of the flap control occurred, proceed a suitable landing area and perform a precautionary landing. Use instruction for the flap manual operation.

Instruction for the flap manual operation

1) To activate the manual operation of the flap control printed circuit board (PCB), do as follows.

a) Turn the flap control switch by 180° with reference to 15° position to illuminate the LED display VD1 and central segments of the automatic operation indicator (provided the processor is in proper working condition).

This is to notify that the manual operation is switched on and the automatic operation is switched off. The control system is in the stand-by mode.





VD1

b) When the flap control switch is turned by 180° with reference to 30° position, the flaps start to retract (flaps move up)

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VD2

Located on the plate of the electric mechanism MT-10 is the limit switch which has the function to limit the movement of flaps. This corresponds to the maximum up deflection. When the flaps move, the LED display VD2 illuminates.

c) When the movement of flaps has been accomplished, the control switch should be reset to a neutral position (see item 1, a).

d) When the flap control switch is turned by 180° with reference to 0° position, the flaps start to extend (flaps move down).

At this point, the LED display VD3 illuminates. The limit switch located on the MT-10 has the function to limit the movement of flaps.



VD3

e) Intermediate flap position (for instance 0°, 15°, 30°) is to be selected by sight according to the position of flaps with respect to the wing.

To set the flaps in intermediate positions, if necessary, ensure that flaps move up or down as far as the required position. After that, stop the movement of flaps by setting the flap control switch in a neutral position (item 1, a).

2) To activate the automatic operation, set the switch in one of the designated positions (-6° (-12°), 0°, 15°, 30°, 40°), accompanied by an indication at the display corresponding to the selected position. The movement of flaps in these positions is to be stopped automatically.

To change the settings of the automatic operation, if necessary, comply with the instructions "Setting-up of flap positions".

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8 Normal Procedures

8.1 Preflight

A. Cabin

- 1. Aircraft documents Check 2. Flight controls Free and correct 3. Spar Bolts Installed and secure 4. Ignition Off, key out 5. Electrical equipment Off 6. Radio master Off 7. Master Switch On 8. Flaps Down 9. Master switch Off 10. Fuel Valve On B. Left side 1. Main gear and tire Check 2. Baggage compartment Secure 3. Antenna Check 4. Aft fuselage condition Check 5. Tie down Remove 6. Vertical Stabilizer Check 7. Stabilator Check 8. Servo tab Check 9. Tie-down Remove
- 10. Rudder

C. Right Side

1. Vertical StabilizerCheck2. Aft fuselage conditionCheck3. Baggage compartmentSecure4. Main gear and tireCheck

D. Left wing

1.	Flap	Check
2.	Aileron	Check
3.	Wing tip	Check
4.	Wing leading edge	Check
5.	Pitot tube	Check
6.	Tie down	Remove
7.	Fuel cap	Secure

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Check

	Aircraft Operating Instructions	Aircraft Type: CTSW		
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FLIGITI DESIGN		Page: 8-2		
 Fuel tank vent Vent manifold 	Aligned Check			
E. Nose				
 Cowling Exhaust stack Nose gear Engine intakes Landing Light Spinner Propeller Cowling Oil quantity Fuel Static port 	•	follow the Rotax Manual) nd Check		
F. Right Wing				
 Leading edge Tie down Wing tip Aileron Flap Fuel cap 	Check Remove Check Check Check Secure	•		

Aligned Check

- Fuel cap
 Fuel tank vent
- 8. Vent manifold

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Engine start 8.2

 Preflight Parking Brake Carburetor heat Circuit breakers Radios and Electrical equipment Master Switch Anti-collision lights Fuel Valve Ignition key Choke Throttle Ignition Switch Choke Oil pressure Radios Flaps 	Complete Set Off In Off On Open In As required Closed Start and release Adjust Check Set Up			
8.3 Taxiing				
1. Brakes and Steering	Check			
Before takeoff				
 Parking Brake Seat belts Doors Flight Controls Flight Instruments 	Set Secure Closed Free and correct Set			

- 5. Flight Instruments
- 6. Choke
- 7. Carburetor heat
- 8. Throttle
- 9. Engine Indications
- 10. Ignition
- 11. Oil temperature
- 12. Throttle
- 13. Flaps
- 14. Trim
- 15. Radios
- 16. Parking Brake

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Off

Off

Idle

Set

Release

3200 RPM

Check Left, Right, & Both

Min 51°C / 124°F

Set for takeoff

Set for takeoff

(max. drop 300 RPM/max diff. 120 RPM)

Check

Normal takeoff 8.4

2. 3.	Flaps Throttle Carburetor heat Climb at MTOW:	0° to 15° Full Off	
	600 kg	95 km/h / 51 kts	flaps 15°
	472,5 kg	78 km/h / 42 kts	flaps 15°

Climb 8.5

1.	Power	5500 RPM (max. continuous)
2.	Best angle of climb speed	Vx = 66 kts flaps 0°
3.	Best rate of climb speed	Vy = 78 kts flaps 0°

3.	Best	rate	of	climb	speed
----	------	------	----	-------	-------

Cruise 8.6

1.	Power	Set
2.	Engine Instruments	Check

8.7 Descent

1.	Carburetor heat	As required
2.	Altimeter	Set

2. Altimeter

Before landing 8.8

- 1. Seatbelts
- 2. Airspeed
- 3. Flaps
- 4. Carburetor heat

Normal landing 8.9

Flaps Airspeed (VFE):

Flaps 0°	100 KCAS	185 km/h CAS
15°	80 KCAS	148 km/h CAS
30°	62 KCAS	115 km/h CAS
40°	62 KCAS	115 km/h CAS

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Secure
100 km/h / 54 kts
15° to 40°
Off

as desired, 40° for short field

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FLIGHT DESIGN		Page: 8-5
8.10 After landi	ng	
 Landing light Flaps 	Off Ret	ract
8.11 Shut dowr	1	
 Parking brake Radios Electrical equipm Ignition Master switch 	nent Off Off Off Off Off	
8.12 Short field	takeoff procedure	
Flaps Parking brake Power Brakes Rotate		
8.13 Balked lan	ding procedure	
Bower	E.ul	

Power	Full
Flaps	15°
Airspeed	110 km/h / 59 kts

8.14 Information on stalls, spins and other useful pilot information

Stalls

The CTSW exhibits conventional characteristics with a slight buffet at the onset of the stall. There is no tendency to roll in a coordinated stall. Directional control should be maintained through use of the rudder.

Recovery is also conventional: release pressure on the control stick to reduce the angle of attack. Apply full power, and slowly recover.

Spins

The CTSW is not certified for spins.

In the event of an unintentional spin:

- 1. Reduce power to idle
- 2. Center the ailerons
- 3. Apply rudder in the opposite direction of rotation
- 4. When the rotation stops, smoothly recover from the resultant dive.

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If an unintentional spin is entered and the altitude is such that a safe recovery cannot be made, the ballistic parachute system should be deployed.

Steep turns

Enter with coordinated use of rudder and ailerons. Increase pitch and power as necessary to maintain altitude and airspeed. Do not exceed 60° of bank angle.

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9 Aircraft Ground Handling and Servicing

9.1 Servicing fuel, oil and coolant

Fuel

The fuel tanks are equipped with vented fuel caps that are located on the upper surface of the wing. The fuel caps must be in place for flight, with the vents facing forward. A calibrated dip stick, with left tank and right tank indications, is supplied to check the fuel quantity. The aircraft must be grounded during refueling and secured from open flame.

Note: The aircraft finish may be damaged by exposure to fuel; any spills should be immediately cleaned up.

Oil

For an accurate oil measurement:

- 1. Set the Parking brake.
- 2. Check the Master switch is off, and the Ignition key is out.
- 3. Open the top cowling hatch.
- 4. Open the Oil tank.

5. Turn the propeller in the direction of rotation <u>until</u> you hear a pronounced gurgling sound from the oil tank. This the oil returning from the engine back to the oil tank. If you do not complete this procedure your oil level will read low.

6. Check the oil level. If it is not sufficient, remove the top cowling and add more oil to the tank. Be careful to not overfill.

Coolant

To check the coolant level:

- 1. Set the Parking brake
- 2. Check the Master switch is off, and the Ignition key is out.
- 3. Open the top cowling hatch.
- 4. Check the coolant level. It should be between min. and max. marks.

5. If it is not sufficient, remove the top cowling, open the cap of the coolant tank and add coolant to fill up the tank.

- 6. Make sure that no air is inside the cooling system.
- 7. Close the coolant tank cap.
- 8. If necessary, add coolant to the expansion tank.

9.2 Ground handling and tie-down instructions

Moving the CTSW

The aircraft can be moved by one person.

- 1. Check that the parking brake is off.
- 2. Check that the area around the aircraft is clear of obstacles and people.
- 3. Push down on the tail boom of the aircraft to lift the nose gear off the ground.

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Be careful not to damage antennas mounted on the fuselage' bottom.

4. Push the aircraft in needed direction.

Tie down instructions

1. Attach tie down lines from the ground to the tie-down rings on the undersurface of the wings.

2. Place the tail boom tie-down strap around the tail boom and secure to the ground with mooring lines.

3. Stop wheels with a wheel chocks.

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10 Required Placards and Markings

10.1 Airspeed indicator range markings

Aircrafts with LSA registration

Marking	Speed	Range
White range (flap operating range)	72 115 km/h	39 62 kts
Green range (normal operating range)	81 [91*]222 km/h	44 [49*] 120 kts
Yellow range (caution range)	222 269 km/h	120 145 kts
Red line (never exceed speed)	269 km/h	145 kts

* - with flaps in (-12°) position

Aircrafts with LTF registration

Marking	Speed R	lange
White range (flap operating range)	72 115 km/h	39 62 kts
Green range (normal operating range)	94 245 km/h	51 132 kts
Yellow range (caution range)	245 260 km/h	132 140 kts
Red line (never exceed speed)	301 km/h	163 kts

Aircrafts with BCAR Section S registration

Marking	Speed R	lange
White range (flap operating range)	61 122 km/h	33 66 kts
Green range (normal operating range)	74 219 km/h	40 118 kts
Yellow range (caution range)	219 278 km/h	118 150 kts
Red line (never exceed speed)	278 km/h	150 kts

10.2 Operating limitations on instrument panel

MAX: RPM 5800, EGT 1616F, CHT 248F, Oil Temp. 266F, Oil Press. 102 psi

or

MAX: RPM 5800, EGT 880°C, CHT 120°C, Oil Temp. 130°C, Oil Press. 7 bar

10.3 Passenger Warning

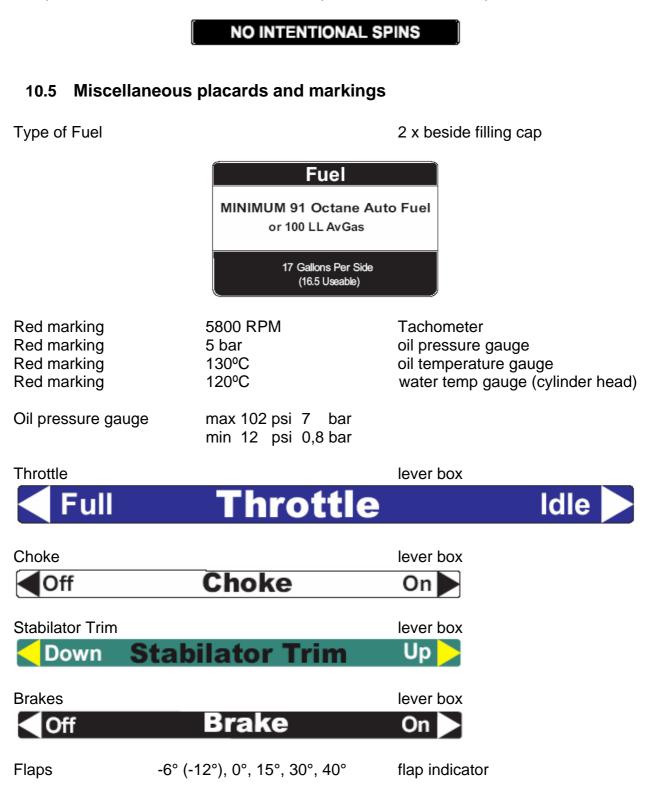
The warning^{*} "This aircraft was manufactured in accordance with Light Sport Aircraft airworthiness standards and does not conform to standard category airworthiness requirements" is placed on the instrument panel or in a place where a passenger will see it.

 * - actual for aircrafts with LSA registration only

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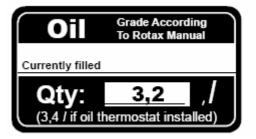
10.4 "NO INTENTIONAL SPINS"

The placard "NO INTENTIONAL SPINS" is placed close to the airspeed indicator.



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Oil quality



Circuit Breakers

Main Circuit Breakers

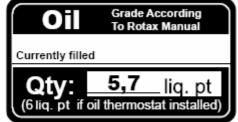
Fuses

Main fuses

Maintenance/packing interval

Baggage Compartment

Cowling hatch backside



right side of the central console

right side of the Central console

Switch panel (Middle Console, depends on panel type)

Instrument panel

BRS Manual & Chute placard

Baggage area

Bagg	age Compartment
max.	55 lbs. each side 25 kg.

Doors

External door side, under the window



Internal door side, under the window

OPEN Do Not Open Doors In-Flight CLOSED

	1	
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11 Supplementary Information

11.1 Familiarization flight procedures

See the Pilot Training Supplement for familiarization procedures*.

* - actual for aircrafts with LSA registration only

11.2 Pilot operating advisories

None at this time.

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12 List of amendments

Revision No.	Date released	Affected chapters	Affected pages	Approved by
Original Issue	28-Feb-2005	N/A	N/A	
1	20-Jun-2005	2 General Information	6; 8	
		3 Airplane and Systems Descriptions	13; 14	
		4 Operating Limitations	15; 17; 19	
		10 Required Placards and Markings	36	
2	05-Oct-2005	4.5 Crosswind and wind limitations	15	
		6 Performance	27	
		8.2 Engine starting	31	
		8.4 Normal takeoff	32	
		8.5 Best angle of climb speed (Vx); 8.6 Cruise	33	
		10.5 Miscellaneous placards and markings	36	
3	05-Apr-2006	Total revised; Name of document changed; insert part 12, Appendix 1, Appendix 2, Appendix 3, Appendix 4	1-62	
4	05-Dec-06	Added "Failure of the Dynon EMS" paragraph	29	
5	30-Dec-06	Document fully revised	1 -APP3-3	
5a	16-Apr-07	Oil characteristics updated	3-3	
		Point 3.5 carried to page 3-4	3-4	
		Never exceed speed values updated	4-2	
		Green range for LSA airplanes updated	10-1	
5b	13-Jul-07	Corrected airspeed for US- LSA version from 113 kts to 98 kts	4-2	
		List of amendments added	12-1, 12-2	
6	01-Apr-08	Name of document changed	i	
		App. 1 changed	1	
		App. 2 changed	2	

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		3.1:"FortheoptionalenginespleaseseeAppendix 1 (Equipment List)"deleted3.2:"FortheoptionalpropellerspleaseseeAppendix 1 (EquipmentList)"deleted3.3:"steamblastor MOGASfailing"changedto"vaporlockorinsufficientoctaneon autofuel"3.7Carbonmonoxide	3-1 3-2 3-2 3-9
		detector added 9.1: "3 to 4 times in the direction of rotation, while you hear the air gurgling in the oil tank" changed to "in the direction of rotation <u>until</u> you hear a pronounced gurgling sound from the oil tank. This the oil returning from the engine back to the oil tank. If you do not complete this procedure your oil level will read low."; "refill the oil tank" changed to "add more oil to the tank. Be careful to not overfill." 9.2: Title "Towing (moving)" changed to "Ground handling"; "Install mooring" changed to "Attach tie down";	9-1
7	20 4 7 7 00	changed to "chocks"	
7	29-Apr -08	8.4 corrected	8-4

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Appendix 1. Current equipment List

The current equipment list should be inserted here. Old equipment lists should be kept so that the history of the aircraft is properly documented. They should be marked by hand with the word "INVALID". The owner of the aircraft is responsible for ensuring that a valid equipment list is available.

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Appendix 2. Variants of instrument panels

Symbolic notations

- 1 Dynon EFIS 100 Flight information system
- 2 Dynon EMS 120 Engine monitoring system
- 3 Autopilot CT Pilot 2 Axis (Digiflight II)
- 4 Air Speed Indicator
- 5 Altimeter
- 6 Radio Garmin SL series & Transponder GTX series
- 7 Radio King KY series & Transponder KT series
- 8 GPS Garmin 496
- 9
- 10 Air speed indicator D 80mm
- 11 Three pointer altimeter D 80mm
- 12 Variometer D 57mm
- 13 Slip & bank indicator
- 14 UMA analogs (RPM meter, Oil pressure, Oil temperature, Cylinder head water temperature, Volt meter*)
- 15 Hobbs hour counter
- 16 Trutrack ADI

* - Volt meter excluded on CTSW Classic Light ready to fly modification.

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CTSW Classic Light

CTSW Classic Light base instrument panel



	-Feb-2005
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CTSW Classic Light additionally equipped with Honeywell Radio and Transponder



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		Revision Date. 29-Apt-2000

CTSW Classic Light additionally equipped with Garmin Radio and Transponder



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CTSW Classic

CTSW Classic base instrument panel



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CTSW Classic additionally equipped with Autopilot, Nightflight package with TruTrack ADI, Garmin GPS, Radio and Transponder



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CTSW Advanced

CTSW Advanced (Dynon) instrument panel



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CTSW Advanced additionally equipped with Autopilot, Nightflight package, Garmin GPS, Radio and Transponder



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Appendix 3. Samples of the Weight & Balance and Equipment List

Sample of the Weight & Balance and Equipment List for aircrafts with LSA registration

Nome Cigno Model Producer Cigno Serrar Nr Ox00x.0X Ass Name Model Producer Double Serrar Nr Ox00x.0X Ass Name Model Producer Double Serrar Nr Ox00x.0X Ass Name Model Producer Double Ending Edge Ox00x.0X Ass Name Name Name Meight Ann Name Name Name Name Meight Meight Ann Name Name Name Meight Nam Nam Name <th>Weight</th> <th>Weig</th> <th>tht & Balan</th> <th>Weight & Balance and Equipment List</th> <th>ment List</th> <th></th> <th>Tricycle Gear AC</th> <th></th> <th></th> <th></th>	Weight	Weig	tht & Balan	Weight & Balance and Equipment List	ment List		Tricycle Gear AC			
Serat-Nr 0x00x0x ASI 6FM3443 Ladion-Nr. 5X4X0X0 ASI 6FM3443 Ladion-Nr. Each meler 12712011-33 Lono-Nr. SX4X0X0 Asi Lono-Nr. Versions Lips B-1111 Moment Moment Moment Max 260 lbs.) Arran B-1111 Rescue system B-111130 Moment Max 260 lbs.) Moment Total Moment 2016s.max) Arran Arran Saladary Arran Arran Saladary Arran Arran Max 260 lbs.) Arran Arran Jage Arran Arran Jage Arran Arran Jage			CTSW Classic		Name	Model	Producer	·	Weight, Ib	Moment, Ib*in
Motor-Nir 5X4X0X0 Atimeter ALT20INF-3 Topoffyleringe tunnel Topoffyleringe tunnel Topoffyleringe tunnel Atimeter ALT20INF-3 Topoffyleringe tunnel Topoffyleringe tunnel Compaset Varianter/YSI Atimeter ALT20INF-3 Topoffyleringe tunnel Weight and Balance Worksheet Compaset Varianter/YSI Atimeter ALT20INF-3 Sight Atimeter Monent Techometer 19-519-211 Techometer 19-519-211 Sight and Dalance Worksheet Weight (130 Atime Monent Techometer 19-519-211 Sight and Dalance Worksheet Monent Total Monent 11-8 Monenter 19-519-211 Total Action Total Monent Total Monent Total Bagage (55 hs. max) Attributer 12-113/300F0/20 Sight (1320 max) Monent Total Basic Firefram gauge Mol (11-12/97) Sight (1320 max) Total Basic Firefram gauge Mol (11-12/97) Firefram gauge Sight (1320 max) Total Basic Firefram gauge Mol (11-10/92) Fir			X0-X0-X0		ASI	6FMS443	Winter	-4.72	0.48	-2.29
Edge Airpath selege tunnel variometer/NSI 8-210-20 selege tunnel variometer/NSI 8-210-20 ind Balance Worksheet tachometer 19-519-211 ind Balance 200-5 Balatey N12115/33067020 inmaxi 43.0 Dipressure gauge N12115/33067020 inmaxi 43.0 Dipressure gauge N12115/33067020 inmaxi 43.0 Dipressure gauge N12115/33067020 inmaxi 11.8 Materiang gauge N12115/33067020 inmaxi 10.0 Dipressure gauge N12115/33067020 inmaxi 10.0 Dipressure gauge N12116/33067020 inmaxi 10.0 Dipressure gauge N121116/33067020 inmaxi 10.0 Dipressure gauge N121116/33067020 inmaxi 10.0 Dipressure gauge N121116/33067020 inmaxi 10.0 Dipressure gauge N121110917/0600<			5X4X0X0		Altimeter	ALT20INF-3	FALCON GAUGE	-4.72	1.34	
selage tunnel Variometer/VSI $8-210-20$ und Balance Worksheet Ind Balance Worksheet Variometer/VSI $8-210-20$ Neight (In-) (Ib-in) (Ib-in) Z60 lbs.) 20.5 11.8 No1113Y130P070 S60 lbs.) 20.5 11.8 No1113Y130P070 S60 lbs.) 20.5 11.8 No1113Y130P070 S10 20.5 11.8 No1113Y130P070 Difference gauge No1113Y130P070 S60 lbs.) 20.5 11.8 No1113Y130P070 Difference gauge No1113Y130P070 S18.7) 20.5 11.8 12.18 maxin 43.0 0.01 11.8 $113Y130P070$ maxin 43.0 0.01 $11.13Y130P070$ maxin 43.0 0.01 $11.13Y130P070$ maxin 43.0 $11.13Y130P070$ $11.13Y130P070$ maxin 13.6 $11.13Y130P070$ $11.13Y130P070$ maxin 12.11 12.110 $11.13Y130P070$ maxin 11.1100177060 11.1100177060 maxin 11.1100177060 maxin 12.110					Compass	Airpath	Airpath Instrument CO	-3.94	0.59	
Ind Balance WorksheetInd Balance WorksheetTachometer19-519-211WeightAimMoment $(lbs.)$ (ln) (ln) (ln) $(lbs.)$ (ln) (ln) (ln) 260 lbs.) 20.5 $(lb'in)$ 260 lbs.) 20.5 $(lb'in)$ 260 lbs.) 20.5 $(lb'in)$ 260 lbs.) 20.5 $(lb'in)$ 260 lbs.) 43.0 $(lb'in)$ 260 lbs.) 43.0 $(lb'in)$ 260 lbs.) 43.0 $(lb'in)$ 210 lbs. $a3.0$ $(lb'in)$ $axix$ 43.0 $(lb'in)$ $axix$ $a3.0$ $(lb'in)$ $axix$ $a1.0$ $a1.0$ $a1.0$ $a1.0$ $a1.0$ $a1.0$ $a1.0$ <		ge tunnel			Variometer/VSI	8-210-20	U.M.A., INC	-4.33	0.48	
Weight Arm Moment (lbs.) (in) (in) (in) 265 118 00 265 118 01 205 20.5 01 205 118 01 3.1 20.5 01 axix 43.0 01 max 43.0 01 max 43.0 01 max 118 01 max 118 01 max 111 01 max 11 01 max 11 01 max 12 10 max 14 10 max 14 10 max 14 100 max 14 100 111 10 17 12 12 10 13 14 15 14 15 16 <t< td=""><td>Weight and I</td><td></td><td></td><td></td><td>Tachometer</td><td>19-519-211</td><td>U.M.A., INC</td><td>-5.12</td><td>0.31</td><td>-1.58</td></t<>	Weight and I				Tachometer	19-519-211	U.M.A., INC	-5.12	0.31	-1.58
(Ibs.) (in.) (Ib.in) (Ibinary)		Weight	Arm	Moment	Radio	KY97ATSO	Bendix/King	-11.42	3.96	-45.27
Signation Instruction Instruction <thinstruction< th=""> <thinstruction< th=""> <</thinstruction<></thinstruction<>		(lbs.)	(in.)	(lb*in)	Oilpressure gauge		-	-5.12	0.26	-1.35
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Empty weight				Oiltemp gauge	N12113V300F0A0	_	-5.12	0.26	-1.35
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Fuel (34.32 gal Max)		11.8		Watertemp gauge			-5.12	0.26	-1.35
s.) 20.5 max) 43.0 max) 1001 max) 1000 <tr< td=""><td>Pilot (Min 120 lbs. Max 260</td><td>lbs.)</td><td>20.5</td><td></td><td>Battery</td><td>SBS 8</td><td>HAWKER</td><td>-22.83</td><td>90.9</td><td>-138.32</td></tr<>	Pilot (Min 120 lbs. Max 260	lbs.)	20.5		Battery	SBS 8	HAWKER	-22.83	90.9	-138.32
max/ Ibs.max) 43.0 43.0 Ibs.max) 43.0 (lock Ibs.max) 43.0 (lock Ibs.max) 43.0 (lock Ibs.max) 100 Ibs.max) 100 <td< td=""><td>Passenger (Max 260 lbs.)</td><td></td><td>20.5</td><td></td><td>Rescue system</td><td>BRS-6 1350HS</td><td>BRS</td><td>48.03</td><td>33.04</td><td>1586.94</td></td<>	Passenger (Max 260 lbs.)		20.5		Rescue system	BRS-6 1350HS	BRS	48.03	33.04	1586.94
Ibs. max) 43.0 Ibs. max) 43.0 Imaxy Index Index Index Index <td>Port Baggage (55 lbs. max)</td> <td></td> <td>43.0</td> <td></td> <td>Fly.Dat</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Port Baggage (55 lbs. max)		43.0		Fly.Dat					
Imax Al (Horizon) 8-18.7) Total Moment / Total Weight = CG 8-18.7) Total Moment / Total Weight = CG For an Moment / Total Weight = CG Transponder Center of Gravity Limit Towhook Center of Gravity Limit Autopilot Center of Gravity Limit Autopilot Autopilot N141100917V060 Autopilot Autopilot Autopilot Colimeter Autopilot Coli	Starboard Baggage (55 lbs.	max)	43.0		Clock		Hobbs	-5.12	0.22	-1.13
Imax Transponder KT76ATSO 8-18.7) Total Moment / Total Weight = CG Turn and Bank KT76ATSO Center of Gravity Limit Center of Gravity Limit Center of Gravity Limit Center of Gravity Limit Center of Gravity Limit N141100917V060 Imax Autopilot N141100917V060 Autopilot Control Weight definition Imax Autopilot Control Weight definition Imax Imax Imax Imax <td>Gross (1320 lbs. max)</td> <td></td> <td></td> <td></td> <td>AI (Horizon)</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Gross (1320 lbs. max)				AI (Horizon)					
B-18.7) Total Moment / Total Weight = CG Total Moment / Total Weight = CG Center of Gravity Limit Center of Gravity L	Take Off Weight (1320 ma.	x)			Transponder	KT76ATSO	Bendix/King	-11.42	2.20	-25.15
Total Moment / Total Weight = CG Total Moment / Total Weight = CG Center of Gravity Limit Control Meight definition Control Meight definition <	Flight CG(Range 13.28-18.	7)			Turn and Bank					
Center of Gravity Limit Center of Gravity Limit Center of Gravity Limit Autopliot Au	Weight*Arm=Moment	Total Mome	nt / Total We	iaht = CG	GPS EI T	AK-450	AMFRI-King Co	63 39	3.77	238.74
Center of Gravity Limit Center of Gravity Limit Contracter 1005	c.				Towhook)) 			
1305 1305		enter of Gravity I imi	-		Autopilot					
1305 1305 1305 1305 1305 1005)				Voltmeter	N141100917V060		-5.12	0.24	-1.24
1305 13 13 13 13 13 13 13 13 13 13					Altitude holder					
105 105 105 105 105 105 105 105	1305				Empty weight dei	finition				
105 105 00 00 00 00 00 00 00 00 00 00 00 00 0						×	E			
1105 1005	1205									
1105 1005	(q				J V	$\langle \rangle$	₩ 			
105 105 105 105 105 105 105 105					7	F)			Arms (in)
105 905 905 12 13 14 15 16 17 18 19 20 10 10 10 10 10 10 10 10 10 1					ġ	ی ا			8	
12 13 14 15 16 17 18 19 20 CG Location (Inches)					5	q			q	
12 13 14 15 16 17 18 19 20 CG Location (Inches)							Reference	gross (lb)	tare (lb)	net (lb)
12 13 14 15 16 17 18 19 20 CG Location (Inches)	ans						from G1 from G2			112.8 603.5
12 13 14 15 16 17 18 19 20 CG Location (Inches)								Weinht G=		716.3
12 13 14 15 16 17 18 19 20 CG Location (Inches) Fedchun	805						CG empty (in) accordii	ng G2*b/G-a=	!	13.59
Fedchun	13	15					empty CG limits from	9.45. to. 14	1.1 /	
		CG Location (Inch	les)		Fedchun		Kherson, Ukraine		12/0X/200X	
Weighed by Location					Weighed by	1	Location	1	Date	1

The acceptable empty Cg range is 9.45 to 14.17 inches.

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Refer Dr.MIG.443 Winter -0.12 0.12 0.01 Inset Alrapath Instrument CO -0.11 0.02 0.01 0.01 Impass: Alrapath Instrument CO -0.11 0.02 0.01 0.01 Impass: Alrapath Instrument CO -0.13 0.01 0.01 0.01 Impass: Alrapath Instrument CO -0.13 0.01 0.02 0.01 Impass: Alrapath Instrument CO -0.13 0.12 0.12 0.12 Impass: Bendix/King -0.03 0.12 0.12 0.12 0.12 Impass: BES-6 1350HS Bendix/King -0.13 0.11 0.12 Impass: BES-6 1350HS BES 1.12 1.10 0.12 Impass: BES-6 1350HS BES 0.10 0.11 0.10 Impass: Max Max 0.10 0.12 0.11 0.11 Imposs BES-6 1350HS BES 0.10 </th <th>CTSW</th> <th>CTSW Classic and equipment and</th> <th>Name</th> <th>Model</th> <th>Producer</th> <th>C.g.posi- tion, m</th> <th></th> <th>Moment, kg*m</th>	CTSW	CTSW Classic and equipment and	Name	Model	Producer	C.g.posi- tion, m		Moment, kg*m
AXX000 Adimeter ALT20INF-3 FALCON GAUGE -0.12 0.01 Amm Moment E202:00 Jugash Instrument CO -0.13 0.14 Amm Moment Regmin 2.028 1.18 0.023 1.18 Amm Moment Regmin 2.028 0.14 1.22 0.13 0.12 Amm Moment Regmin Momenter 19-519-211 U.M.A., INC -0.13 0.12 Oldensing gauge IN2113/0300FDAD U.M.A., INC -0.13 0.12 0.12 Oldensing gauge IN2113/0300FDAD U.M.A., INC -0.13 0.12 0.12 Oldensing gauge IN2113/0300FDAD U.M.A., INC -0.13 0.11 0.12 Oldensing FPJ ass SES 6 1300HS BES 1.122 0.10 0.11 Oldensing FP ass Audenter I Altabling -1.12 0.11 1.171 Total Weight = C6 EU Moment I Altabling -0.13 0.11	2	X-DX	ASI	6FMS443	Winter	-0.12	0.22	-0.026
Amm Mingeth Airgeth Airgeth Airgeth Nith 0.11 0.22 Amm Woment Tachometer 19-510-20 U.M.A., INC -0.11 0.22 1 Tachometer 19-510-20 U.M.A., INC -0.13 0.14 0.33 0.52 Demoter 19-510-20 U.M.A., INC -0.13 0.12 0.33 0.52 Demoter IV27305PAD U.M.A., INC -0.13 0.12 0.52 Demoter IV2113V1305PAD U.M.A., INC -0.13 0.12 0.52 Demoter IV2147305PAD U.M.A., INC -0.13 0.12 0.52 Paster BRS-6 1350HS BRS -0.13 0.12 0.52 Paster BRS-6 1350HS BRS -0.12 0.12 10.0 Demoter IV141005HY00 Bendix/King -0.23 11/1 Transponder IV141005HY00 Bendix/King -0.13 0.11 11/1 Temsponder IV141100	×	XOXO	Altimeter	ALT20INF-3	FALCON GAUGE	-0.12	0.61	-0.073
Main Variameter/VSI 8-210-20 U.M.A., INC -0.11 0.02 Aim Momenti Tachometer 19-519-211 U.M.A., INC -0.13 0.12 Min Kgrm Momenti Radio -0.13 0.12 -0.13 0.12 0.32 Dimessure gauge IN12113/0300700 U.M.A., INC -0.13 0.12 0.32 Dimessure gauge IN12113/0300700 U.M.A., INC -0.13 0.12 0.32 Dimessure gauge IN12113/0300700 U.M.A., INC -0.13 0.12 0.45 Fibrat BISS 1.00 MA., INC -0.13 0.10 0.52 Fibrat BISS BISS BISS BISS 1.10 -1.12 0.11 1.09 Transported MM.ER A.M.ER -0.13 0.10 -1.12 0.10 1.06 Fibrat Matheter Matheter Matheter -0.13 0.11 -1.11 1.06 Fibrat Matheter Matheter			Compass	Airpath	Airpath Instrument CO	-0.1	0.27	-0.027
Arm Momenter 19-519-211 U.M.A., INC 0.13 0.14 0.30 0.80 Momenter 19-519-211 U.M.A., INC 0.013 0.12 0.30 0.52 0.10 Mod. Nict 0.013 0.12 0.12 0.30 0.52 0.10 Mod. Nict 0.13 0.12 0.12 0.52 0.52 0.52 DMA., INC 0.13 0.12 0.12 0.52 0.52 DMA., INC 0.13 0.12 0.12 0.12 0.52 DMA., INC 0.14 Mod. Nict 0.12 0.12 0.12 0.52 DMA., INC 0.12 Mod. Nict 0.12 0.12 0.12 0.52 DMA., INC DMA., INC 0.12 0.12 0.12 0.12 0.51 DMA., INC DMA., INC 0.12 0.12 0.11 1.11 1.11 1.08 Modeler Ithenter Ithenter Ithenter 0.12 0.11 1.11 1.11 <td></td> <td></td> <td>Variometer/VSI</td> <td>8-210-20</td> <td>U.M.A., INC</td> <td>-0.11</td> <td>0.22</td> <td>-0.024</td>			Variometer/VSI	8-210-20	U.M.A., INC	-0.11	0.22	-0.024
Arm Moment Tadio Kr97ATSO Bendio/King 0.29 18 -0 (m) (kgm) (kgm) 0.12113/13007D70 U.M.A., INC -0.13 0.12 -0 0.20 0.20 Natientemp gauge N12113/13007D500 U.M.A., INC -0.13 0.12 -0 0.52 Diterep gauge N12113/13007D500 U.M.A., INC -0.13 0.12 -0 0.52 Diterep gauge N12113/01070500 U.M.A., INC -0.13 0.12 -0 0.52 Diterep gauge N12113/01070501 BRS 1.12 10.12 0 0 12 12 12 10 12			Tachometer	19-519-211	U.M.A., INC	-0.13	0.14	-0.018
(m) (kg*m) Olicresture gauge N12113/130PD70 U.M.A., INC -0.13 0.12 -0.013 0.12 -0.013 0.12 -0.013 0.12 -0.013 0.12 -0.013 0.12 -0.013 0.12 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.010 -0.013 0.011 -0.013 0.011 -0.013 0.011 -0.013 <td>A</td> <td>\vdash</td> <td>Radio</td> <td>KY97ATSO</td> <td>Bendix/King</td> <td>-0.29</td> <td>1.8</td> <td>-0.522</td>	A	\vdash	Radio	KY97ATSO	Bendix/King	-0.29	1.8	-0.522
0.320 0.01emp gauge N12113730EAA0 U.M.A., INC -0.13 0.12 -0 0.62 0.62 0.62 N261161/300F200 U.M.A., INC -0.13 0.12 -0 0.62 0.62 Platex BRS-6 1350HS BRS-6 1350HS BRS-6 1350HS 0.12 -0.13 0.12 -0 0	-		Oilpressure gauge	N04113V130P070	U.M.A., INC	-0.13	0.12	-0.016
030 032 032 012 013 012 0 052 052 012 013 012 0 052 052 052 012 0 052 052 052 100 0 052 052 052 012 0 052 052 052 012 0 052 052 052 010 0 100 0 0 0 0 100 0 0 0 0 100 0 0 0 0 100 0 0 0 100 0 0 0 0 100 0 0 0 100 0 0 0 100 0 0 0 101 0 0 0 101 0 0 0 101 0 0 0 101 0 0 0 101 0 0 0 101 0 0 0 101 0 0 0 101 0 0 101 <t< td=""><td></td><td></td><td>Oiltemp gauge</td><td>N12113V300F0AD</td><td>U.M.A., INC</td><td>-0.13</td><td>0.12</td><td>-0.016</td></t<>			Oiltemp gauge	N12113V300F0AD	U.M.A., INC	-0.13	0.12	-0.016
0.62 Battery 285.8 HAWKER -0.88 2.75 -1 0.02 109 100 1.02 1.22 150.01 0.10 -0 1.09 1.09 1.09 0.10 -0.13 0.10 -0 <td< td=""><td>o</td><td>30</td><td>Watertemp gauge</td><td>N12116V300F020</td><td>U.M.A., INC</td><td>-0.13</td><td>0.12</td><td>-0.016</td></td<>	o	30	Watertemp gauge	N12116V300F020	U.M.A., INC	-0.13	0.12	-0.016
0.62 Rescue system BRS-0 1360HS BRS 1.22 15.0 18 1.09 Hobbs Hobbs 0.010 0.010 0 1.09 Hobbs AI (Horizon) Hobbs 0.010 0 1.09 AI (Horizon) AI (Horizon) Hobbs 0.010 0 2 loss Dotation MRER-King Co 1.61 1.71 2 2 PS Aitopolici N141100917V060 U.M.A., INC 0.13 0.11 0 2 PS Aitopolici N141100817V060 U.M.A., INC 0.13 0.11 0 2 PS Empty weight definition Empty weight definition 0.16 0	o	52	Battery	SBS 8	HAWKER	-0.58	2.75	-1.595
1.00 1.00 1.00 0.10 0.10 0.10 1.08 1.00 1.00 0.10 0.10 0.10 1.01 1.01 1.01 0.10 0.10 0.10 1.01 1.01 1.01 0.10 0.10 0.10 1.01 1.01 1.01 0.10 0.10 0.10 1.01 1.01 1.01 1.01 0.10 0.10 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 1.01 <td>0</td> <td>52</td> <td>Rescue system</td> <td></td> <td>BRS</td> <td>1.22</td> <td>15.0</td> <td>18.300</td>	0	52	Rescue system		BRS	1.22	15.0	18.300
100 100 0.10 0.10 0.10 0 Al (Horizon) I (Horizon) I (Horizon) 0.10 0 Transponder KT76ATSO Bendix/King -0.20 1.0 0 Transponder Transponder MERI-King Co 1.61 1.71 2 Autopilot Weight = CG Nutrueter N141100917V060 UM.A., INC -0.13 0.11 -0 Autopilot Methods Methods Methods Methods -0.13 0.11 -0 Autopilot Notimeter N141100917V060 UM.A., INC -0.13 0.11 -0 Autopilot Methods Methods Methods -0.13 0.11 -0 Autopilot	-	60	Fly.Dat					
Al (Horizon) Al (Horizon)<	-	60	Clock		Hobbs	-0.13	0.10	-0.013
Transponder KT76ATSO Bendix/King -0.29 1.0 -0 Turn and Bank Turn and Bank EL AK-450 AMERI-Húng Co 1.61 1.71 2 Turn and Bank EL Aktopilot MAA., INC -0.13 0.11 2 Autopilot N141100917V060 U.M.A., INC -0.13 0.11 2 Autopilot Interference G=G+G1 G=G+G2 -0.13 0.11 -0 0.45 0.5 Max Max Max Max -0 -0 0.45 0.5 Max Max Max Max -0 -0 0.45 Max Max Max Max -0 -0 -0 0.45 Max Max Max -0 -0 -0 -0 0.45 Max Max Max -0 <			AI (Horizon)					
Turn and Bank Turn and Bank Turn and Bank Total Weight = C5 Turn and Bank AK-450 AMERI-King Co 1.61 1.71 2 Cohnock N141100917V060 U.M.A. INC -0.13 0.11 -0 Autopilot Voltmeter N141100917V060 U.M.A. INC -0.13 0.11 -0 Empty weight definition Empty weight definition -0.13 0.11 -0 -0 -0 0.45 0.5 C C C -0.13 0.11 -0 0.45 0.5 C C -0.1			Transponder	KT76ATSO	Bendix/King	-0.29	1.0	-0.290
Total Weight = C6 GPS AK450 AMERI-King Co 1.61 1.71 2 EUT AK450 UN41100017V060 U.M.A., INC -0.13 0.11 -0.13 <			Turn and Bank					
Total Weight = CG ELT Art-450 AMERI-King Co 1.1/1 2 Autopilot Voltmeter N141100917V060 U.M.A., INC -0.13 0.11 -0.13 Autopilot Empty weight definition Empty weight definition -0.13 0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 -0.13 -0.11 <td< td=""><td></td><td> </td><td>GPS</td><td></td><td></td><td></td><td></td><td></td></td<>			GPS					
0.11 Townook Autopilot 0.1141100917/060 0.013 0.11 0 Autopilot Volumeter 0.1141100917/060 0.013 0.11 0 Autopilot Compare 0 0 0 0 0 Autopilot Compare 0 0 0 0 0 Autopilot Compare 0 0 0 0 0 Autopilot Compare Compare 0 0 0 0 Autopilot Compare Compare Compare 0 0 0 Autopilot Compare Compare Compare Compare 0 0 Autopilot Compare Compare Compare Compare Compare Compare Compare Autopilot Compare Compare Compare Compare Compare Compare Compare Compare Compare Autopilot Compare Compare <td>Ĕ</td> <td>stal Weight = CG</td> <td>ELT</td> <td>AK-450</td> <td>AMERI-King Co</td> <td>1.61</td> <td>1.71</td> <td>2.753</td>	Ĕ	stal Weight = CG	ELT	AK-450	AMERI-King Co	1.61	1.71	2.753
Conception N141100917V060 U.M.A., INC -0.13 0.11 -0. Altitude holder N141100917V060 U.M.A., INC -0.13 0.11 -0. Altitude holder Altitude folder Introde folder Introde folder -0.13 0.11 -0. Altitude folder Introde folder Introde folder Introde folder -0.13 0.11 -0. Altitude folder Introde folder Introde folder Introde folder -0.13 0.11 -0. Out Introde folder Introde folder Introde folder -0.13 0.11 -0. Out Introde folder Introde folder Introde folder Introde folder -0.13 Introde folder -0.13 Introde folder -0.13 Introde folder -0.14			Towhook					
Altitude holder Altitude holder Empty weight definition Empty weight definition 0.5 Meight definition 0.5 Meight G= 0.6 Meight G= 0.7 Meight G=			Voltmeter	N141100917V060	U.M.A., INC	-0.13	0.11	-0.014
Imply weight definition Emply weight definition Imply weight definition Imply cd limits from240to360	- 6		Altitude holder					
Definition of the form of the			Empty weight defi	nition				
D. Federun C. C. empty CG limits from240to360 Kherson, Ukraine C. Okraine C.			-					
D. Federun C.	+		` _	,-	E			
D. Federun C.G empty (mm) according G2*b/G-a= C.G empty CG limits from240to360 Kherson, Ukraine 12/0X/200X	H		*					
D. C.G. empty (mm) according G2*b/G-a= C.G. empty (mm) according G2*b/G-a= empty CG limits from240to360 Kherson, Ukraine Kherson, Ukraine Kherson, Ukraine	++		Į		¥ Y			
Difference and the second of t]]])			
Gr Gr B 1 Gr B 1 Gr B 1 Feference gross (kg) tare (kg) Meight G= 33 0.5 Weight G= 0.5 CG empty (mm) according G2*b/G-a= 0.5 Eedchun Kherson, Ukraine 12/0X/200X	H		- -	0				Arm (mm)
0.45 0.45 0.45 0.5 0.5 0.12/00/00/000	$^{+}$		5	ĉ			e	885
Reference gross (kg) tare (kg) net (k From G1 from G2 weight G= 33 From C2 weight G= 33 33 0.45 0.5 0.5 0.1 12/0X/200X	Ħ		׀				þ	1460
From G1 From G1 <t< td=""><td>+</td><td></td><td></td><td>[</td><td>Reference</td><td>Е</td><td>(ka)</td><td>net (ka)</td></t<>	+			[Reference	Е	(ka)	net (ka)
0.5 From G2 CG empty (mm) according G2*b/G-a= empty CG limits from240to360 Fedchun Kherson, Ukraine 12/0X/200X	Ħ				from G1	Т	(Rul and	18.1.2
0.5 CG empty (mm) according G2*b/G-a= empty CG limits from240to360 Fedchun Kherson, Ukraine 12/0X/200X	+				from G2			2110
0.45 0.5 Fedchun Kherson, Ukraine 12/0X/200X	Ħ				70 1101	0.11.1.100		417
0.45 0.5 Fedchun Kherson, Ukraine 12/0X/200X	$^{+}$					weight G=		325.2
0.45 0.5 Eddhun Kherson, Ukraine	Н				CG empty (mm) accord	ling G2"b/G-a	=	345
Fedchun Kherson, Ukraine					empty cig ilmits from	96501042	_	
	_		Fedchun		Kherson, Ukraine		12/0X/200X	Γ

The acceptable empty Cg range is 240 to 360 mm.

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Original Issue Date: 28-Feb-2005 Revision Date: 29-Apr-2008

Aircraft Operating Instructions

Aircraft Type: **CTSW** Page: 11 FLIGHT DESIGN

Aircraft Type: **CTSW** Page: 12

Sample of the	Weight &	Balance	and	Equipment	List for	aircrafts	with	BFU	<u>/ LTF-UL</u>
<u>registration</u>									

Weight			We	Weight & Balance and Equipment List	and Equipme	ent List		Tricycle Gear AC	
and	Model		CTSW Classic			Name	Model	Producer	C.g. position
Balance	Serial-Nr		XX-1X-2X			ASI	16-311-161	Winter	-120
Sheet	Motor-Nr.		4X3X4X5 -			Altimeter	6FMS441	Winter	-120
Technical da	Fechnical data according data sheet					Compass	Airpath	Airpath Instrument CO	100
Datum:			Leading Edge			Variometer/VSI			
Leveling:			Top of fuselage tunnel	ge tunnel		Tachometer			•
ltem		kg	NWCP kg	NWCP kg Empty weight		Radio	AR4201	BECKER	-220
Wing right		35,5			299,8 kg	Oilpressure gauge		6 .	
Wing left		35,7		Useful load		Oiltemp gauge			
Fuselage		217,1	217,1		172,7 kg	Watertemp gauge			
				MTOW		Battery	SBS 8	HAWKER	-580
Elevator		9,3	9,3		472,5 kg	Rescue system			
Rudder	I	2,2	2,2	2,2 Weight NWCP		Fly.Dat	Fly-Dat	ROTAX	-190
Wing struts (50%)	(20%)	-		incl.useful load	401,3 kg	Clock			
useful load			172,7	remarks		AI (Horizon)			
total weight		299,8				Transponder	BXP6401-2-(01)	BECKER	-230
						Slip		Winter	-100
Reference	gross (kg) ta	tare (kg) Ir	net (kg)		Arm (mm)	GPS			
from G1			64,9			ELT			
from G2			234,9	q	1445	Towhook			
÷	>	Weight G=	299,8			Autopilot			
				1		Voltmeter			
ВР	× S	C	F						n.
-			_		4				
ļ	/ E		~						
Ţ	ff If	P							
4	Ļ	G=G1+G2							
3-	¥								
е 5	<mark>ہے</mark>								
							*		
CG empty		253							
	-9/0.79	/07		l				Venerine	
from 240 to	from 240 to 360 at	1 8 990	ko ko	Fedchun		Kher	Kherson, Ukraine	12/UX/200X	
			R	weigned by	ý		-ocation	Late	

The acceptable empty Cg range is 240 to 360 mm.

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