PILOT'S OPERATING HANDBOOK

MODEL A5

FOUNDER'S EDITION

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ICON Aircraft / 2141 ICON Way, Vacaville, CA 95688

Chapter 01

GENERAL INFORMATION

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1.1 AIRPLANE INTRODUCTION

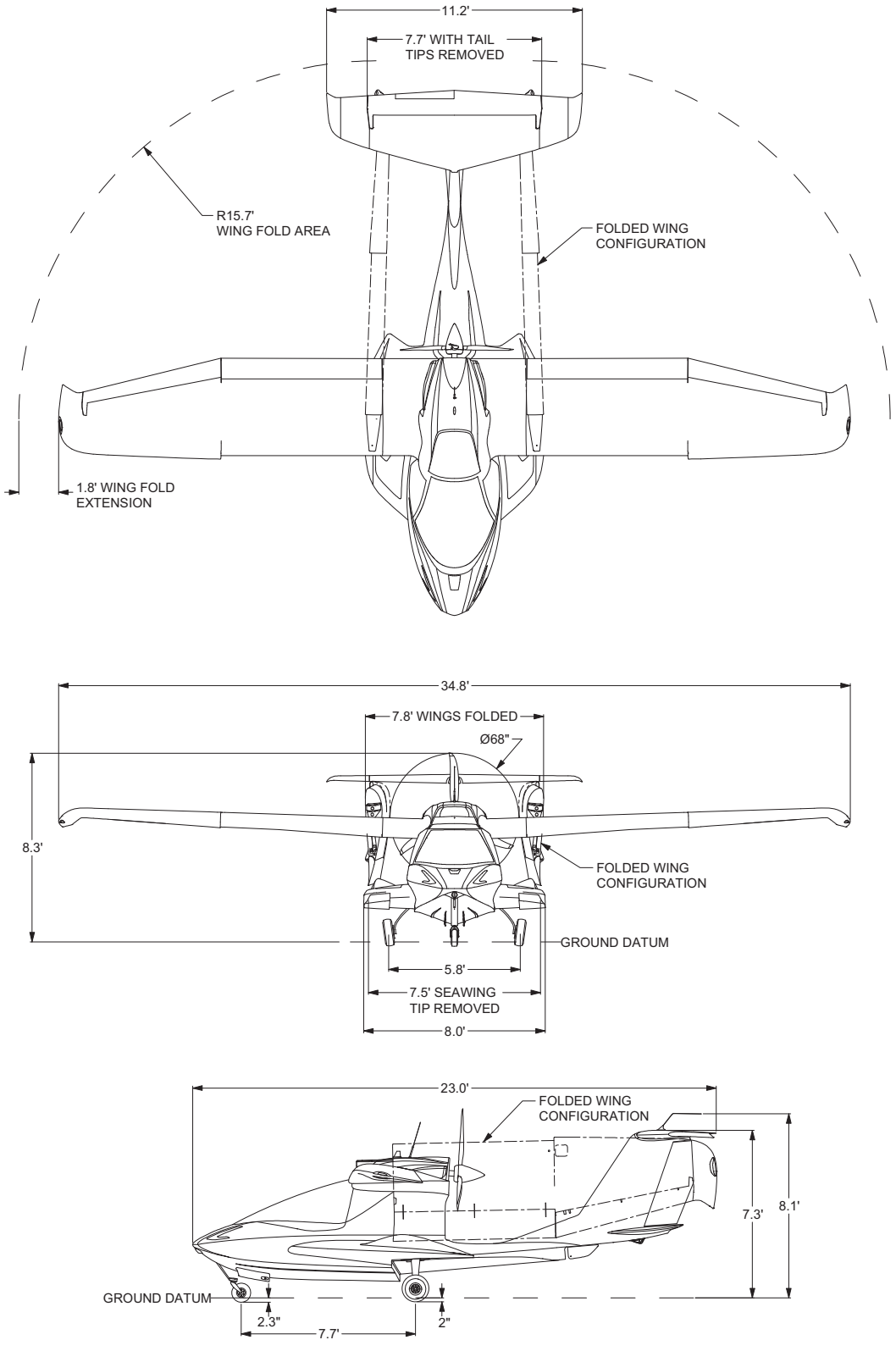
The ICON A5 is a two-seat, single-engine, amphibious Light Sport Aircraft. The A5 has a conventional high wing, tail-aft configuration with ailerons, flaps, elevator, rudder and water rudder control surfaces. The wings are manually foldable with the flight controls (ailerons and flaps) connecting automatically. The tricycle landing gear is retractable. The A5 is equipped with a Rotax 912iS Sport, 4-cylinder, horizontally-opposed, reciprocating engine of 100 horsepower. Installed equipment provides for flight in day and night VFR conditions. Fuel is contained in a single fuselage-mounted tank. Flight controls employ conventional push-pull tubes, torque tubes and cables. The primary flight controls are conventional sticks and rudders (with toe brakes) for each seat. An electrically operated pitch trim tab is controlled from the pilot's (left seat) stick only.

1.1.1 DESCRIPTIVE DATA

Parameter	Value
Wing Span	34.8 ft
Wing Area	135 ft^2
Aspect Ratio	9.0
Overall Length	23.0 ft
Overall Height at Ground Attitude	7.5 ft
Wheel Base	7.7 ft
Main Landing Gear Track Width	5.8 ft
Draft at Gross Weight, Landing Gear Up	14 in
Draft at Gross Weight, Landing Gear Down	26 in

1.2 ILLUSTRATIONS

FIGURE 1-1
AIRCRAFT 3-VIEW DRAWING



1.3 SUMMARY OF PERFORMANCE SPECIFICATIONS

Parameter	Value
Gross Weight	1510 lb_f
Top Speed at SL, V_H (MCP, 5500 RPM)	95 KTAS
Cruise Speed, 5000 RPM, 8000 ft	84 KTAS
Range (5000 RPM, 8000 ft, including takeoff and climb from SL)	427 nm (with 45 min reserve)
Best Angle of Climb Speed, V_X (Flaps 0°)	54 KIAS
Best Angle of Climb Speed, V_X (Flaps 15°/30°)	50 KIAS
Best Rate of Climb Speed, V_Y	58 KIAS
Rate of Climb at V_X (SL)	616 ft/min
Rate of Climb at V_Y (SL)	629 ft/min
Stall Speed, V_S (Flaps and landing gear up)	45 KIAS
Stall Speed, V_{S0} (Flaps and landing gear down)	39 KIAS
Total Fuel Capacity	20.1 US gallons
Total Usable Fuel	20 US gallons
Approved Types of Fuel	Unleaded automotive fuel with up to 10% maximum ethanol content meeting ASTM D4814 with minimum RON 95 (minimum Anti-Knock Index 91) Grade 100LL aviation gasoline (AVGAS) meeting ASTM D910
Max Engine Power at SL	100 hp at 5800 RPM (5 min max)
Max Demonstrated Direct Crosswind Component – Land and Water (not a limitation)	12 knots
Service Ceiling at Gross Weight (100 ft/min Climb Rate)	15,000 ft

2.9 APPROVED MANEUVERS

2.9.1 IN FLIGHT:

All aerobatic maneuvers are prohibited. The aircraft is not certified for aerobatics, inverted flight, or sustained zero ‘g’ or negative ‘g’ flight.

Intentional or attempted spins are prohibited.

Prolonged periods in stalled flight are to be avoided.

2.9.2 ON THE WATER:

Low speed taxiing turns on the water while off the step in displacement or plowing modes are approved. Gentle turns while on the step and up to takeoff speeds are also approved.

Aggressive turns while on the step and up to takeoff speeds should be avoided and may induce a water loop. Water loops are not approved and could cause damage to the nose gear doors or Seawings™.

WARNING: Contacting the wing tip with the water while in motion can create a dangerous situation and must be avoided. The planing wing tip design is intended as a safety precaution for inadvertent wing tip water contact and should never be used intentionally or relied upon for safety.

2.10 FUEL LIMITATIONS

Total Fuel Capacity

20.1 US gallons

Total Usable Fuel

20 US gallons

Brand	Description
PRESTONE	DEX-COOL extended life
PRESTONE	50/50 prediluted DEX COOL extended life
SHELL	DEX-COOL
SHELL	Antifreeze Concentrate
TEXACO	Havoline Extended Life Antifreeze
VELVANA FRIDXE	G49
YACCO	LR-35

2.13 ENGINE

One Rotax 912iS Sport, 4-stroke, 4-cylinder horizontally opposed, spark ignition

Maximum Rated Power at Sea Level, Standard Day

100 hp at 5800 RPM

NOTE: Per the Rotax Manual, the engine should only be run at this setting for a maximum of 5 minutes.

Ignition Switch

Operate Starter for a no more than 10 seconds, continuous cranking, followed by a cooling period of 2 minutes before next attempt

Maximum Continuous Power

97 hp at 5500 RPM

Idle Speed

1700 ± 75 RPM (A5 requirement)

2.14 ENVIRONMENTAL LIMITATIONS

Aircraft Temperature Limitations

The design temperature ranges for the aircraft are as follows:
Storage: -40°F and 150°F
Operations in dry conditions: -20°F to ICAO+50°F (109°F at sea level)

Chapter 05

PERFORMANCE

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5.1 SUMMARY OF PERFORMANCE SPECIFICATIONS

Parameter	Value
Gross Weight	1510 lb_f
Top Speed at SL, V_H (MCP, 5500 RPM)	95 KTAS
Cruise Speed, 5000 RPM, 8000 ft	84 KTAS
Range (5000 RPM, 8000 ft, including takeoff and climb from SL)	427 nm (with 45 min reserve)
Best Angle of Climb Speed, V_X (Flaps 0°)	54 KIAS
Best Angle of Climb Speed, V_X (Flaps 15°/30°)	50 KIAS
Best Rate of Climb Speed, V_Y	58 KIAS
Rate of Climb at V_X (SL)	616 ft/min
Rate of Climb at V_Y (SL)	629 ft/min
Stall Speed, V_S (Flaps and landing gear up)	45 KIAS

Full throttle

V_Y – 58 KIAS

Press Alt (ft)	Rate of Climb (ft/min)					
	0°F	20°F	40°F	60°F	80°F	100°F
Sea Level	682	663	646	629	614	598
1000	644	626	609	592	577	562
2000	607	589	571	555	540	525
3000	569	551	534	518	503	488
4000	532	514	497	481	466	451
5000	494	477	460	444	429	415
6000	457	439	423	407	392	377
8000	381	363	346	330	314	300
10000	303	285	268	252	237	223
12000	224	207	191	175	160	146

5.9 CRUISE PERFORMANCE

Conditions

1510 lb_f

Windows installed

		STD Temp - 20°F			STD Temp			STD Temp + 20°F		
Press Alt (ft)	RPM	KTAS	FF[1]	Econ[2]	KTAS	FF[1]	Econ[2]	KTAS	FF[1]	Econ[2]
Sea Level	4000	76	3.54	21.5	75	3.41	22.1	75	3.29	22.8
	5000	86	4.67	18.5	86	4.46	19.3	86	4.27	20.1
	5500	95	8.10	11.8	95	6.92	13.7	95	5.80	16.4
2000	4500	75	3.35	22.4	75	3.22	23.1	74	3.07	24.0
	5000	86	4.37	19.7	86	4.16	20.6	85	3.97	21.4
	5500	95	6.36	14.9	95	5.18	18.3	95	4.92	19.2
4000	4500	74	3.15	23.6	73	2.99	24.6	73	2.84	25.6
	5000	85	4.07	21.0	85	3.87	22.0	85	3.68	23.0
	5500	95	5.05	18.8	94	4.77	19.8	94	4.51	20.9
6000	4500	73	2.91	25.1	72	2.76	26.2	71	2.65	26.9
	5000	85	3.77	22.5	84	3.57	23.6	84	3.41	24.6
	5500	94	4.64	20.3	94	4.36	21.6	94	4.14	22.6

		STD Temp - 20°F			STD Temp			STD Temp + 20°F		
Press Alt (ft)	RPM	KTAS	FF[1]	Econ[2]	KTAS	FF[1]	Econ[2]	KTAS	FF[1]	Econ[2]
8000	4500	72	2.70	26.5	70	2.58	27.3	69	2.53	27.2
	5000	84	3.49	24.1	84	3.32	25.2	93	3.20	26.0
	5500	94	4.26	22.1	94	4.02	23.3	93	3.85	24.3
10000	4500	70	2.56	27.2	68	2.49	27.2	66	2.44	27.0
	5000	83	3.26	25.6	83	3.13	26.5	82	3.00	27.4
	5500	94	3.94	23.8	93	3.76	24.8	93	3.59	25.9
12000	4500	67	2.47	27.1	65	2.41	26.9	63	2.35	26.8
	5000	83	3.07	26.9	82	2.93	27.9	81	2.81	29.0
	5500	93	3.67	25.4	93	3.49	26.6	93	3.32	27.9

1. Fuel Flow (gal/hr)
2. Economy (nm/gal)

5.10 TIME, FUEL, AND DISTANCE TO CLIMB

Conditions

1510 lb_f

Flaps – 0°

Full throttle

V_Y – 58 KIAS

Zero wind

Standard temperature

CHAPTER 5

Corrections

Add 0.2 gallons of fuel for engine start, taxi and takeoff allowance.

Increase time, fuel and distance by 5% for each 20°F above standard temperature.

Press Alt (ft)	STD Temp (°F)	From Sea Level		
		Time (min)	Fuel Used (gal)	Distance (nm)
Sea Level	59	0.0	0.0	0.0
1000	55	1.6	0.2	1.6
2000	52	3.4	0.3	3.3
3000	48	5.2	0.5	5.2

Press Alt (ft)	STD Temp (°F)	From Sea Level		
		Time (min)	Fuel Used (gal)	Distance (nm)
4000	45	7.1	0.6	7.2
5000	41	9.2	0.8	9.4
6000	37	11.5	0.9	11.8
8000	30	16.6	1.3	17.3
10000	23	22.9	1.6	24.3
12000	16	31.1	2.1	33.7

5.11 RANGE AND ENDURANCE

Conditions

1510 lb_f and Forward CG

Flaps – 0°

Landing gear – UP

Windows installed

Zero wind

Includes 0.2 gal for engine start, taxi, and takeoff.

Includes fuel and distance to climb to the given altitude.

Includes 45 minutes fuel reserve at 4500 RPM at the given altitude.

		STD Temp - 20°F			STD Temp			STD Temp + 20°F		
Press Alt (ft)	RPM	KTAS	Endurance (hrs)	Range (nm)	KTAS	Endurance (hrs)	Range (nm)	KTAS	Endurance (hrs)	Range (nm)
Sea Level	4500	76	4.8	369	75	5.1	381	75	5.3	394
	5000	86	3.7	317	86	3.9	332	86	4.1	348
	5500	95	2.1	202	95	2.5	237	95	3.0	284
2000	4500	75	5.1	384	75	5.3	398	74	5.6	417
	5000	86	3.9	337	86	4.1	354	85	4.3	372
	5500	95	2.7	257	95	3.3	316	95	3.5	334
4000	4500	74	5.3	403	73	5.7	424	73	6.0	444
	5000	85	4.1	360	85	4.4	379	85	4.6	400
	5500	95	3.3	322	94	3.6	343	94	3.8	364
6000	4500	73	5.7	429	72	6.1	453	71	6.4	466
	5000	85	4.4	386	84	4.7	408	84	4.9	427
	5500	94	3.6	350	94	3.8	374	94	4.1	395

and the push-to-talk buttons on both the pilot and passenger control sticks. The antenna with VHF radio is located on top of the horizontal tail of the aircraft. For more details on operating the TY91 and TC90, see Trig Avionics Limited Publication 00839-00-AF (TY91 and TY92 VHF Radio Installation Manual).

The TT21, also supplied by Trig Avionics, is a remote mounted Mode S transponder, installed inside the left side of the nose of the aircraft next to the VHF radio, and is controlled through a TC20 controller unit, located in the center stack console. The antenna for the transponder is located on top of the engine cowling. For more details on operating the TT21 and TC20, see Trig Avionics Limited Publication 00559-00-AF (TT21 and TT22 Mode S Transponder Operating Manual).

The ELT, supplied by ACK Technologies, is installed below the center console and sends out a distress signal when manually or automatically activated. The ELT can be manually activated through the remote control located on the left-hand side of the overhead console. The antenna for ELT is located on the engine cowling aft of the transponder antenna.

7.8 ENGINE

The A5 is powered by a Rotax 912iS Sport fuel injected 4-cylinder engine, rated at 100 hp (73.5 kW) at 5800 RPM. The 912iS is based on the proven 912 ULS engine with significant upgrades to improve performance and reliability. It is equipped with an electric starter, dual-redundant ignition system, and a fully digital Engine Control Unit (ECU) that automatically adjusts fuel/air mixture throughout flight to maintain optimal performance, efficiency and low emissions, thereby reducing fuel consumption and overall operating costs. The ECU also obviates the need for a carburetor and associated mixture controls in the cockpit, making operation of the engine fully automatic for the pilot and eliminating the threat of carburetor icing. The 912iS Sport is both liquid cooled (cylinders heads) and air-cooled (cylinders) with a dry sump forced lubrication system and separate oil tank. It can run on either Aviation Gasoline (AVGAS), motor gasoline (MOGAS), or a combination of both. Engine cooling on the A5 is augmented by a fan located on the propeller shaft ahead of the spinner. Best cooling on the ground is achieved with engine set from 3000 to 4000 RPM.

Commanded throttle position is sensed and transmitted to the ECU as a pilot request for specific power output. This signal is then combined with environmental inputs to provide the commanded response. The interface is simple and seamless for the pilot, automating the process of adjusting fuel/air mixture and ensuring optimal performance. Move the throttle and the engine does the rest.

Engine power is displayed as RPM on the tachometer gauge on the right lower flight instrument cluster. Fuel flow is directly proportional to this RPM, although actual power output and useful thrust delivered is a function of both RPM and aircraft density altitude. Normal operating range is from 1700 to 5500 RPM with a redline of 5800 RPM.

7.9 PROPELLER

The A5 uses a Sensenich, 3-blade propeller. The blade construction is hollow carbon fiber and fiberglass with UV protection. The blade leading edges are equipped with metal erosion shields. The two-piece hub is made from anodized aluminum.

NOTE: Although the propeller is ground adjustable, ICON does not permit propeller pitch adjustments.

7.10 ELECTRICAL SYSTEM

The electrical system on the A5 is powered by the Rotax 912iS Sport engine's integrated internal alternator, charging a 12VDC, 24Ah battery located in the nose of the aircraft. The alternator has two isolated coils, creating a redundant charging system (a 16 amp alternator A and a 30 amp alternator B). The engine voltage regulation is performed by two three-phase short rectifier regulators located on the Rotax-supplied fuse box. The output voltage of each regulator is 14.2 V ± 0.3.

During engine startup, the engine management system (EMS) is powered by the battery. With sufficient speed, (2500 RPM) alternator B takes over this function. After the EMS system check, alternator A takes over the supply of the EMS system (engine), if the switching threshold is exceeded. Alternator B is then used to charge the battery and to power the aircraft systems, including all avionics and instruments, exterior and interior lights, landing gear, water

rudder, flaps, pitch trim, bilge pump, cabin heat, master solenoid, two USB outlets and a 12 VDC outlet. The outlets are located in the center console under the armrest and have a maximum current draw of 4.6A combined. Alternator B also powers the relay panel, which is located aft of the baggage compartment on the RH side and controls the logic for several of the systems listed above. Both the battery and alternator B share the same electric bus.

7.11 EXTERIOR LIGHTING

The A5 has navigation and strobe lights on each wing tip. In the nose of the aircraft, there are narrow-beam, high-intensity landing lights as well as a wide-angle, low-intensity light for taxiing. All of the lights are controlled by switches on the center console. The aft wing tip strobe and white navigation lights have two fences installed on the inboard and outboard edges of the light housing.

7.12 SEAT BELTS AND SHOULDER HARNESSES

Both seat positions are equipped with retractable three-point integrated seat belt/shoulder harnesses with inertia reels.

To use the seat belts/shoulder harness, position the adjustable metal link on the harness at about shoulder level, pull the link and harness downward, and insert the link into the lower seat belt buckle. Adjust belt tension across the lap by pulling upward on the shoulder harness. Release the belt by pressing inward on the red release button, which will allow the inertia reels to pull the harness back into the retracted position.

7.13 FUEL SYSTEM

Fuel is contained in a single 20-gallon tank located under the baggage floor behind the seats. The fuel quantity indicating system uses an auto-calibrating float-type fuel level sensor that is accurate to within one gallon in coordinated, straight and level, unaccelerated flight. A separate optical fuel low level sensing system will activate a red LED warning light on the fuel quantity gauge when less than two gallons of fuel remain.

A fuel filler cap is located on the left side of the fuselage exterior, just aft of the cockpit. There is small tube within the fuel filler neck

that allows fuel to be drawn up from the sump at the bottom of the tank for removal of contaminants and inspection.

A fuel shutoff valve is located in the overhead console. The valve is normally left open, but can be closed during certain emergency situations. Two electric fuel pumps, one powered and controlled by each lane (A & B) of the Engine Management System (EMS) provide redundant positive-pressure fuel flow from the tank to the 912iS engine. A fuel quantity gauge calibrated from 0 to 20 gallons is mounted on the lower left portion of the secondary instrument cluster.

NOTE: Do not run the electric boost pumps (i.e. do not turn the ignition key) with the fuel shutoff valve in the closed position or pump damage could result.

Fuel feeds by gravity to the bottom of the fuel tank where the sump and fuel pickup for the engine are located. The fuel tank is shaped to minimize the amount of unusable fuel throughout the range of normal aircraft attitudes and accelerations. Fuel delivery to the engine will be interrupted if the fuel moves away from the sump as could happen in negative-g flight or in extreme attitudes. For this reason, extreme attitudes and lateral accelerations must be avoided. In addition, climbs slower than V_Y (58 KIAS) and intentional side slips are prohibited with less than 2 gallons of fuel (low-level light illuminated).

WARNING: Do not climb slower than V_Y or perform intentional sideslips with a fuel level of less than two gallons (low-level light illuminated). Doing so could cause the engine to stop, resulting in a dangerous situation.

7.14 CANOPY

The A5 features a large, forward-tilting canopy. The canopy latches at the top-center from either outside or inside. The canopy is supported by a gas spring, which assists with opening the canopy and holds it fully open. A detent is located in the motion of the canopy that serves to hold it slightly open for improved ventilation when needed while not in flight.