Rans S6-6ES

Pilot Operating Handbook

Section 1 : 3 View drawing of S-6ES Coyote II

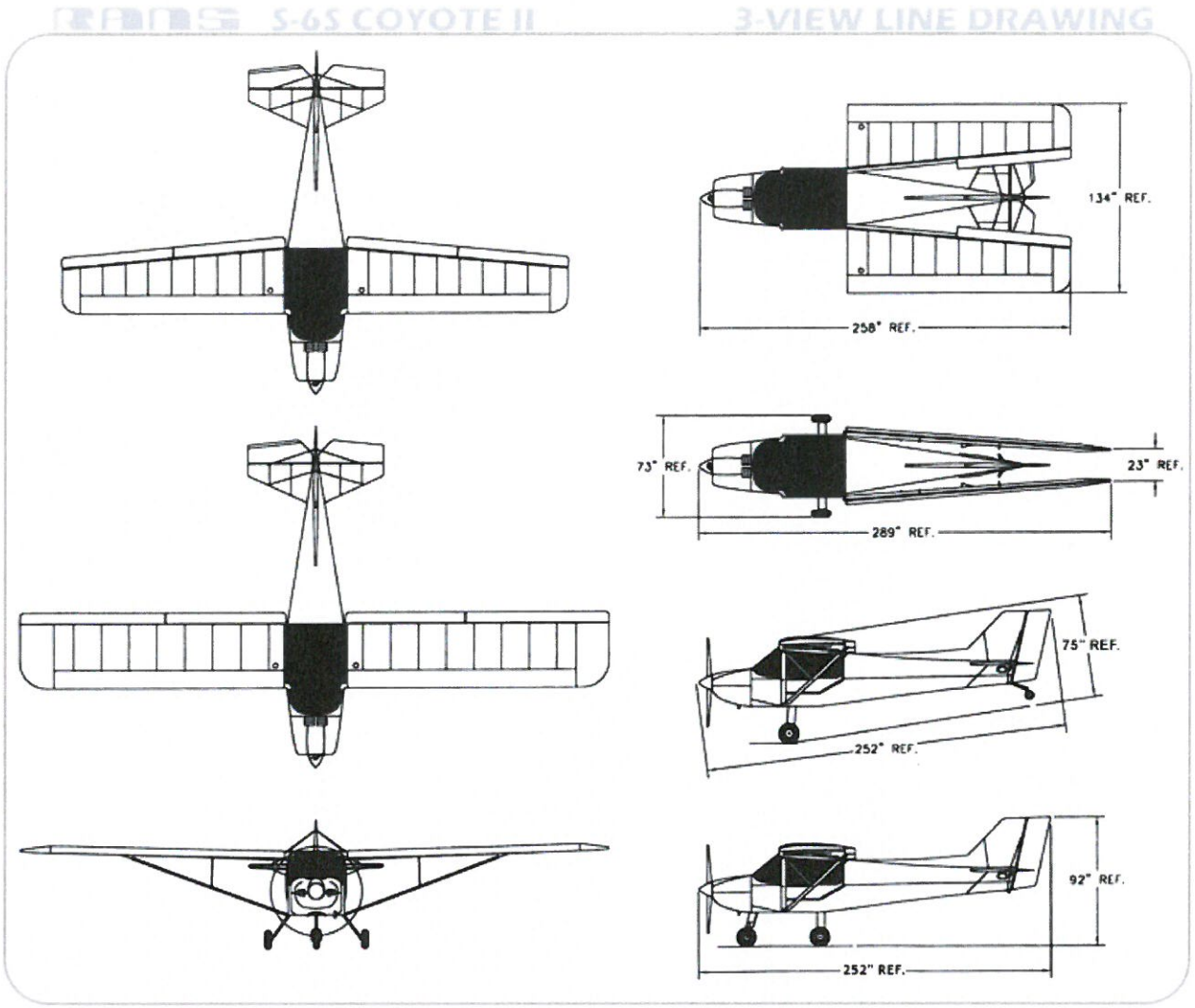

Figure 1-1

INTRODUCTION

This handbook is not designed as a substitute for proper flight instruction or knowledge of current airworthiness directives, federal air regulations, or advisory circular. This handbook should not be used for operational purposes unless it is kept current. The pilot should study the entire handbook to familiarize himself with the limitations, performance, procedures, and handling characteristics of the airplane prior to flight.

Assurance that the airplane is in airworthy condition is the responsibility of the owner. The pilot in command is responsible for determining that the aircraft is safe for flight. The pilot is also responsible for operating the aircraft within the limitations set forth in this handbook and displayed by the instrument markings and placards.

DESCRIPTIVE DATA

ENGINE:

Number of Engines 1
Engine Manufacturer ..... Rotax
Engine Model Number 912ULS
Engine Type: Normally aspirated, water cooled, horizontally opposed, carburetor equipped, four-cylinder engine with 73.9 in displacement.

Horsepower and Engine Rotational Speed:

Maximum Takeoff (Max allowable 3 min) ..... 5800 RPM
Maximum Continuous 78 bhp (59 kw) ..... 5500 RPM
Idle speed (aprox.) ..... 1400 RPM

PROPELLER:

Number of Propellers 1
Propeller Manufacturer ..... Tennessee propellers
Propeller Model Numbe 6656RH
Propeller Diameter ..... 1676 mm
Propeller Type ..... 2 blade, 56 in wood Fixed Pitch

FUEL:

Fuel Grade: ..... Premium grade gasoline 91 octane or AVGAS 100LL (blue)
Total Capacity ..... 68 l

CAUTION
Due to higher lead content in avgas, the wear of the valve seats in the combustion chamber will increase. Therefore, use avgas only if you encounter problems with vapor lock of if mogas is not available.

OIL

Total Oil Capacity 3l
Oil Grade ..... Automotive engine oil with API, SF or SG classification
Viscosity Recommendations: ..... -22 F TO +77 F–SAE 5W-50 | +77 F TO +104 F–SAE 40

CAUTION
Do not use aircraft engine oil.

MAXIMUM WEIGHTS

Maximum Takeoff Weight ..... 545 kg
Maximum Landing Weight ..... 545 kg
Maximum Weight in baggage Compartment ..... 22 kg
Maximum Weight in aircraft baggage Compartment ..... 13 kg

TYPICAL AIRPLANE WEIGHTS

Standard Empty Weight ..... 272 kg
Maximum Useful Load ..... 272 kg

COCKPIT DIMENSIONS

Width (Maximum) ..... 104 cm
Length (Rudders pedals to Seat Back) ..... 106 cm
Height (Maximum) ..... 94 cm

BAGGAGE SPACE

Inside cabin: ..... Compartment Volume 600 mm
Maximum width ..... 950 mm
Maximum Length ..... 230 mm
Maximum Depth ..... 250 mm
Tail cone: ..... Compartment Volume 190 mm
Maximum width ..... 860 mm
Maximum Height ..... 710 mm
Maximum Depth ..... 310 mm

SPECIFIC LOADINGS

At Maximum Takeoff Weight: ..... Wing Loading: 7.29 lbs/ft
Power Loading: ..... 15.38 lbs/hp

SYMBOLS, ABBREVIATIONS, AND TERMINOLOGY

The following definitions are of symbols, abbreviations, and terminology used in this handbook and those which may be of operational significance to the pilot:

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

CAS
Calibrated Airspeed means the indicated peed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.

KCAS
Calibrated Airspeed expressed in "knots".

GS
Ground speed is the speed of an airplane relative to the ground.

IAS
Indicated Airspeed is the speed of an aircraft as shown in the airspeed indicator when corrected for instrument error. IAS values published in this Manual assume zero instrument error.

KIAS
Indicated Airspeed expressed in "knots".

TAS
True airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature, and compressibility.

VA
Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.

VFE
Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.

VNE
Never Exceed Speed is the speed limit that must not be exceeded at any time.

VNO
Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution.

VS
Stalling speed or the minimum steady flight speed at which the airplane is controllable.

VSO
Stalling speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration.

VX
Best Angle-Of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.

VY
Best Rate-Of-Climb is the airspeed which delivers the greatest gain in the altitude in the shortest possible time.

METEOROLOGICAL TERMINOLOGY

ISA
International Standard Atmosphere in which:

The air is a dry perfect gas;

The temperature at sea level is 15° Celsius;

The pressure at sea level is 1013.2 mb;

The temperature gradient from sea level to the altitude at which the temperature is approximately -2 C for each 305m (1000 feet) of altitude.

OAT
Outside Air Temperature is the free air static temperature, obtained either from in flight temperature indications or ground meteorological sources, adjusted for instrument error and compressibility effects.

Indicated Pressure Altitude
The number actually read from an altimeter when the pressure barometric sub-scale has been set to 1013.2milibars.

Pressure Altitude
Altitude measured from standard sea-level pressure 1013.2 milibars by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this handbook, altimeter instrument errors are assumed to be zero.

Station Pressure
Actual atmospheric pressure at field elevation.

Wind
The wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported winds.

POWER TERMINOLOGY

Takeoff Power
Maximum power permissible for takeoff.

Maximum Continuous Power
Maximum power permissible continuously during flight.

Maximum Climb Power
Maximum power permissible during climb.

Maximum Cruise Power
Maximum power permissible during cruise.

BHP

Brake Horsepower is the power developed by the engine. Percent power values in this handbook are based on the maximum continuous power rating.

RPM
Revolutions Per Minute is the engine speed.

ENGINE CONTROLS AND INSTRUMENTS TERMINOLOGY

Throttle Control
Used to control power by introducing fuel air mixture into the intake passages of the engine.

Tachometer
Indicates the RPM of the engine/propeller.

EGT Gauge
Exhaust Gas Temperature Gauge.

CHT
Cylinder Head Temperature.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient
The demonstrated ratio of the change in height during a portion of a climb, to the horizontal distance traversed in the same time interval.

Demonstrated Crosswind Velocity
The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during flight tests.

WEIGHT AND BALANCE TERMINOLOGY

Reference Datum
An imaginary vertical plane from which all horizontal distances are measured for balance purposes.

Station
A location along the airplane fuselage usually given in terms of distance from the reference datum.

Arm
The horizontal distance from the reference datum to the center of gravity (CG) of an item.

Moment
The product of the weight of an item multiplied by its arm. (Moment divided by a constant is used to simplify balance calculations by reducing the number of digits).

Center Gravity (CG)
The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

C.G. Arm
The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.

C.G. Limits
The extreme center of gravity locations which indicate limits within which the aircraft must be operated at a given weight.

Usable Fuel
Fuel available for flight planning.

Unusable Fuel
Fuel remaining after a runout test has been completed.

Standard Empty Weight
Weight of a standard airplane including unusable fuel, full operating fluids and full oil.

Basic Empty Weight
Standard empty weight plus optional equipment.

Payload
Weight of occupants, cargo and baggage.

Useful Load
Difference between takeoff weight and basic empty weight.

Maximum Takeoff Weight
Maximum weight approved for the start of the takeoff run.

Maximum Landing Weight
Maximum weight approved for the landing touchdown.

Tare
The weight of chocks, blocks, stands, etc., used on the scales when weighing an airplane.

SECTION 2 : Limitations

GENERAL

The limitations provided in this section include operating limitations, instrument markings, color codings and required placards. This airplane must be operated in compliance with the operating limitations stated in this handbook and those associated with the required placards and markings.

AIR SPEED LIMITATIONS

Speed	IAS	Remarks
V_A Mauvering Speed	150 km/h	Do not make full or abrupt control movements above this speed
V_{FE} Maximum Flap Extension Speed (15 – 30 deg)	105 km/h	Do not exceed this speed with a given flap setting. (15 - 30 Flaps)
V_{NO} Maximum structural cruising speed	170 km/h	Do not exceed this speed except in smooth air and then only with caution.
V_{NE} Never exceed speed	193 km/h	Do not exceed this speed in any operation.

CAUTION
Maneuvering speed should not be exceeded while operating in rough air.

AIRSPEED INDICATOR MARKINGS

Marking	Ias value/range (km/h)	Significance
White arc	65 – 105	Full flap operating range. Lower limit is maximum weight stalling speed in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green arc	70 - 170	Normal Operating Range. Lower limit is maximum weight stalling speed. Upper limit is maximum structural cruising speed
Yellow arc	170 – 193	Operations must be conducted with caution and only in smooth air.
Red line	193	Maximum speed for all operations.

Figure 2-2–Airspeed Indicator Markings

POWER PLANT LIMITATIONS

Number of engines 1
Engine Manufacturer ..... Rotax
Engine Model Number 912ULS

Engine Operating Limits

Maximum Horsepower 78
Maximum Rotational Speed (RPM)(Max. 3 Minutes) 5800
Maximum Oil Temperature ..... 140° C
Minimum Oil Pressure ..... 4,00 Bar
Maximum Oil Pressure ..... 5,00 Bar
Minimum Fuel Pressure ..... 0,15 Bar
Maximum Fuel Pressure ..... 0,40 Bar
Maximum Coolant Pressure ..... 1,17 Bar
Maximum Cylinder Head Temperature ..... 150° C

Fuel Grade (MOGAS ONLY)

Minimum Octane ..... 92 octane

Oil Grade (Automotive Engine Oil Only)

Below +25° C ..... SAE 5W-50
Above +25°C ..... SAE 40

Number of Propellers 1
Propeller Manufacturer ..... Tennessee Propeller
Propeller Model ..... 6656 RH
Propeller Diameter ..... 1.68 m

Propeller Operating Limits

Rotational speed restriction ..... 5800 RPM

Instrument	Red line - Min limit	Green Arc - Normal	Red Line - Max limit
Tachometer (RPM)	--	1400-5500	5800
Coolant Press (Bar)	--	0,55 - 1,1	17
Coolant Temp.	49° C	66-93° C	104° C
Fuel Press (Bar)	--	0,15 - 0,55	0,55
Oil Press (Bar)	1,5	2 - 3,8	5,5
Oil Temp	49° C	88-110° C	140°C
Cylinder Head Temp	--	93-132° C	149° C

WEIGHTS

Maximum Weight ..... 544 Kg
Maximum Baggage at Fuselage Station–229 cm ..... 23 Kg
Maximum Baggage at Fuselage Station–267 cm ..... 14 Kg

CENTER OF GRAVITY LIMITS

Forward limit ..... 162.6 cm
Rearward limit ..... 185 cm

The datum used is the face of the propeller flange. Leveling point is at the bottom of the

door in the cockpit cage.

CAUTION
It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 5 (Weight and Balance) for proper loading instructions.

Maneuvering limits

maneuvering Speed: ..... (VA) 150 IAS (km/h)

Flight load factor limits

flight Load Factors

Flaps Up ..... + 3.8 g -1.9 g
Flaps Down ..... + 2.0 g

Fuel limitations

Total Capacity ..... 68 litres
Usable Fuel..... 66 litres
Fuel grade (MOGAS Minimum octane) 91 Octane

CAUTION
Fuel remaining when quantity indicator reads zero can not be used safely in flight

Placards

Except as may be otherwise indicated on a placard, the markings and placards installed in the airplane contain operating limitations which must be complied with.

In full view of the pilot:
- EXPERIMENTAL
- PASSENGER WARNING
  THIS AIRCRAFT IS AMATEUR BUILT AND DOES NOT COMPLY
  WITH THE FEDERAL SAFETY REGULATIONS FOR STANDARD AIRCRAFT
- DO NOT OPEN DOOR ABOVE 65 MPH
- SECURE ALL LOOSE OBJECTS BEFORE FLIGHT
- DRAIN GASCOLATOR BEFORE FLIGHT

On the inside of the baggage compartment door (for the optional AFT. baggage cpt.)
- MAXIMUM BAGGAGE 13 kg

On the instrument panel (for the cabin baggage compartment.)
- MAXIMUM BAGGAGE 22 kg

Adjacent to fuel filler caps. (2 Places)
- FUEL CAPACITY 9 GAL. US–91 OCTANE MINIMUM

SECTION 3 : Normal procedures

AIRSPEEDS FOR NORMAL OPERATIONS

Unless otherwise noted, the following speeds are based on a maximum weight of 500 kg and may be used for any lesser weight.

Best Rate of Climb Speed (Vy) ..... 120 Km/h
Best Angle of Climb Speed (VX) ..... 90 Km/h

Approach Speed :

Flaps UP ..... 90 Km/h
Full Flaps DOWN ..... 80 Km/h
Rotation Speeds ..... 56 Km/h
Maximum Demonstrated Crosswind Velocity ..... 32 Km/h
Maximum Flap Speed ..... 105 Km/h

NORMAL PROCEDURES CHECKLIST

Preparation

Airplane Status ..... AIRWORTHY PAPERS ON BOARD
Pilot's Operating Handbook ..... AVAILABLE
Weather ..... SUITABLE
Baggage ..... WEIGHED, STOWED, TIED
Weight and C.G ..... WITHIN LIMITS
Navigation ..... PLANNED
Charts and navigational equipment ..... ON BOARD
Performance and range ..... COMPUTED AND SAFE

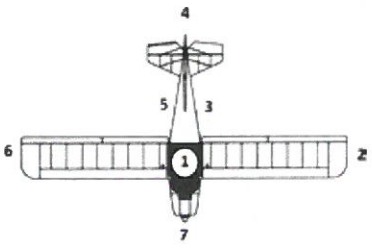

Figure 3 – 1

PREFLIGHT INSPECTION CHECKLIST:

(Refer to Figure 3 -1)

1. COCKPIT

Flight Controls ..... REMOVE RESTRAINTS
Ignition Switch ..... OFF
Primary Flight Controls ..... CHECK
Flaps ..... CHECK AND UP
Fuel valve ..... ON
Passenger Seat Belts and Harness ..... CHECKED
Windshield & doors ..... CHECK, CLEAN
Baggage ..... SECURE
Fuel Tank ..... VISUALLY CHECK SUPPLY
Seats ..... ADJUST AS NEEDED

2. LEFT WING

Wing &Control Surfaces ..... FREE OF DAMAGE, ICE, SNOW OR FROST
Flaps and Hinges ..... CHECK FOR INTERFERENCE
Ailerons and Hinges ..... CHECK FOR INTERFERENCE

Wing root connection

pins and bolts in place ..... CHECK
Lift strut bolts/pins secure ..... CHECK
Jury strut/connections ..... CHECK
Fabric ..... CHECK FOR TEARS
Wing Tip & Lights ..... CHECK
Pitot and static probes ..... CLEAR
Tie Down and Chock ..... REMOVE
Tire and Wheel ..... CHECK
Brake Assembly and Brake Line ..... CHECK
Fuel filler cap ..... SECURE

Before first flight of the day and after each fueling, use sampler cup and drain small quantity of fuel from tank sump quick-drain valve to check for water sediment and proper fuel grade (color).

3. FUSELAGE (LEFT SIDE)

General Condition ..... CHECK
Fabric ..... CHECK FOR TEARS
Tubes ..... NO BEND

4. EMPENNAGE

General Condition ..... FREE OF DAMAGE, ICE, SNOW OR FROST
Elevator & Trim Tab ..... FREE OF INTERFERENCE
Rudder ..... FREE OF INTERFERENCE
Tie Down ..... REMOVE

5. FUSELAGE (RIGHT SIDE)

General Condition ..... CHECK
Antennas ..... CHECK
Fabric ..... CHECK FOR TEARS
Tubes ..... NO BENDS OR DENTS

6. RIGHT WING

Wing & Control Surfaces ..... FREE OF DAMAGE, ICE, SNOW OR FROST
Ailerons and Hinges ..... CHECK FOR INTERFERENCE
Flaps and Hinges ..... CHECK FOR INTERFERENCE

Wing root connection

pins and bolts in place ..... CHECK
Lift strut bolts/pins secure ..... CHECK
Jury strut/connections ..... CHECK
Fabric ..... CHECK FOR TEARS
Wing Tip & Lights ..... CHECK
Tie Down and Chock ..... REMOVE
Tire and Wheel ..... CHECK WEAR AND INFLATION
Brake Assembly / Brake Line ..... CHECK FOR LEAKS
Fuel filler cap ..... SECURE

Before first flight of the day and after each fueling, use sampler cup and drain small quantity of fuel from tank sump quick-drain valve to check for water sediment and proper fuel grade (color).

7. NOSE SECTION

Engine Compartment ..... CHECK FOR LEAKS
Oil ..... CHECK FOR QUANTITY
Dipstick and Oil Cap ..... SECURE
Engine mount structure free of cracks ..... CHECK
Gear reduction system/Gear box ..... NO OIL LEAKS
Air filter ..... CLEAN AND SECURE
Spark plug wire ..... CHECK
Carburetor position and clamp tightness ..... CHECK
Coolant level ..... CHECK
Muffler spring tension ..... CHECK
Muffler free of cracks ..... CHECK
Cowling ..... CLOSED AND SECURED
Propeller ..... SECURE, FREE OF NICKS
Spinner ..... SECURE
Air Inlets ..... CLEAR
Gear/Tire and Wheel ..... CHECK

BEFORE ENGINE STARTING:

Preflight Inspection ..... COMPLETE
Seat Belts and Harnesses ..... FASTENED
Brakes ..... APPLY
Switches ..... OFF
Circuit Breakers ..... IN
Radios ..... OFF
Cockpit Lighting ..... CHECK
Nav. & Strobe Lights ..... CHECK
All Switches ..... OFF
Fuel Valve ..... ON

STARTING ENGINE WHEN COLD

Brakes ..... APPLY
Throttle ..... SET
Propeller Area ..... CLEAR
Starter ..... ENGAGE
Throttle ..... ADJUST
Oil Pressure ..... CHECK
Coolant Pressure ..... CHECK
If engine does not start within 10 seconds, prime and repeat starting procedure.

STARTING ENGINE WHEN HOT

Throttle ..... SET
Brakes ..... APPLY
Propeller Area ..... CLEAR
Starter ..... ENGAGE
Throttle ..... ADVANCE
Oil Pressure ..... CHECK
Coolant Pressure ..... CHECK

WARM-UP

Throttle ..... 1800 to 2500 RPM

BEFORE TAXIING

Seat Belts & Harnesses ..... FASTENED, CHECK
Avionics ..... ON, AS REQUIRED
Lights ..... AS REQUIRED
Taxi Area ..... CLEAR

TAXIING

Throttle ..... APPLY SLOWLY
Brakes ..... CHECK
Nosewheel Steering ..... CHECK
Compass ..... CHECK

BEFORE TAKEOFF

Brakes ..... APPLY
Fuel Valve ..... ON
Throttle ..... 3000 RPM
Magnetos ..... CHECK BOTH, MAX. DROP 200 RPM
Engine Instruments ..... CHECK
Throttle ..... IDLE
Avionics ..... CHECKED & SET
Flight Instruments ..... CHECKED & SET
Flaps ..... CHECK, THEN UP
Flight Controls ..... FREE & CORRECT
Seat Belts & Harnesses ..... FASTENED, CHECK
Engine is warm for takeoff when throttle can be opened without engine faltering.
Allow a minimum of 2 minutes for warm-up.

TAKE OFF-NORMAL

Brakes ..... RELEASE
Flaps ..... UP
Engine Instruments ..... CHECK
Throttle ..... FULL THROTTLE

Right Rudder ..... AS NEEDED
Airspeed ..... ROTATE AT 55 MPH - ACCELERATE TO 75 MPH, THEN CLIMB OUT

SHORT FIELD, OBSTACLE CLEARANCE TAKEOFF

Wing Flaps ..... DOWN 2 NOTCHES
Brakes ..... APPLY
Throttle ..... FULL THROTTLE
Brakes ..... RELEASE
Airspeed ..... ACCELERATE TO 72 km/h
Right rudder ..... AS NEEDED
Stick ..... APPLY SLIGHT BACK PRESSURE
After lift-off accelerate just above the ground to 40 MPH and climb past obstacle height. Continue climbing while accelerating to 55 MPH. Slowly remove flaps.

CLIMB

Throttle ..... FULL THROTTLE
Flaps ..... UP (SLOWLY RETURN)
Engine Instruments ..... MONITOR
Airspeeds (IAS) ..... 120 km/h IAS

CRUISE

Throttle ..... 4800 RPM
Trim Tab ..... ADJUST
Engine Instruments ..... MONITOR

DESCENT, NORMAL

Seat Belts and Harnesses ..... FASTENED
Altimeter ..... SET
Throttle ..... 4000 RPM
Airspeed ..... 120 km/h

APPROACH AND LANDING

Airspeed ..... TRIM TO 65 MPH
Flaps ..... UP
Final Approach Speed ..... 75 km/h

BALKED LANDING

Throttle ..... FULL THROTTLE
Flaps ..... UP
Airspeed ..... UNTIL CLEAR OF OBSTACLES: 80 km/h

AFTER LANDING

Flaps ..... UP
Trim Tab ..... RETURN FOR TAKEOFF

SHUTDOWN

Brakes ..... APPLY
Electrical & Avionics ..... OFF
Throttle ..... IDLE
Ignition ..... OFF
Brakes ..... RELEASE
Chocks and Tie Downs ..... INSTALL

SECTION 4 : Performances - Model S-6S - Rotax 912

NOTE
The performance numbers presented in this section are measured from factory built aircraft. Your aircraft performance may vary.

Stall speeds:

Weight	Flap position	Bank angle			
		0	30	45	60
		INDICATED AIRSPEED			
		Km/h	Km/h	Km/h	Km/h
1200 LBS	Up	63	67	75	89
	1st notch	61	66	73	86
	2nd notch	58	62	69	82
	3rd notch	56	61	67	80

Measured values:

Weight	Flap position	Bank angle			
		0	30	45	60
		INDICATED AIRSPEED			
		Km/h	Km/h	Km/h	Km/h
1200 LBS	Up				
	1St notch				
	2nd notch				
	3rd notch				

NOTES:
Maximum altitude loss during stall recovery is approximately 75 ft – IAS values are approximate

RATE OF CLIMB

Weight	PRESS ALT. FT / M	Climb speed (IAS) Km/h	Rate of climb - Feet/ Min
544 Kg	Sea Level	120	1000 Ft / 304 m
	2000 Ft / 610 m	120	850 Ft / 259 m
	4000 Ft / 1220 m	120	700 Ft / 213 m
	6000 Ft / 1830 m	120	550 Ft / 168 m
	8000 Ft / 2440 m	120	400 Ft / 121 m

Measured values:

Weight	PRESS ALT. FT	Climb speed (IAS) MPH	Rate of climb - Feet/ Min
544 Kg	Sea Level		
	2000		
	4000		
	6000		
	8000		

Notes: Full throttle, flaps up, standard conditions. No instrument error correction

CRUISE PERFORMANCE

PRESSURE ALT.	RPM	Ias (Km/h)	Fuel Cons (l/h)
2000	5500	161	19
4000	5500	157	19
6000	5500	153	19
8000	5500	149	19
10,000	5500	145	19

Measured values:

PRESSURE ALT.	RPM	Ias (Km/h)	Fuel Cons (l/h)
2000	5500		
4000	5500		
6000	5500		
8000	5500		
10,000	5500		

TAKEOFF DISTANCE

Weight	Pressure Altitude	Ground roll	To clear 15 m obstacle
544 kg	Sea level	44 m	140 m

Measured values:

Weight	Pressure Altitude	Ground roll - (m)	To clear 15 m obstacle

Notes:
decrease distance 10% for each 10 mph (17 Km/h) headwind
Increase distance by 10% for each 3 mph (4 Km/h) tailwind
For dry grass runway increase ground roll distance by 15% - Power 100%

LANDING DISTANCE

Weight	Pressure Altitude	To clear 15 m obstacle	Ground roll
544 kg	Sea level	236 m	61 m

Measured values:

Weight	Pressure Altitude	To clear 15 m obstacle	Ground roll

Notes:
Decrease distance 10% for each 10 mph (17 Km/h) headwind
Increase distance by 10% for each 3 mph (4 Km/h) tailwind
For dry grass runway increase ground roll distance by 15%

SECTION 5 : Weight and balance

GENERAL

In order to obtain the proper performance and flight characteristics, it is essential that the aircraft be flown within the approved gross weight and center of gravity (C.G.) envelope. It is possible to load the aircraft beyond its weight C.G. limitations. Operating outside the envelope will adversely affect flight characteristics. Hazardous operation can result. It is the pilot's responsibility to ensure that the airplane is loaded within the envelope prior to takeoff.

If the C.G. is too far forward, it will be difficult to rotate for takeoff or landing. Too far aft, the airplane will rotate prematurely on takeoff or tend to pitch up during climb. This can lead to unintentional stalls or spins. Spin recovery becomes more difficult with the C.G. aft of the approved limits.

Because of production tolerances and/or optional equipment installed. A weight and balance must be performed. Using the empty weight and the C.G. location, the C.G. for the loaded airplane determined.

The empty weight and C.G. location should be entered in the Maintenance Log. Re-calculate C.G. whenever new equipment or modifications are added.

AIRPLANE WEIGHING PROCEDURES

1. Preparation.

a. Place the airplane in a closed building to eliminate error due to wind.
b. Inflate the tires to recommended pressure.
c. Drain all fuel from the airplane.

CAUTION
It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 5 (Weight and Balance) for proper loading instructions.

If the fuel system is drained in this manner, the engine should be run for at least 3 minutes at 1400-1600 RPM for the Rotax 912 and at 2000-2200 RPM for the Rotax 503 and 582 engines after re-fueling to ensure that there is no air in the fuel lines before the aircraft is returned to service

d. Service engine oil as required to obtain a normal full indication (912 engine only).
e. Remove all dirt, moisture and foreign objects such as tools from the airplane.
f. Raise flaps to fully retracted position.
g. Place all control surfaces in neutral position.

2. Leveling:

a. Place 24" carpenter level at door frame bottom
b. Place scales under each wheel.
c. Lower or raise the nose until level.

3. Weighing:

a. Record the weight shown on each scale.
b. Subtract the tare from the weight to find the net weight.

4. C.G. Location:

a. Using weights from item 3 fill out Fig 5.2 or 5.3, depending on the gear configuration, following the example calculations to determine the empty aircraft C.G location.

Use table 5.1 to keep the aircraft empty C.G. up to date when adding or removing equipment or major repairs as shown in the example.

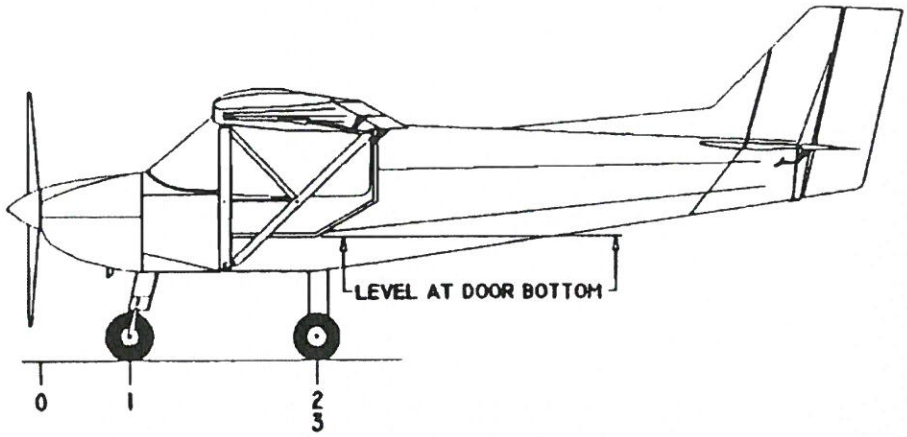

Fig 5.1 – Example only

CAUTION
Acceptable CG 158,8 cm to 185 cm from datum 0,0 for loaded aircraft.
Datum : face of the prop flange

Item	Weight	Arm	Moment
1. Nose gear	95 kg	66 cm	62,70
2. Main gear right	97 kg	198 cm	192,06
3. Main gear left	99 kg	198 cm	196,02
Total =	291 kg	**Total =**	450,78

Aircraft model: S-6ES coyote II			Serial number:							Page n°: 1	
Date	Item no.		Description of article or modification	Weight change						Running Empty weight	
				Added (+)			Removed (-)				
	In	Out		Wt (kg)	Arm (cm)	Moment /1000	Wt (kg)	Arm (cm)	Moment / 1000	W (kg)	Moment /1000

Figure 5.4 – Weight and Balance record

AIRCRAFT LOADING

Determing the loaded aircraft C.G.

Enter the aircraft empty weight, arm and moment (Fig. 5.5.)

Enter the pilot, passenger, fuel (aux. if applicable) and baggage weights multiply the weight by arms and enter moments.

Add up the weight column and enter the total.

Add up the moment column and enter the total.

Find the Center of Gravity using the formula provided.

If the C.G. falls within the acceptable C.G. range then the aircraft is loaded correctly. If not rearrange the weight and repeat steps 1 through 6.

Datum = face of the prop flange

Your aircraft weight and balance

Item	Weight	Arm	Moment
Total =		**Total =**	

FIG 5.5–Loading Schedule

NOTE 1: FUEL WEIGHT @ 0,75 kg/litre
NOTE 2: SEE EXAMPLE AT THE END OF THIS SECTION

SECTION 6

FLYING THE S-6ESS

Your airplane is unique, the information in this section is based off a factory built aircraft. Do not expect everything to be exact. Proceed with caution and verify the instruments before trusting them. FLY SAFE!

FUEL SYSTEM

Sight gauge

the sight gauge is to be used as a backup. Please check your vent and sight gauge for kinks and proper line routing. Most importantly, do not take the reading for granted. Always time your fuel burns. Visually check your fuel by looking inside the fuel tank from the filler neck before each flight.

Siphoning

if your fuel system is built correctly, the overflow vent lines should be facing into the wind. The in-flight air pressure helps to counteract siphoning. When the fuel system is filled to the point it is touching the bottom of the filler neck down to 1/2" below, it is still possible for fuel to siphon. This is caused by a differential in pressure between tanks, uncoordinated flight, or turbulence. One tank will push fuel into the other. Once the tank overflows out of the vent, siphoning will start. This will continue until most of the fuel is out of the OPPOSITE TANK. Siphoning may damage the fuel tank by collapsing, and causing leaks. When filling the tanks and storing your plane, leave a 1" space between fuel and bottom of filler neck. The way to break the siphon is to stop the flow from the withdrawals on the non-siphoning tank. Since the chances of siphon are not constant, a handy way to shut off the fuel from the opposite tank is to clamp the lines with a needle nose vice grip. If you use the needle nose vice grips, slip a short segment of fuel tubing over each jaw to prevent the grips from cutting into the fuel line. If you want a more permanent method, you may want to install valves to shut off the fuel from each tank. If you chose to go this way, please follow this operational procedure: Normal operations: Both valves on. If siphoning occurs, shut off opposite fuel tank.

ENGINE OPERATIONS

Introduction

provided with the aircraft is an engine manual authorized by the engine distributor. This is a well written manual explaining many specifics for continued safe and reliable operation of your engine. We urge you to read and fully understand this manual. In addition please find the data below helpful in obtaining the most out of your aircraft.

Starting

position the aircraft into the wind and check the main wheels to prevent rolling. To maneuver the aircraft into position lift the tail at the struts connect points. Avoid lifting at the tips of control surfaces.

CAUTION
Winds above 15 mph may cause the aircraft to lift off when empty. Have an assistant sit in the plane or help hold it down at the wing strut connect points. Never hold a strut in the middle!

It is best to start the plane from inside the cockpit. The COYOTE II can be entered easily by first sitting on the seat then pulling up your knees and rotating into position. Drain the fuel sump (under LH seat). Prime or choke(if first start or if it's been 30 minutes since the last start) 3 pumps. Close the throttle (Pull back to close). Flip ignition switches up for on. Move the control stick to the left. Grab the start handle and pull briskly. Several pulls may be needed. If you are lucky enough to have an electric start, key the ignition. Be sure the ignition is on (switch up). Let it idle a moment and then advance the throttle slowly.

NOTE: After the engine warms up, 2 minutes, close the throttle. It should idle at 1,800 RPM for 912 engines (Check the Rotax manual for exact idle value.) If not refer to the engine manual for details on setting the idle. If you encounter starting difficulties refer to the engine manual for probable causes and solutions.

CAUTION
In cold weather allow at least a 2 minute warm-up before applying take-off power. Check throttle action. There should be no sluggish response from mid range to top end. Don't rapidly pump the throttle. This is not a motorcycle! This is an airplane with a big fly wheel-the propeller. Jockeying the throttle will only accelerate wear on the engine and make its reliability questionable. Be smooth with the throttle and it will respond when you need it!!

taxiing

taxiing the COYOTE II is easy even in a 25 mph wind. The direct linkage to the steerable tailwheel enhances the ground handling making tight turns a snap. If the wind is strong learn to use it to your advantage. Taxiing into the wind with forward stick will increase nosewheel traction and enhance steering. Taxi slow or you may start flying. During downwind taxiing hold the stick neutral. Make small steering corrections and taxi slow. In the hands of a skillful pilot the COYOTE II can taxi in winds up to 25 mph. Operations in 35 mph winds have been conducted with two on board. Flying in high winds above 35 mph is also possible. However, this capacity should be used only as a means to get out of a situation not to invite one.

Take offs

the COYOTE II becomes airborne easily with rotation at 35 mph (average gross weight 1010 lbs.). Naturally rotation will vary with the gross weight. Normal, short field and soft field take-offs are possible using conventional techniques.

Landings

special attention to airspeed on approach is vital to making smooth landings. As with any aircraft too little speed and power and the COYOTE II will sink out of the sky. A good way to land the first time is to plant the mains first. Get established over the runway at 50 mph plus at about 2 feet off the ground. Once things are stabilized, wings level, pitch smoothed out and flying straight down the runway, slowly reduce the power while gradually easing back on the stick, letting the plane settle onto the runway.

IMPORTANT
Hold the nose off during landing. Avoid letting it drop once the mains are on. Swerving side to side may result when the nosewheel is dropped on in cross winds or high speeds. This will familiarize you with the flare point.

Deadstick landings are done safely and smoothest if at least 50 to 60 mph can be maintained on approach. This gives you extra inertia and float, provided you flare at the right time. Lowering the flaps 2 notches in ground effect can give an extra boost to stretch the glide.

AIRWORK

The COYOTE II will perform like a conventional plane. The COYOTE II will tell you what it needs... if you are listening. Flight characteristics of the COYOTE II are similiar to planes like the J-3 Cubs, Super Cubs and T-Crafts, etc. Although all have their distinguishing manners, none do anything strange or unpredictable.

Stalls

stalls have a warning buffet due the turbulent air from the wing root flowing over the elevator. The stall occurs with a definite break. Rudder may be needed to hold the wings level. Recovery is quick with the release of back pressure. Turning, accelerated power on and power off stalls all demonstrate the slight buffet and quick recovery.

Turns

the COYOTE II banks quite easily with a minimum of adverse yaw. Lead into turns using a little rudder. Avoid steep banks until comfortable with the ship. Due to the quick turn rate, steep 360 degrees or 720 degree turns can be disorienting. Attempt these only after you are familiar with the airplane.

Flying with the doors open or removed

the COYOTE II can be flown with the doors open up to and including 65 mph. The COYOTE II doors should not be opened at airspeeds above 65 mph. The S-6ES can be flown with one (1) or both doors removed up to 65 mph. A loss in L & D, climb and cruise speed is to be expected with doors open or off .

Approved maneuvers

- Stalls, all types except whip stalls
- Falling leaf at low power settings (below 4,000 RPM 582, 3000 912)
- Chandelles
- Lazy eights

Spins up to 3 turns at idle power settings and without flaps only!

WARNING
All aerobatic maneuvers except those approved are prohibited

SPECIAL OPERATIONAL CONSIDERATIONS

Position ignition switches
up for on, down for off.

FLIGHT MANEUVERS THAT INDUCE NEGATIVE LOAD: Can induce momentary fuel starvation due to the negative G's on the float style carburetor. Avoid low level abrupt pull ups followed by an abrupt dive.

WARNING
Secure any form of cargo. Be careful of clothing articles falling into any part of the aircraft's working mechanisms. Jamming of the controls may result. Always wear the safety belts and shoulder harness to be sure these also do not interfere with the controls.

check the carburetors
during pre-flight for clamp security. It is then possible for the carburetor to rotate into a position that may cause fuel overflow and possible fuel starvation. Remove, clean and reclamp. Check the rubber manifold during preflight for cracks. Smog intense environments cause rapid decay of the rubber.

Fuel shut off valve
must be on for flight, always check it! There's enough fuel retained in the system past the valve to permit a take off followed by a dead stick landing!

Slow down
in severe turbulence, avoid descending at high rates of speed from high altitude into unknown conditions. A shear layer may be present at a lower level causing turbulence. Remember, high speeds and severe turbulence may accelerate airframe fatigue and shorten your aircraft's effective service life.

Hinges and bearings
keep all control surface hinge points and other moving parts well oiled. Use a light machine oil. Wipe off excess oil, keepmoving parts clean.

FLAPS

In general

the flap equipped COYOTE II has a wider speed envelope but this is only realized through proper flap usage. Please take the time to become thoroughly familiar with the aircraft and procedures before attempting any maximum performance take off's or landings. The aircraft functions well without using flaps, only take-off/landing distances are longer and speeds are higher. Pay close attention to the recommended flight speeds called out in this section. The first notch of flaps is used to moderately shorten take-off rolls. The max flap extension speed is 65 mph. Although it is allowable to extend to full flaps at 65 mph, it is actually better technique to extend a notch at a time.

Example:

65 mph–1st notch
55 mph 2nd notch
45 mph 3rd notch

You'll find this gives you much smoother approaches with less flap pressure. The second flap setting is used again to shorten take-offs and to smoothly decelerate to approach speed. The third notch of flaps is used only in soft field T.O.'s. Also this setting allows landings, slower approaches. Typically a 45-55 mph approach speed depending on the wing option, in a 20 degree nose low attitude is desired.

CAUTION
It is very easy to exceed 80 mph, the maximum flap extension (VFE) speed during such approaches...be wary of this.

Landing with flaps

maintain at least 50 mph with full flaps and a constant glide slope in a nose low attitude. Fly down to the runway, then level off at 2 to 3 feet to start the flair.

CAUTION
Low power and a nose high point attitude during the glide slope is to be avoided with or without full flaps.

CAUTION
Inspect flap lever catches for wear every 100 hours. Keep roller lubricate.

PROHIBITED
Spins with flaps extended.
Avoid prolonged flight at high power settings and slow airspeeds. This flight mode causes violent, turbulent airflow over the tail with associated "Tail buffet". This can be felt in a stick shake. This is a warning of an impending stall and to decrease the angle of attack and increase airspeed.

TRAILERING AND TOWING PRECAUTIONS

Introduction

when towing long distance on an open trailer remove the tail surfaces. Highway speeds and gust loads can cause undue loads on the tail group. Make certain the wings and tail components are secure and will not catch the wind underneath. Tie down the wing at the ends about 2 ft. in and in the middle.

CAUTION
If you must tow tail first with the tail group assembled lock the rudder and the elevators with a control lock. Haul like this only in moderate surface winds and drive below 35 mph. This method works fine for a few miles to the flying site but is not suited for long hauls.

DISASSEMBLY FOR TRANSPORT

The distance, terrain, weather and type of trailer will determine how much disassembly you must do to transport your COYOTE II. Usually we simply remove the wings and hang them on the wall of an enclosed trailer. Naturally, disassembly is reverse of the assembly with the exception of those items you decide to leave assembled (tail group, etc.)

CAUTION
Be VERY careful when disassembling and transporting your aicraft not to gouge, scratch or bend the wing struts. The bolts that retain the jury struts can gouge the struts if no packing is used between them. Avoid any method of dismantling or packing that can cause such damage to any part.

MAINTENANCE

Cleaning

for a major cleaning we've used soapy water and have achieved excellent results. For small gas spills and other isolated stains, we use acetone. The aluminum tubing needs no more than a damp cloth followed by a dry cloth to prevent water spotting.

IMPORTANT
If you conduct flight operations near or on salt water such as landing on beaches or float activity, a thorough fresh water washing is a must after each final flight of the day. This should be done as soon after the flight as possible. Saltwater can be the cause of serious corrosion problems for key structural elements. Internal rinsing of spars, struts and fuselage members with fresh water is required if the plane has been excessively wetted or submerged in salt water. During cleaning of any type inspect the craft for signs of corrosion and any other abnormalities.

airframe up keep

the aluminum and steel structure is designed to last for many years. However, constant abuse through hard landings and high speed flight in rough air could fatigue key structural elements. To inspect the airframe, look for cracks, hole elongation, flecking of anodizing (indicating bends or overloads), bent, dented or corroded tubing and any signs of misalignment of distortion. Consult your dealer or the factory if your inspection reveals trouble or in the event of accidental damage beyond your capabilities of repair.