PERFORMANCE BEYOND TRADITION

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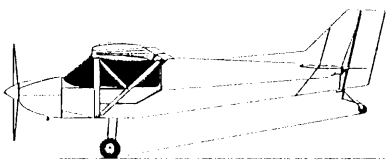
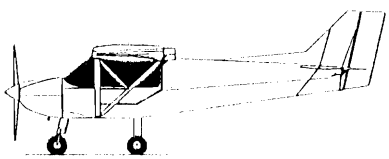
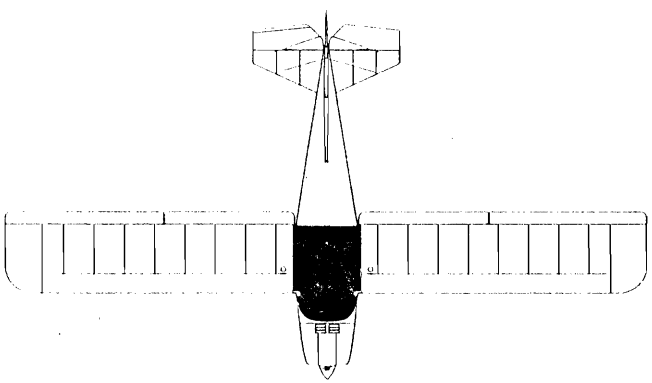
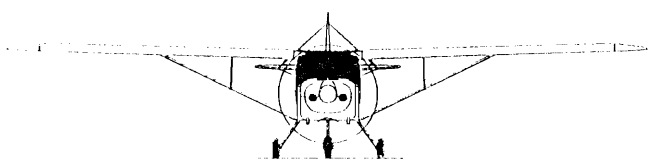
S-6S COYOTE II









STD WING, 912 ENGINE
PILOT OPERATING HANDBOOK
ISSUED: OCTOBER, 1993

SECTION 1
GENERAL

SUBJECT **PAGE**

THREE VIEW

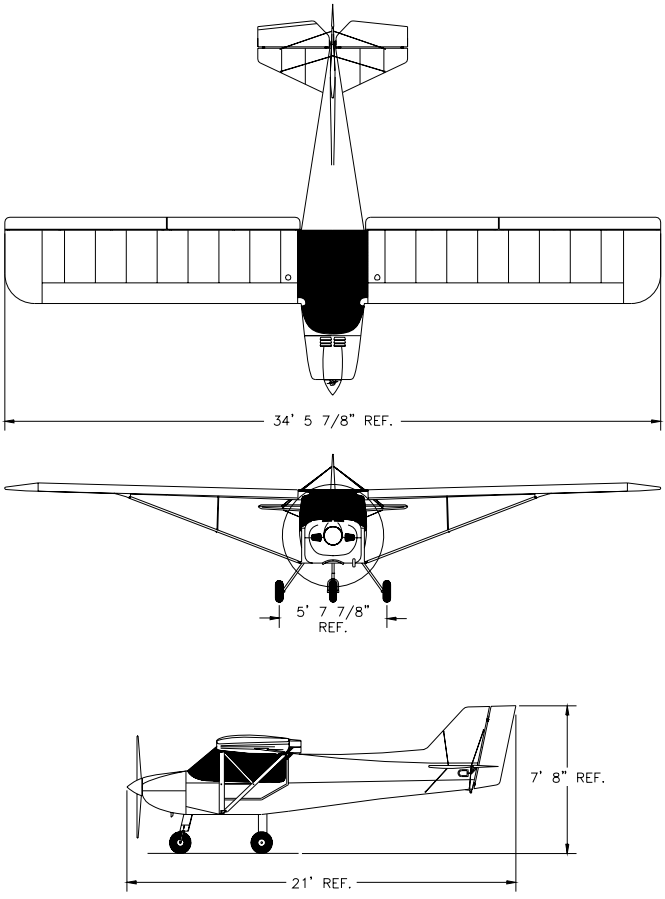


Figure 1-1

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	912UL

Engine Type: Normally aspirated, water cooled, horizontally opposed, carburetor equipped, four-cylinder engine with 73.9 in^3 (1211cm^3) 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 Number	6656RH
Propeller Diameter	66 in (1.68m)
Propeller Type	2 blade, 56 in wood Fixed Pitch

FUEL

Fuel Grade:	Premium grade gasoline 91 octane or AVGAS 100LL (blue)
Total Capacity	18 US Gal

*****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	6.4 qts. (6P)
Oil Grade	Automotive engine oil with API, SF or SG classification

Viscosity Recommendations:
Average Ambient Air Temperature:

-22EF TO +77EF (-30EC TO +25EC)	SAE 5W-50
+77EF TO +104EF (+25EC TO +40EC)	SAE 40

*****CAUTION*****
DO NOT USE AIRCRAFT ENGINE OIL

MAXIMUM WEIGHTS

Maximum Takeoff Weight	1200 lbs (544 kg)
Maximum Landing Weight	1200 lbs (544 kg)
Maximum Weight in Baggage Compartment	50 lbs (23 kg)
Maximum Weight in Aft Bagg. Compartment	30 lbs (14 kg)

TYPICAL AIRPLANE WEIGHTS

Standard Empty Weight	600 lbs (273 kg)
Maximum Useful Load	600 lbs (272 kg)

COCKPIT DIMENSIONS

Width (Maximum)	41" (104 cm)
Length (Rudders pedals to Seat Back)	42" (107 cm)
Height (Maximum)	37" (94 cm)

BAGGAGE SPACE

-Inside cabin:

Compartment Volume	2.0 ft^3 (.06 m^3)
Maximum width	37.5" (95 cm)
Maximum Length	9" (23 cm)
Maximum Depth	10" (25 cm)

-Tail cone:

Compartment Volume	6.6 ft^3 (.19 m^3)
Maximum width	34" (86 cm)
Maximum Height	28" (71 cm)
Maximum Depth	12" (31 cm)

SPECIFIC LOADINGS

At Maximum Takeoff Weight:	
- Wing Loading:	7.29 lbs/ft^2 (35.59 kg/m^2)
- Power Loading:	15.38 lbs/hp (9.36 kg/Kw)

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 speed 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 15E Celsius (59E Fahrenheit);
- The pressure at sea level is 29.92 inches Hg (1013.2 mb);
- The temperature gradient from sea level to the altitude at which the temperature is -56.5E C (-69.7E F) is approximately -2E 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 29.92 inches of Hg (1013.2 milibars).
Pressure Altitude	Altitude measured from standard sea-level pressure 29.92 inches Hg (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 (MPH)	REMARKS
V_A	Maneuvering Speed	93	Do not make full or abrupt control movements above this speed
V_{FE}	Maximum Flap Extended Speed (15E - 30E Flaps)	65	Do not exceed this speed with a given flap setting.
V_{NE}	Never Exceed Speed	120	Do not exceed this speed in any operation
V_{NO}	Maximum Structural Cruising Speed	106	Do not exceed this speed except in smooth air and then only with caution

Figure 2-1
Airspeed Limitations

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

AIRSPEED INDICATOR MARKINGS

MARKING	IAS VALUE OR RANGE (MPH)	SIGNIFICANCE
White Arc	40 - 65	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	43 -106	Normal Operating Range. Lower limit is maximum weight stalling speed. Upper limit is maximum structural cruising speed
Yellow Arc	106-120	Operations must be conducted with caution and only in smooth air
Red Line	120	Maximum speed for all operations

Figure 2-2
Airspeed Indicator Markings

POWER PLANT LIMITATIONS

Number of engines	1
Engine Manufacturer	Rotax
Engine Model Number	912
Engine Operating Limits	
Maximum Horsepower	78
Maximum Rotational Speed (RPM)(Max. 3 Minutes)	5800
Maximum Oil Temperature	285°F(140°C)
Minimum Oil Pressure	58 PSI
Maximum Oil Pressure	72 PSI

Minimum Fuel Pressure	2.2 PSI
Maximum Fuel Pressure	5.8 PSI
Maximum Coolant Pressure	17 PSI
Maximum Cylinder Head Temperature	300°F(150°C)
Fuel Grade (MOGAS ONLY)	
Minimum Octane	92 octane
Oil Grade (Automotive Engine Oil Only)	
Below +77°F (+25°C)	SAE 5W-50
Above +77°F (+25°C)	SAE 40
Number of Propellers	1
Propeller Manufacturer	Tennessee Propeller
Propeller Model	6656 RH
Propeller Diameter	66 in (1.68 m)
Propeller Operating Limits	
Rotational speed restriction	5800 RPM

POWER PLANT INSTRUMENT MARKINGS

INSTRUMENT	Red Line	Green Arc	Red Line
	MIN. LIMIT	NORMAL OPERATING	MAX. LIMIT
Tachometer (RPM)	--	1400-5500	5800
Coolant Press. (PSI)	--	8-16	17
Coolant Temp. (EF) (EC)	120 49	150-200 66-93	220 104
Fuel Press. (PSI)	--	2.2-5.8	5.8
Oil Press. (PSI)	22	30-55	80
Oil Temp. (EF) (EC)	120 49	190-230 88-110	285 140
Cylinder Head Temp. (EF) (EC)	-- --	200-270 93-132	300 149

Figure 2-3
Power Plant Instrument Markings

WEIGHTS

Maximum Weight ..... 1200 lbs (544 Kg)
Maximum Baggage at Fuselage Station 90 (229 cm) ..... 50 lbs (23 Kg)
Maximum Baggage at Fuselage Station 105 (267 cm)..... 30 lbs (14 Kg)

CENTER OF GRAVITY LIMITS

Forward limit ..... 64" (162.6 cm)
Rearward limit ..... 73" (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: (V_A) 93 IAS (MPH)

.

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors

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

FUEL LIMITATIONS

Total Capacity..... 18 US Gal
Usable Fuel..... 17.5 US Gal

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 compartment.)

MAXIMUM BAGGAGE 30 LBS

On the instrument panel (for the cabin baggage compartment.)

MAXIMUM BAGGAGE 50 LBS

Adjacent to fuel filler caps. (2 Places)

FUEL CAPACITY 9 GAL. US - 91 OCTANE MINIMUM

SECTION 3
NORMAL PROCEDURES

SUBJECT **PAGE**

PREFLIGHT INSPECTION

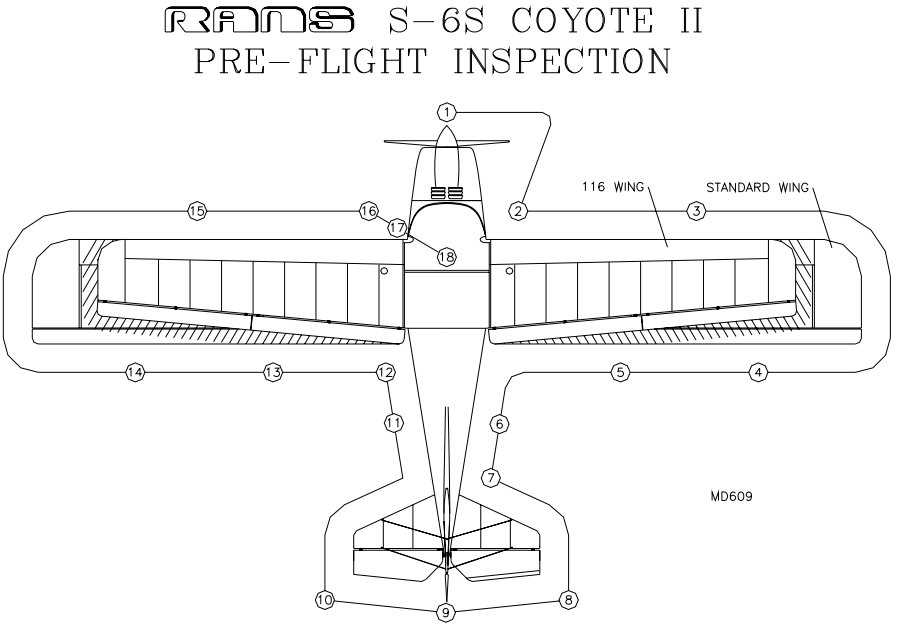


FIGURE 3-1

AIRSPEEDS FOR NORMAL OPERATIONS

Unless otherwise noted, the following speeds are based on a maximum weight of 1100 lbs (499 Kg) and may be used for any lesser weight.

	IAS (MPH)
Best Rate of Climb Speed (V_Y)	75
Best Angle of Climb Speed (V_X)	55
Approach Speed :	
Flaps UP	55
Full Flaps DOWN	50
Rotation Speeds	35
Maximum Demonstrated Crosswind Velocity	20
Maximum Flap Speed	65

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

NORMAL PROCEDURES CHECKLIST (CONT)

PREPARATION (CONT)

Charts and navigational equipment..... On board

Performance and range..... Computed and safe

PREFLIGHT 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. 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

4. 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 and 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).

5. FUSELAGE (RIGHT SIDE)

General Condition ..... Check

Antennas ..... Check

Fabric ..... Check for tears

Tubes ..... No bends or dents

6. EMPENNAGE

General Condition Free of damage, ice, snow or frost

Elevator & Trim Tab ..... Free of interference

Rudder ..... Free of interference

Tie Down ..... Remove

7. FUSELAGE (LEFT SIDE)

General Condition ..... Check

Fabric ..... Check for tears

Tubes ..... No bend

BEFORE ENGINE STARTING:

Preflight Inspection ..... Complete

Seat Belts and Harnesses ..... Fastened

Brakes ..... Apply

Switches ..... Off

BEFORE ENGINE STARTING (CONT.):

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

TAXIING (CONT.)

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

TAKE OFF-NORMAL (CONT.)

Throttle ..... Full Throttle

Left rudder (Right rudder for Rotax 912 engine) ..... As needed

Airspeed ..... Rotate at 75 MPH IAS

Accelerate to 55 MPH, then climb out.

SHORT FIELD, OBSTACLE CLEARANCE TAKEOFF

Wing Flaps ..... Down 2 notches

Brakes ..... Apply

Throttle ..... Full Throttle

Brakes ..... Release

Airspeed ..... Accelerate to 45 MPH

Left rudder (Right rudder for Rotax 912 engine) ..... 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

CLIMB (CONT.)

Airspeeds (IAS) ..... 75 MPH IAS

CRUISE

Throttle ..... 4800 RPM

Trim Tab ..... Adjust

Engine Instruments ..... Monitor

DESCENT, NORMAL

Seat Belts and Harnesses ..... Fastened

Altimeter ..... Set

Throttle ..... 4000 RPM

Airspeed ..... 75 MPH IAS

APPROACH AND LANDING

Airspeed ..... Trim to 65 MPH

Flaps ..... Up

Final Approach Speed ..... 45 MPH

BALKED LANDING

Throttle ..... Full Throttle

Flaps ..... Up

Airspeed ..... Until clear of obstacles: 50 MPH IAS

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
PERFORMANCE

THE PERFORMANCE NUMBERS PRESENTED IN THIS SECTION ARE MEASURED FROM FACTORY BUILT AIRCRAFT. YOUR AIRCRAFT PERFORMANCE MAY VARY.

STALL SPEEDS

STALL SPEEDS POWER OFF

WEIGHT	FLAPS POSITION	BANK ANGLE			
		0E	30E	45E	60E
		IAS			
		MPH (km/h)	MPH (km/h)	MPH (km/h)	MPH (km/h)
1200 lbs (544 Kg)	UP	39 (63)	42 (67)	46(75)	55 (89)
	1st NOTCH	38 (61)	41 (66)	45(73)	54 (86)
	2nd NOTCH	36 (58)	39 (62)	42(69)	51 (82)
	3rd NOTCH	35 (56)	38 (61)	42(67)	50 (80)

NOTES:

1. Maximum altitude loss during stall recovery is approximately 75 ft (23 m)
2. IAS values are approximate

RATE OF CLIMB

WEIGHT	PRESS ALT. ft (m)	CLIMB SPEED (IAS) MPH(Km/h)	RATE OF CLIMB FPM (m/min)
1200 lbs (544 Kg)	SL	75 (120)	1000 (304)
	2000 (610)	75 (120)	850 (259)
	4000 (1220)	75 (120)	700 (213)
	6000 (1830)	75 (120)	550 (168)
	8000 (2440)	75 (120)	400 (121)

NOTES:

Full throttle, flaps up, standard conditions
No instrument error correction

CRUISE PERFORMANCE

PRESS. ALT.	RPM	IAS	FUEL CONS
		MPH (Km/h)	Gal/h (l/h)
2000	5500	100 (161)	5.0 (19)
4000	5500	97 (157)	5.0 (19)
6000	5500	95 (153)	5.0 (19)
8000	5500	93 (149)	5.0 (19)
10,000	5500	90 (145)	5.0 (19)

TAKEOFF DISTANCE

WEIGHT lb (Kg)	PRESS ALT. ft (m)	GROUND ROLL ft (m)	TO CLEAR 50 FT OBSTACLE (15 m)
1200 (544)	SL	145 (44)	450 (140)

NOTES:

1. Decrease distance 10% for each 10 mph (17 Km/h) headwind
2. Increase distance by 10% for each 3 mph (4 Km/h) tailwind
3. For dry grass runway increase ground roll distance by 15%
4. Power 100%

LANDING DISTANCE

WEIGHT lb (Kg)	PRESS ALT. ft (m)	TO CLEAR 50 FT OBSTACLE (15 m)	GROUND ROLL ft (m)
1200 (544)	SL	775 (236)	200 (61)

NOTES:

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

SECTION 5
WEIGHT AND BALANCE

SUBJECT **PAGE**

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*****
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:

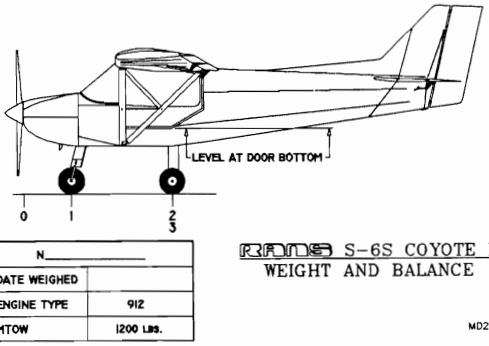
a. Record the weight shown on each scale.

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.

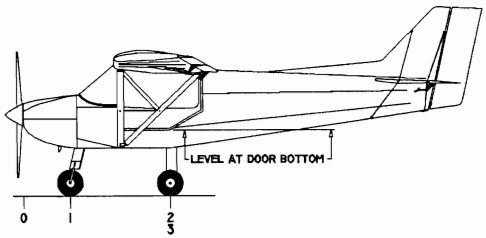


ACCEPTABLE C.G 62.5" (158.8 cm) TO 73" (185 cm) FROM DATUM 0.0 FOR LOADED AIRCRAFT
DATUM = FACE OF THE PROP FLANGE

EXAMPLE AIRCRAFT EMPTY WEIGHT & BALANCE CALCULATION				
No.	ITEM	WEIGHT	ARM	MOMENT
1	NOSE GEAR	210	26" (66 cm)	5460
2	MAIN GEAR RH	214	78" (198 cm)	16692
3	MAIN GEAR LH	220	78" (198 cm)	17160
	TOTAL =	644	TOTAL =	39312

$$CG = \frac{TOTAL\ MOMENT}{TOTAL\ WEIGHT} = \frac{39312}{644} = 61.04''\ AFT\ DATUM$$

FIG. 5.1 EXAMPLE



N_____	
DATE WEIGHED	
ENGINE TYPE	912
MTOW	1200 LBS.

RANS S-6S COYOTE II
WEIGHT AND BALANCE

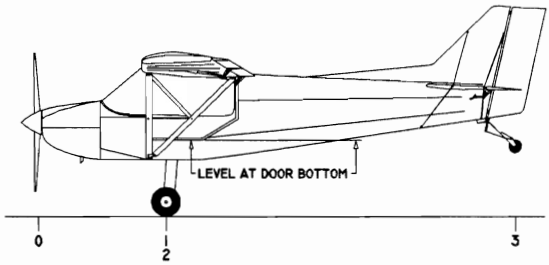
MD2317

ACCEPTABLE C.G 62.5" (158.8 cm) TO 73" (185 cm) FROM DATUM 0.0,FOR LOADED AIRCRAFT
DATUM = FACE OF THE PROP FLANGE

TRICYCLE GEAR CONFIGURATION				
YOUR AIRCRAFT EMPTY WEIGHT & BALANCE CALCULATION				
No.	ITEM	WEIGHT	ARM	MOMENT
1	NOSE GEAR		26.25" (66 cm)	
2	MAIN GEAR RH		78" (198 cm)	
3	MAIN GEAR LH		78" (198 cm)	
	TOTAL =		TOTAL =	

$$CG = \frac{TOTAL\ MOMENT}{TOTAL\ WEIGHT} = \_\_\_\_\_ = \quad AFT\ DATUM$$

FIG. 5.2 Empty weight & balance for tricycle gear configuration



ACCEPTABLE C.G 62.5" (158.8 cm) TO 73" (185 cm) FROM DATUM 0.0,FOR LOADED AIRCRAFT
DATUM = FACE OF THE PROP FLANGE

TAILDRAGGER GEAR CONFIGURATION				
YOUR AIRCRAFT EMPTY WEIGHT & BALANCE CALCULATION				
No.	ITEM	WEIGHT	ARM	MOMENT
1	MAIN GEAR LH		57" (145 cm)	
2	MAIN GEAR RH		57" (145 cm)	
3	TAILWHEEL		226" (574 cm)	
	TOTAL =		TOTAL =	

$$CG = \frac{TOTAL\ MOMENT}{TOTAL\ WEIGHT} = \_\_\_\_\_ = AFT\ DATUM$$

FIG.5.3 Empty weight & balance for taildragger configuration

WEIGHT AND BALANCE RECORD

AIRCRAFT MODEL			SERIAL NO.						PAGE NO.	
DATE	ITEM No.		DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE					RUNNING EMPTY WEIGHT	
				ADDED (+)			REMOVED (−)			
	IN	OUT		WT. (lb) (Kg)	ARM (in) (cm)	MOMENT /1000 MOMENT	WT. (lb) (Kg)	ARM (in) (cm)	MOMENT /1000	WT. (lb) (Kg)	MOMENT /1000

Fig 5.4 Weight and Balance Record

AIRCRAFT LOADING

Determing the loaded aircraft C.G.

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

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

3. Add up the weight column and enter the total.

4. Add up the moment column and enter the total.

5. Find the Center of Gravity using the formula provided.

6. 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.

ACCEPTABLE C.G 62.5" (158.8 cm) TO 73" (185 cm) FROM DATUM 0.0,FOR LOADED AIRCRAFT

DATUM = FACE OF THE PROP FLANGE

ITEM	WEIGHT	ARM	MOMENT
EMPTY AIRCRAFT			
PILOT & PASSENGER		72" (183 cm)	
WING TANK FUEL (18 US.Gal)		72" (183 cm)	
BAGGAGE (COCKPIT 50 Lb Max.)		90" (229 cm)	
BAGGAGE (Aux. 30 Lb Max.)		105" (267 cm)	
TOTAL=		TOTAL=	

$$CG = \frac{TOTAL\ MOMENT}{TOTAL\ WEIGHT} = \quad - \quad = \quad AFT\ DATUM$$

FIG 5.5 Loading Schedule

NOTE 1: FUEL WEIGHT @ 6 lbs/Gal.
NOTE 2: SEE EXAMPLE AT THE END OF THIS SECTION

EXAMPLE : AIRCRAFT LOADING

This example will assume an S-6S with no Aux. fuel tank and a 116 wing with gross weight of 1100 lb. The empty weight & balance was done in FIG. 5.1. Let's assume the following weights:

Pilot and Passenger ..... 340 lbs
Baggage (cockpit) ..... 10 lbs
Baggage (Aux.) ..... 15 lbs
Wing Tank Fuel (15 US Gal.) ..... 90 lbs
based on the assumptions above:

ITEM	WEIGHT	ARM	MOMENT
EMPTY AIRCRAFT	644	61.04	39312
PILOT & PASSENGER	340	72" (183 cm)	24480
WING TANK FUEL (15 US.Gal)	90	72" (183 cm)	6480
BAGGAGE (COCKPIT 50 Lb Max.)	10	90" (229 cm)	900
BAGGAGE (Aux. 30 Lb Max.)	15	105" (267 cm)	1575
TOTAL=	1099	TOTAL=	72747

$$CG = \frac{TOTAL\ MOMENT}{TOTAL\ WEIGHT} = \frac{72747}{1099} = 66.19\ AFT\ DATUM$$

FIG. 5-6 EXAMPLE

SECTION 6
FLYING THE S-6S

SUBJECT **PAGE**

SECTION 6
FLYING THE S-6S

SUBJECT **PAGE**

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 2,000 RPM (1800 RPM for 912 engines)*****. 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!!

***** Or set the idle as recommended by the engine manufacturer.

COYOTE II OPERATIONS

INTRODUCTION: 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!

TAXIING: Taxiing the COYOTE II is easy even in a 25 mph wind. The direct linkage to the steerable nosewheel 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 operations.

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!

ALL AEROBATIC MANEUVERS EXCEPT THOSE APPROVED ARE PROHIBITED

SPECIAL OPERATIONAL CONSIDERATIONS

POSITION IGNITION SWITCHES: Up is 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, keep moving 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 (V_{FE}) 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 lubricated.

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 craft 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.