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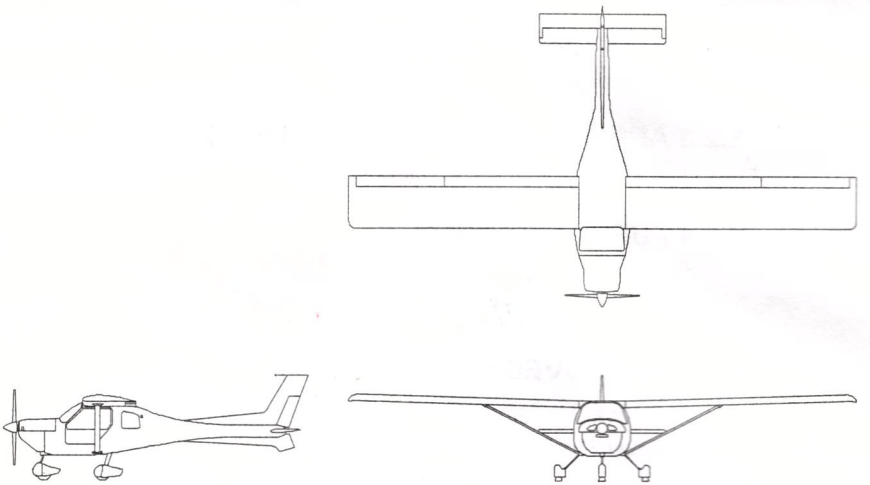
Section: 1 GENERAL

1.1 THREE VIEW DRAWING



Ground Turning Radius = 5.7 metres. 18.7'

1.2 DESCRIPTIVE DATA

1.2.1 ENGINE

Manufacturer:	Jabiru Aircraft Pty Ltd
	Aero Engines Division
Type:	2200 Air Cooled

1.2.2 PROPELLER

Manufacturer:	Jabiru Aircraft Pty Ltd
Type:	Fixed Pitch Wooden Dwg No. C000242
Diameter:	1422 mm
Pitch:	1040 mm

1.2.3 APPROVED FUEL TYPES AND GRADES

100 LL or 100/130 grade aviation gasoline

1.2.4 FUEL CAPACITY

Total:	60	50.0 litres	13.2 galls.
Useable	57.5	47.5 litres	12.5

1.2.5 APPROVED OIL GRADES

Aero Oil W Multigrade 15W- 50

Or equivalent Lubricant Complying with,

MIL-L-22851C, or

Lycoming Spec301F, or

Teledyne Continental Spec MHF-24B

1.2.6 OIL CAPACITY

Sump capacity is 2.3 litres

1.2.7 TYRE INFLATION PRESSURES

Mains:	168 kpa	(24 psi)
Nose:	84 - 105 kpa	(12-15 psi)

Section: 2 LIMITATIONS

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Section: 2 LIMITATIONS

2.1. INTRODUCTION

Section 2 includes operating limitations, instrument markings and basic placards necessary for the safe operation of the airplane, its engine, standard systems and standard equipment. Observance of these operating limitations is required.

The aeroplane shall be operated so that the limitations and instructions included in this section are observed.

2.2. TYPE OF OPERATION

VFR by Day Maximum Altitude 10000'

No aerobatics, including Spins.

2.3. AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown below.

SPEED	KIAS	REMARKS
V ne Never exceed speed	116	Do not exceed this speed in any operation.
V no Maximum structural cruising speed	91	Do not exceed this speed except in smooth air, and then only with caution.
V a Manoeuvring speed	91	Do not make full or abrupt control movements above this speed.
V fe Maximum flap extended speed	70	Do not exceed this speed with flaps down.

Airspeed Indicator Markings and their operational significance are shown below.

MARKING	KIAS Value/Range	SIGNIFICANCE
White Arc	35 – 65	Full flap operating range. Lower limit is max. weight Vso in landing configuration. Upper limit is max. speed permissible with flaps extended.
Green Arc	46 – 91	Normal operating range. Lower limit is Take-off Safety speed. Upper limit is max. structural cruising speed.
Yellow Arc	91 –116	Operations must be conducted with caution and only in still air.
Red Line	116	Vne

2.4. WEIGHTS and LOADING

Maximum takeoff weight 450 kg

Maximum landing weight 450 kg

2.5. CENTRE OF GRAVITY LIMITS

Forward: 1601 mm aft of datum up to & including 400 kg
1661 mm aft of datum @ 450 kg.
Variation is linear between 400 & 450 kg.

Aft 1695 mm aft of datum at all ~~weights~~ weights

Datum : 1403 mm forward of RLE of Mainplane

Leveling Means:

Longitudinal Spirit Level placed on I the lower doorsill on the left-hand side of the fuselage.

Lateral Spirit Level placed across the fuselage forward of the firewall on cowl location rubbers.

2.6. POWERPLANT LIMITATIONS

Airspeed Indicator Markings and their operational significance are shown below.

MARKING	KIAS Value/Range	SIGNIFICANCE
White Arc	40 - 70	Full flap operating range. Lower limit is max. weight Vso in landing configuration. Upper limit is max. speed permissible with flaps extended.
Green Arc	54 - 91	Normal operating range. Lower limit is Take-off Safety speed. Upper limit is max. structural cruising speed.
Yellow Arc	91 -116	Operations must be conducted with caution and only in still air.
Red Line	116	Vne

2.4. WEIGHTS and LOADING

Maximum takeoff weight 430 kg (946 lb

Maximum landing weight 430 kg (946 lb

2.5. CENTRE OF GRAVITY LIMITS

Forward: 1601 mm aft of datum up to & including 400 kg
1661 mm aft of datum @ 430 kg.
Variation is linear between 400 & 430 kg.

Aft 1682.4 mm aft of datum at all weights

Datum : 1403 mm forward of RLE of Mainplane

Leveling Means:

Longitudinal Spirit Level placed on I the lower doorsill on the left-hand side of the fuselage.

Lateral Spirit Level placed across the fuselage forward of the firewall on cowl location rubbers.

2.6. POWERPLANT LIMITATIONS

Instrument	Yellow Arc	Green Arc	Red Radial Line/Arc
Tachometer			3200 RPM
Oil Temperature		50°C - 118°C	118°C
Oil Pressure	80 kPa - 220 kPa	220 kPa - 525 kPa	80 kPa
Cylinder Head Temperature		100°C - 200°C	200°C

Minimum Oil Temperature for Takeoff	Needle must be seen to move off the stop before Takeoff	
Minimum Oil Pressure	in Level Flight or climb	220 kPa
	In Descent	80 kPa
Maximum Cylinder Head Temperature		200°C
Maximum RPM for all operations		3200
Full Throttle Static RPM	Not Above	3000
	Not Under	2800

2.7. OTHER LIMITATIONS

2.7.1. AUTHORISED MANOEUVRES AND ASSOCIATED LIMITATIONS

Aerobatic manoeuvres, including spins, are not approved.

2.7.2. SMOKING

Prohibited.

2.7.3. MAXIMUM AIR TEMPERATURE FOR OPERATIONS

40^{O}c for takeoff at gross weight.

2.7.4. FLIGHTS WITH DOORS REMOVED

Prohibited.

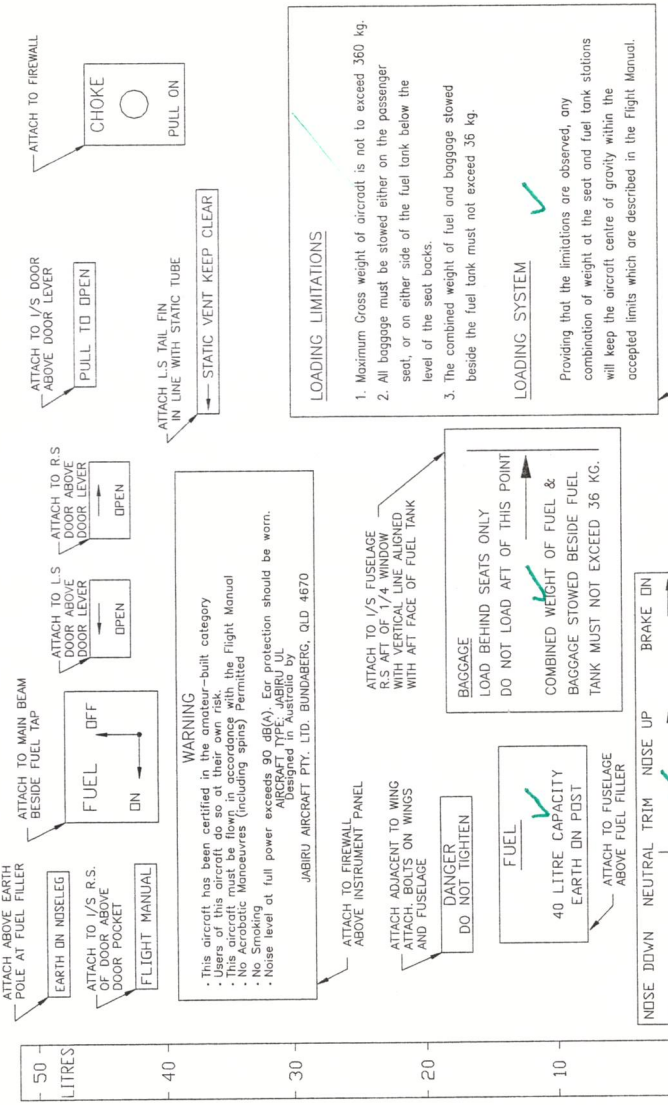
2.7.5. MAXIMUM PERMISSIBLE NUMBER OF OCCUPANTS

Two (including Pilot).

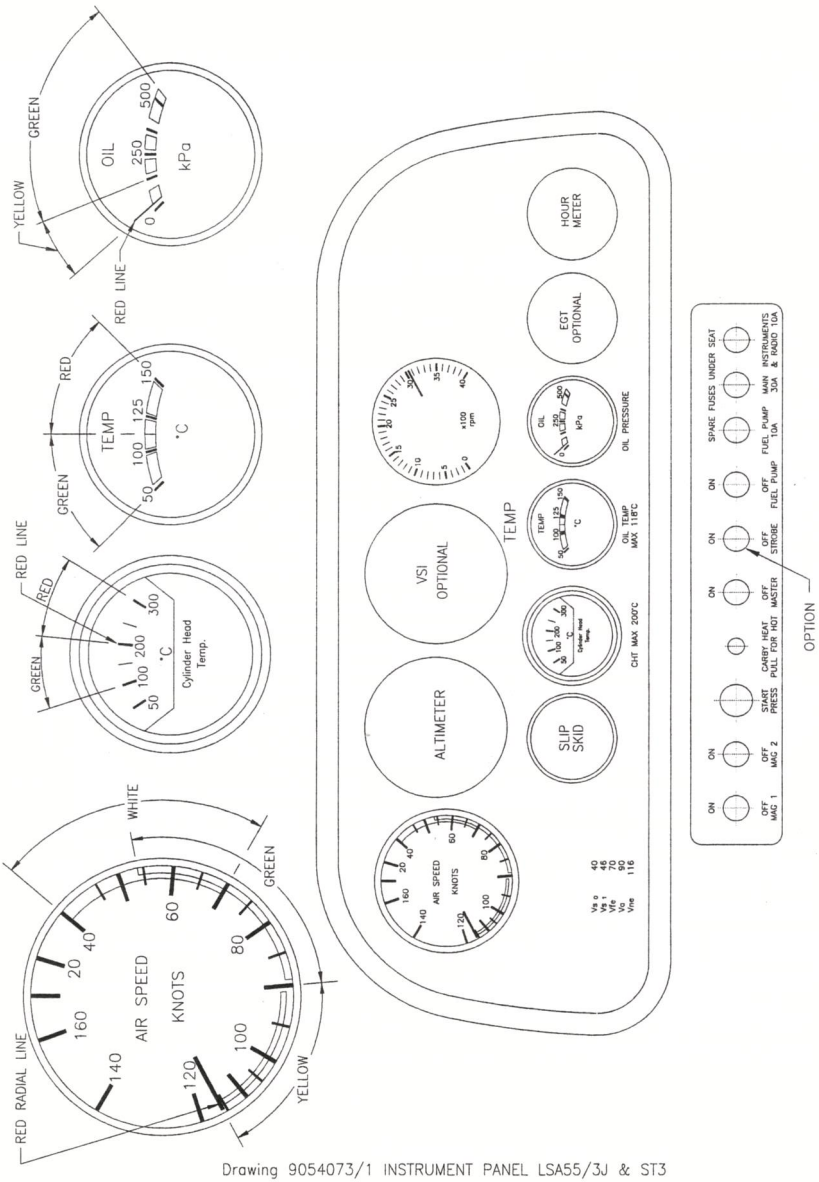
2.7.6. MAXIMUM CROSSWIND VELOCITY

14 knots

2.9. PLACARDS



Drawing 9051063/1 DECAL SET JABIRU UL



Drawing 9054073/1 INSTRUMENT PANEL LSA55/3J & ST3

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Section: 3 EMERGENCY PROCEDURES

3.1 INTRODUCTION

Section 3 provides checklist and other procedures for coping with emergencies that may occur. Emergencies caused by aeroplane malfunctions are rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimised or eliminated by careful flight planning and good judgement when unexpected weather is encountered. However, should an emergency arise, the basic guidelines outlined in this section should be considered and applied as necessary to correct the problem.

3.2 AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff	60-65 KIAS
Manoeuvring Speed (at all weights)	91 KIAS
Maximum Glide Distance, Still Air	72 KIAS [1]
Precautionary Landing Approach with Engine Power	55 KIAS
Landing Approach Without Engine Power:	
landing Flaps Up	70 KIAS
landing Flaps Down	57 KIAS

Note[1] A slightly higher speed may give better distance over the ground if gliding into wind; a slightly lower speed if gliding downwind.

3.3 OPERATIONAL CHECKLISTS

3.3.1 ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF RUN

1	Throttle	Idle
2	Brakes	Apply
3	Ignition Switches	OFF
4	Master Switch	OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1	Airspeed	60-65 KIAS
2	Fuel Shutoff Valve	OFF
3	Ignition Switches	OFF
4	Wing Flaps	as required
5	Master Switch	OFF

ENGINE FAILURE DURING FLIGHT

1	Airspeed	Best Glide Angle 72 KIAS [1]
2	Carburetor Heat	ON
3	Fuel Shutoff Valve	ON
4	Fuel Pump	ON
5	Ignition Switches	ON

Note[1] *A slightly higher speed may give better distance over the ground if gliding into wind; a slightly lower speed if gliding downwind*

AIRSTART & LIMITATIONS

In the event that the engine is stopped during flight, it may be restarted by application of fuel & ignition, provided that the propeller is still windmilling.

The propeller may stop windmilling below 50 KIAS.

The JABIRU 2200 engine is a high compression (9.0 : 1) engine & therefore airstarts when the propeller has stopped rotating, without use of starter, are unlikely before reaching V ne.

Therefore, the following procedure addresses only airstarts by use of the Starter Motor.

IMPORTANT

DO NOT **depress starter button while propeller is rotating.**

1	Ignition Switches	OFF
2	Cabin	Clear
3	Increase angle of attack & reduce speed (up to & including a stall) until propeller stops rotation	
4	Establish Glide	72 KIAS
5	Fuel	ON
6	Master	ON
7	Ignition Switches	ON
8	Starter Button	Depress
9	Throttle	Open
10	Repeat as necessary: ensuring propeller has stopped rotation before each restart attempt.	

Note: The engine cools quickly with the propeller stopped. Choke may need to be used to start.

3.3.2 FIRES

FIRE DURING START ON GROUND

1	Cranking	CONTINUE to get a start that would suck the flames and accumulated fuel through the carburettor and into the engine.	
If engine starts,			
2	Power	1500 RPM	
3	Fuel	OFF & allow engine to empty carburettor	
4	Engine	Inspect for damage	
If engine fails to start,			
5	Cranking	CONTINUE in an effort to obtain a start. If no start in 15 seconds, Shut off fuel & continue to crank for another 15 seconds.	
6	Fire Extinguisher	Obtain (have ground attendants obtain if not installed).	
7	Engine	SECURE.	
		A Master Switch	OFF
		B Ignition Switch.....	OFF
		C Fuel Pump Switch..	OFF
		D Fuel Shutoff Valve.	OFF
8	Fire	Extinguish using fire extinguisher, wool blanket, or dirt.	
9	Fire Damage	Have authorised people inspect, repair damage or replace damaged components or wiring before conducting another flight.	

ENGINE FIRE IN FLIGHT

1	Throttle	CLOSED
2	Fuel Shutoff Valve	OFF
3	Mag Switches	OFF
4	Master Switch	OFF
5	Fuel Pump Switch	OFF
6	Cabin Air	OFF
7	Airspeed	72 KIAS (if fire is not extinguished, increase glide speed to find an airspeed which will provide an incombustible mixture).
8	Forced Landing	Execute (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

1	Master Switch	OFF
2	All Other Switches	OFF
3	Vents/cabin air	OPEN
If fire appears out and electrical power is necessary for continuance of flight:		
4	Master Switch	ON
5	Fuses	CHECK for faulty circuit, **DO NOT** reset or replace.
6	Radio/Electrical Switches	ON one at a time, with delay after each until short circuit is localised.
7	Land as soon as possible to inspect for damage	

CABIN FIRE

1	Master Switch	OFF
2	Vents/Cabin Air	OPEN
3	Land as soon as possible to inspect for damage.	

3.3.3 FORCED LANDING

EMERGENCY LANDING WITHOUT ENGINE POWER

1	Airspeed	60-65 KIAS (flaps UP) Approach 57 KIAS (flaps DOWN)
2	Fuel Shutoff Valve	OFF
3	Fuel Pump	OFF
4	Ignition Switches	OFF
5	Wing Flaps	as required
6	Master Switch	OFF
7	Touchdown	Slightly Tail Low
8	Brakes	as required

PRECAUTIONARY LANDING WITH ENGINE POWER

1	Airspeed	60-65 KIAS
2	Wing Flaps	1st Stage
3	Fuel Pump	ON
4	Selected Field	FLY OVER Note terrain and obstructions
5	Radio and Electrical Switches	ON
6	Wing Flaps	FULL (on final approach)
7	Airspeed	57 KIAS
8	Touchdown	Slightly Tail Low
9	Ignition Switch	OFF
10	Brakes	as required

DITCHING

1	Radio	Transmit MAYDAY on area frequency, giving location and intentions.
2	Heavy Objects	SECURE
3	Approach	High winds, heavy seas INTO wind Light winds, heavy swells Parallel to Swells
4	Wing Flaps	FULL
5	Power	establish 50 ft/min descent at 50-55 KIAS
6	Touchdown	level attitude
7	Face	Cushion at touchdown with folded coat or cushion
8	Aeroplane	Evacuate through cabin doors. If necessary, breakout windows and flood fuselage to equalise pressure so doors can be opened.
9	Lifevests	Inflate

LANDING WITH A FLAT MAIN TYRE

1	Wing Flaps	FULL
2	Approach	Normal
3	Touchdown	GOOD TYRE FIRST hold aeroplane off flat tyre as long as possible with aileron control.

3.3.4 ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

If fuse blows, unload the circuit and replace fuse (spares under Pilot seat). If it blows again, continue to next airport and rectify.

If main fuse fails, land at the next airport and replace. Run the engine; if the fuse again fails, rectify before continuing flight.

3.3.5 MAXIMUM GLIDE

For Minimum Rate of Sink: 72 KIAS

For Maximum Distance in Still Air: 72 KIAS

To maximise distance achieved into wind, increase glide speed by approximately 1/3 of wind velocity.

Glide performance will be improved (if time permits) by stopping propeller windmilling. This can be achieved by slowing below 50 knots.

3.3.6 RECOVERY FROM AN INADVERTENT SPIN

Aerobatic manoeuvres, including spins, are prohibited

While inadvertent spins are unlikely, should this occur, proceed as follows:

1	Throttle	IDLE
2	Ailerons	NEUTRALISE
3	Rudder	Opposite direction of spin and HOLD ON
4	Just AFTER rudder reaches the stop, move the control stick FORWARD far enough to break the stall. Full down elevator may be required at aft centre of gravity loadings to assure optimum recoveries.	
5	HOLD these control inputs until rotation stops. Premature relaxation of control inputs may extend the recovery.	
6	As rotation stops, neutralise rudder and make a smooth recovery from the resulting dive	

3.4 OTHER PROCEDURES

3.4.1 CARBURETTOR HEAT

This system serves to prevent the formation of ice within the carburettor, where it primarily forms on the throttle plates in such a manner as to obstruct the airflow, with resultant eventual engine stoppage. Vaporisation of the fuel & expansion of air through the carburettor cause a cooling of the mixture, which can be as much as 15 degrees C below the temperature of the ambient air. This permits moisture in the air to condense & form ice. The first indications of icing are an RPM drop or a drop in manifold pressure. Progressive icing will cause obstruction of the carburettor, which manifests itself in the form of a rough running engine. During this time the smaller volume of air aspirated has richened the mixture. Ice can form more rapidly with partial throttle, due to the lower pressure in the carburettor. At full throttle, the danger is lessened somewhat. Therefore, carburettor heat is not to be used during takeoff or climb, also because it creates a small power loss.

In Cruise 2 mins every 15 mins.

IMPORTANT

During descent & approach, the carburettor heat should be used because low power settings create low pressures in the induction manifold. In case of a go-around, turn the carburettor heat OFF. Prolonged use of carburettor heat with more than 80% power applied could provoke detonation.

When using Carburettor Heat, pull knob to FULL ON.

DO NOT use partial Carburettor Heat.

3.4.2 IGNITION MALFUNCTION

A sudden engine roughness or misfiring is usually evidence of ignition problems. Switching from both ON to alternately switching each system OFF will identify which system is malfunctioning. Switch to the good system and proceed to the nearest airport for repairs.

3.4.3 LOW OIL PRESSURE

1	A rapid drop from normal indicated pressure to indication "0"	
	Action	Observe for smell of oil
		Open cabin air vents
		Observe for signs of spilt oil on cowls, windscreen, wing struts
		If strong smell of oil and oil appearing on airframe, reduce power to minimum to sustain level flight and proceed to nearest landing area.
		Be prepared to make an emergency landing enroute, should the engine fail.
2	Gradual reduction in oil pressure below observed normal position:	
	Action:	Observe oil temperature indications
		If oil temperature is higher than normal indications and all other engine functions are normal, proceed to the nearest landing area, land and check oil levels and external oil system for leaks
		If oil level is low, top-up to full mark on dipstick
		Allow engine to cool, start engine, run to full power and recheck oil pressure
		If oil pressure readings are normal, proceed with flight, observing both oil pressure and temperature readings.
		If, after the run-up check, the oil pressure remains low, have the engine checked by an authorised person.

Section: 4 NORMAL OPERATIONS

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Section: 4 NORMAL OPERATIONS

4.1. INTRODUCTION

Section 4 provides checklist and other procedures for the conduct of normal operations.

4.2. SPEEDS FOR NORMAL OPERATION

The following speeds are based on a maximum weight of 450 kg and may be used for any lesser weight.

Takeoff:		
	Initial Climb Out, 1st Stage Flap	55 KIAS
	Short Field Takeoff, 1st Stage Flap Speed at 50 Feet..	50 KIAS
	When Clear of obstacles, retract flaps and climb at	62 KIAS
Climb, Flaps Up:		
	Normal	62 KIAS
	Best Rate of Climb, at low altitude	62 KIAS
	Best Climb Gradient at low altitiude	60 KIAS
	Note: Best Obstacle clearance gradient is with 1st Stage Flaps at 62 KIAS; but do not maintain this condition for longer than necessary as this may cause excessive engine temperatures	
Landing Approach:		
	Normal Approach, Flaps Full	57 KIAS
	Short Field Approach, Flaps Full.	50 KIAS
Baulked Landing		
	Apply full power; allow speed to increase to	62 KIAS
	Retract Flap to 1st Stage until clear of obstacles	

Section: 4 NORMAL OPERATIONS

4.1 INTRODUCTION

Section 4 provides checklist and other procedures for the conduct of normal operations.

4.2 SPEEDS FOR NORMAL OPERATION

The following speeds are based on a maximum weight of 430 kg and may be used for any lesser weight.

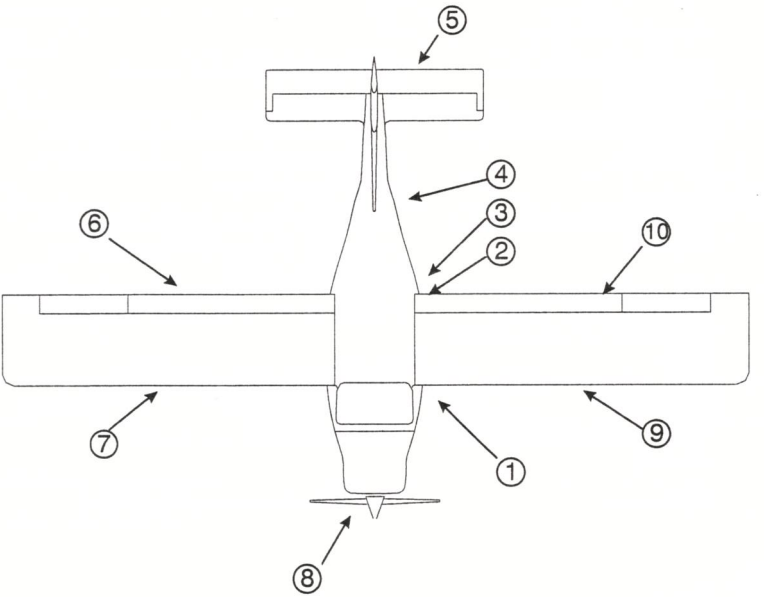
Takeoff:		
	Initial Climb Out, 1st Stage Flap	65 KIAS
	Short Field Takeoff, 1st Stage Flap Speed at 50 Feet..	60 KIAS
	When Clear of obstacles, retract flaps and climb at	72 KIAS
Climb, Flaps Up:		
	Normal	72 KIAS
	Best Rate of Climb, at low altitude	72 KIAS
	Best Climb Gradient at low altitiude	68 KIAS
	Note: Best Obstacle clearance gradient is with 1st Stage Flaps at 62 KIAS; but do not maintain this condition for longer than necessary as this may cause excessive engine temperatures	
Landing Approach:		
	Normal Approach, Flaps Full	57 KIAS
	Short Field Approach, Flaps Full.	55 KIAS
Baulked Landing		
	Apply full power; allow speed to increase to	65 KIAS
	Retract Flap to 1st Stage until clear of obstacles	

Then retract flap fully and continue to climb at or above	72 KIAS
Maximum Recommended Turbulent Air Penetration Speed	91 KIAS
Maximum Demonstrated Crosswind Velocity	14 Knots

4.3 CHECKLIST & PROCEDURES

4.3.1. PREFLIGHT INSPECTION

Prior to flight, the aircraft should be inspected in accordance with the following checklists and in the sequence shown in the following diagram:



NOTE

Visually check airplane for general condition during walk-around inspection. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control rods and cables are free of ice and move freely.

PREFLIGHT INSPECTION CHECKLISTS

CABIN

1	Flight manual	AVAILABLE IN THE AIRCRAFT.
2	Control lock.	REMOVE Seatbelt Fastening
3	Ignition Switches	OFF
4	Master Switch	OFF
5	Fuel Shutoff Valve	ON
6	Seatbelts and Shoulder Harnesses	CHECK condition and security
7	Aileron Cable Mountings & Rod Ends	CHECK for free rotation & excessive movement, bolts secure & anchors on rear of seats secure.
8	Elevator Cable Mounting & Rod End	CHECK for free rotation & excessive movement, bolt secure & anchor on Main Beam secure.
9	Rudder & Nose Wheel Steering Push Rods & Rod Ends	CHECK for security & free movement
10	Flap Control	CHECK free movement & bolts secure.
11	Throttle & Carburettor Heat Controls	CHECK for full & free travel.
12	Brake Lever	CHECK for free travel & pressure.

FUEL

1	Fuel Quantity	CHECK level in tank through side window or inside cabin.
2	Water Check	Before first flight of the day & after each refueling, use sampler cup & drain small quantity of fuel from fuel tank sump quick-drain valve & check for water & sediment.
3	Fuel Filler Cap	CHECK secure

LEFT UNDERCARRIAGE		
1	Mount Bolts	CHECK security
2	Tyre	CHECK inflation & wear.
STATIC SOURCE		
1	Static Source	CHECK for blockage.
EMPENNAGE		
	Tail Tie-down	DISCONNECT
	Control Surfaces	CHECK freedom of movement & security
	Rudder, Elevator & Trim Cable	CHECK freedom of movement & security
RIGHT WING - TRAILING EDGE		
1	Aileron	CHECK freedom of movement & security.
2	Flap	CHECK security
3	Control Rods & Cables	CHECK aileron & flap control bolts & nuts & flap control rod for security. CHECK rod ends for freedom of rotation & excessive movement
RIGHT WING		
1	Wing Tie-down	DISCONNECT.
2	Main Wheel Tyre	CHECK for proper inflation & wear or damage.
3	Wing Strut Mount Bolts (top & bottom)	CHECK for security
	CAUTION *Wing Strut attachment bolts must be free to rotate. DO NOT TIGHTEN. Ensure Nut just bears on washer.*	
4	Wing Root Mount Bolts	CHECK for security.
5	Pitot Tube	REMOVE cover & CHECK opening for blockage.

NOSE

1	Propellor & Spinner	CHECK for nicks & security
2	Cowl	REMOVE & CHECK security of engine components & systems, particularly mounts, spark plugs, wiring,fuel lines, baffles CHECK for oil leaks
3	Engine Oil Level	CHECK & top up if necessary. Clean up any spilt oil.
4	Cowl	REPLACE & CHECK clips fastened & secure & pins located
5	Front Wheel	CHECK for proper inflation & wear or damage.

LEFT WING

1	Main Wheel Tyre	CHECK for proper inflation & wear or damage.
2	Wing Strut Mount Bolts	CHECK for security.
	CAUTION Wing Strut attachment bolts must be free to rotate.DO NOT TIGHTEN. Ensure Nut just bears on washer	
3	Wing Root Mount Bolts	CHECK for security
4	Wing Tie-down	DISCONNECT

LEFT WING - TRAILING EDGE

1	Aileron	CHECK freedom of movement & security
2	Flap	CHECK security.
3	Control Rods & Cables	CHECK aileron & flap control bolts & nuts & flap control rod for security. CHECK rod ends for freedom of rotation & excessive movement

4.3.2 BEFORE STARTING ENGINE

1	Preflight Inspection	COMPLETE
2	Seatbelts & Harness	ADJUST & LOCK
3	Fuel Shutoff Valve	ON
4	Radio/Intercom	OFF
5	Brakes	TEST & SET

4.3.3 STARTING ENGINE - COLD ENGINE.

1	Carburettor Heat	COLD
2	Choke	ON
3	Throttle	CLOSED
4	Fuel Boost Pump	ON
5	Propeller Area	CLEAR
6	Master Switch	ON
7	Ignition Switches	ON
8	Start Button	PRESS
9	Note: If the engine is cranking below 300 RPM, it will not start	
	As soon as engine is running, throttle back to an idle speed of 900 – 1000 RPM	
10	Check all engine instruments for function	
11	Choke	CLOSED

IMPORTANT. Check the engine oil pressure.

If you do not see oil pressure within 10 seconds, shut down the engine immediately and determine the cause.

4.3.4 STARTING ENGINE - HOT ENGINE.

Proceed as for cold engine above, but eliminate the priming operation 3. Instead, open throttle to 1/4.

4.3.5 WARM-UP and FUNCTIONAL CHECK

Warm-up the engine with a fast idle of 1000 - 1200 RPM until the oil temperature reaches 50 degrees C. During this phase, the cooling of the cylinder head is insufficient due to reduced airflow across the cylinders. It is therefore advisable not to shorten the warm-up time by running the engine at higher RPM. The aeroplane should be pointed into wind to allow additional cooling air. As soon as the oil reaches 50 degrees C, it is possible to do the run-up.

4.3.6 BEFORE TAKEOFF

1	Brakes	CHECK
2	Cabin Doors	CLOSED & LATCHED
3	Flight Controls	FREE & CORRECT
4	Flight Instruments	SET
5	Fuel Shutoff Valve	ON
6	Elevator Trim	NEUTRAL
7	Flaps	SET FOR TAKEOFF
8	Ignition Check	Throttle to 2000 RPM Hold this engine speed for 10 seconds. Switch OFF No. 1 Ignition and watch for RPM drop. Switch ON the No. 1 Ignition & switch OFF the No. 2 Ignition watching for the RPM drop. RPM drop should not exceed 100 RPM on either system. If drop is excessive, shut down & determine the reason. Switch No. 2 Ignition ON.
	NOTE During the check with one system only, the inactive sparkplugs may tend to load up slightly. To clean plugs, run the engine with both ignitions for a few seconds, then recheck the second system.	
9	Power Check	Throttle to 2850 RPM Open the throttle fully & slowly to check

		the maximum RPM being produced. Wind conditions may effect, but as an average 2850 RPM should be seen.
	NOTE If the RPM is found to be more than 150 RPM lower than normal, the engine should be examined to determine the reason.	
10	Idle Check	Throttle back to idle position & check that the engine runs smoothly. With too low an idle speed, or rough running, the cause must be located & corrected to avoid the potential for an in-flight stoppage
11	Carburettor Heat Check	Throttle up to 2000 RPM Pull out the Carburettor Heat Control & look for an RPM drop. Return the Carburettor Heat Control to the Full IN or cold position.

4.3.7 TAKEOFF

Normal Takeoff

1	Wing Flaps	1st Stage
2	Carburettor Heat	COLD
3	Throttle	FULL.....OPEN
4	Elevator Control	LIFT NOSE WHEEL AT 40-45 KIAS and wait for aircraft to fly itself off (at around 55 KIAS)
5	Climb Speed	65 KIAS until Flaps retracted, then 72 KIAS.
6	At top of Climb, Fuel Boost Pump	OFF

Short Field Takeoff

1	Wing Flaps	1st Stage
2	Carburettor Heat	COLD
3	Brakes	APPLY
4	Throttle	FULL OPEN
5	Brakes	RELEASE
6	Elevator Control	SLIGHTLY TAIL LOW
7	Climb Speed	60 KIAS (until all obstacles are cleared).
8	Wing Flaps	RETRACT slowly increasing speed to 72 KIAS

4.3.8 ENROUTE CLIMB

1	Airspeed	72 KIAS
2	Throttle	FULL OPEN

NOTE

During climb, monitor the cylinder head & oil temperatures to avoid exceeding their limits. The aircraft has been tested to ensure adequate cooling in climb, therefore any excessive readings may indicate a malfunction. Should this occur, decrease the rate of climb in order to increase the airspeed for improved cooling.

4.3.9 CRUISE

1	Power	Not above maximum continuous power of 3050 RPM.
2	Elevator Trim	ADJUST.

4.3.10 BEFORE LANDING

1	Seatbelts & Harnesses	ADJUST & LOCK
2	Carburettor Heat	as required
3	Fuel Boost Pump	ON

4.3.11 LANDING

Normal Landing

1	Airspeed	57 KIAS
2	Wing Flaps	FULL DOWN (below 70 KIAS)
3	Touchdown	MAIN WHEELS FIRST
4	Landing Roll	LOWER NOSE WHEEL GENTLY
5	Braking	MINIMUM REQUIRED

Short Field Landing

1	Airspeed	55 KIAS
2	Wing Flaps	FULL DOWN (below 70 KIAS)
3	Power	REDUCE to idle as obstacle is cleared
4	Touchdown	MAIN WHEELS FIRST
5	Brakes	APPLY AS REQUIRED
6	Wing Flaps	RETRACT when convenient for better braking

Baulked Landing

1	Throttle	FULL OPEN
2	Carburettor Heat	COLD
3	Wing Flaps	RETRACT to 1/2 DOWN
4	Airspeed	65 KIAS until clear of obstacles
5	Wing Flaps	RETRACT TO 1st STAGE until clear of obstacles then retract fully and continue to climb at or above 72 KIAS

4.3.12 AFTER LANDING

1	Wing Flaps	UP
2	Fuel Boost Pump	OFF
3	Carburettor Heat	Full IN or Cold

4.3.13 SECURING AIRPLANE

1	Radio/Intercom	OFF
2	Ignition Switches	OFF
3	Master Switch	OFF
4	Controls	LOCK with seatbelt
5	Fuel	OFF

4.4 OTHER PROCEDURES

4.4.1 FUELING

SAFETY WARNINGS

* Never prepare fuel in an area that is enclosed or where fumes could reach ignition point. DO NOT SMOKE or allow open flames or sparks in the vicinity. Never add fuel while the engine is running.

* Never refuel an aircraft if fuel could be spilled on hot engine components (this should not be a problem with the JABIRU due to the location of the fuel tank and filler).

* Use only approved fuel containers and never transport fuel in an unsafe manner.

* Always check for fuel contamination. Contamination is a major cause of engine failure. The best place to avoid contamination is at the source. Once your fuel is in the container a very hazardous potential exists. Use a clean safety approved storage container. Do not overfill the container - allow for expansion.

* The engine is designed for use with aviation gasolines only. Be sure to use products of at least the standard shown in Section 1.

* Always earth the aircraft through the Earthing Point provided at the fuel filler before removing the fuel cap.

* Before first flight of the day, and after each refueling, use a sampler cup and drain a small quantity of fuel from the fuel tank sump quick drain valve -check for water, sediment and contamination.

Where there is a suspicion that water may be present in the fuel tank, the following procedure is to be followed.

* Lower the empennage of the aircraft to near the ground and rock the aircraft up and down and side to side at the same time. Repeat up to 10(ten) times.

* Check fuel tank sump by sampling fuel.

* If water is present, repeat the entire procedure until you are certain that no water remains in the tank or fuel system.

* Where doubt still exists the aircraft fuel system should be examined by a qualified person and fully stripped and drained before flight.

4.4.2 TAXIING

When taxiing, it is important that speed and use of brakes be kept to a minimum and that all controls be utilized (see Taxiing Diagram, Figure 4.1) to maintain directional control and balance.

The carburettor heat control knob should be pushed full IN (that is, NOT selected) during all ground operations unless heat is absolutely necessary.

Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propellor.

DO NOT accelerate over loose gravel or cinders or propeller damage will result.

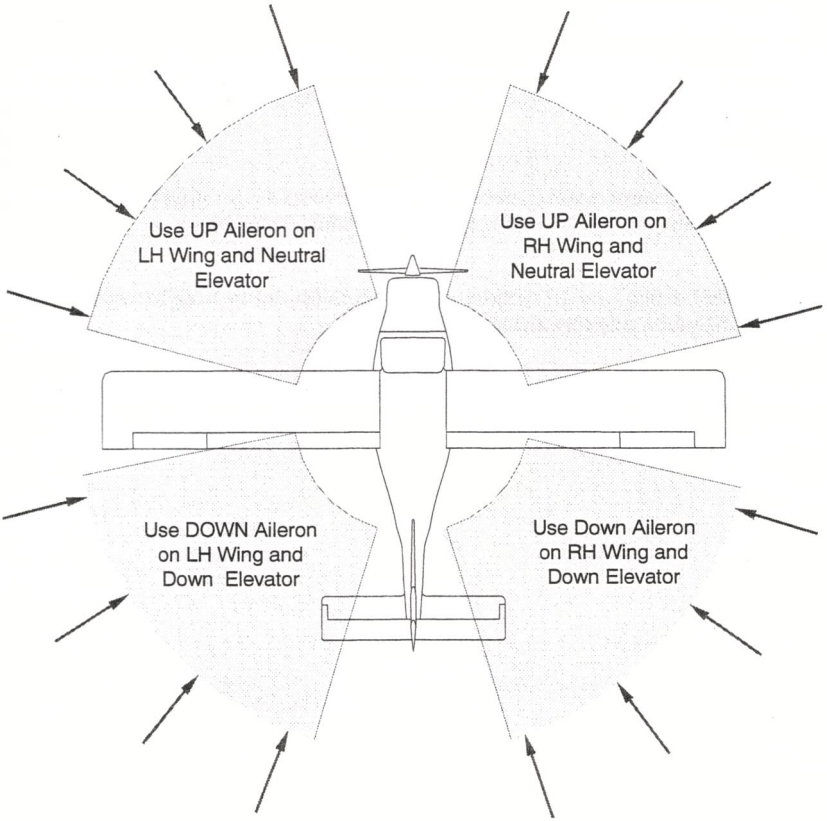


Figure 4.1 - Taxiing Diagram

4.4.3. PROPELLOR CARE

Full throttle runups over loose gravel are especially harmful to propellor tips. When takeoffs must be made over a gravel surface, it is very important that the throttle is advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown behind the propellor rather than pulled into it. When unavoidable small nicks appear in the propellor, they should be immediately corrected.

4.4.4. CROSSWIND TAKEOFF

Takeoffs into strong crosswinds are normally performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higher than normal, and then pulled off positively and smoothly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

4.4.5. CRUISE

Normal cruising is performed between 75 % and 90 % power. Continuous cruise should not be above 3150 RPM. Flights should be planned at 15 litres per hour with 45 minutes reserve, with appropriate allowances for wind conditions which will assist in determining the most favourable altitude and power setting for a given trip.

4.4.6. CROSSWIND LANDING

The limiting crosswind velocity of 14 knots has been demonstrated at FULL Flap. However, in strong crosswind conditions use the minimum flap consistent with the strip length available.

Use the Wing Low technique right through to touchdown and land on Mains first.

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4.4.5 CRUISE

Normal cruising is performed between 75 % and 90 % power. Continuous cruise should not be above 3050 RPM. Flights should be planned at 15 litres per hour with 45 minutes reserve, with appropriate allowances for wind conditions which will assist in determining the most favourable altitude and power setting for a given trip.

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The limiting crosswind velocity of 14 knots has been demonstrated at FULL Flap. However, in strong crosswind conditions use the minimum flap consistent with the strip length available.

Use the Wing Low technique right through to touchdown and land on Mains first.

4.4.7 BAULKED LANDING

In a baulked landing (go-around) climb, the wing flap setting should be reduced to the First Stage immediately after full power is applied and the aircraft has accelerated to a safe climb speed. Upon reaching a safe airspeed, the flaps should be slowly retracted to the full up position, whilst allowing the aircraft to accelerate to the best climb speed.

4.4.8 NOISE ABATEMENT

Increased emphasis on improving the quality of our environment requires renewed effort on the part of all pilots to minimize the effect of airplane noise on the public.

As pilots, we can demonstrate our concern for environmental improvement by application of the following procedures:

1	At altitudes under 2000 feet, avoid flying in close proximity to houses or over parks and recreational areas
2	During approach to or departure from an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise sensitive areas.

The certified noise level for the JABIRU at 430 kg maximum weight is 63dB(A). No determination has been made by the Air Services Australia that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or from, any airport.

4.4.9 VISIBLE MOISTURE

Where flights are likely to include operations in visible moisture or rain, the use of RAIN-X window treatment is recommended. RAIN-X is available from JABIRU as Part No. PM0900.

4.4.10 STOPPING THE ENGINE

To stop the engine, turn OFF the ignition switches and turn OFF the Master Switch. Carburettor Heat should be returned to the Full IN or cold position.

4.4.11 STARTING THE ENGINE FROM EXTERNAL POWER SOURCE

Where it is necessary to start the engine from an external power source:

	Remove Top cowl
	Place jumper leads directly on battery terminals, ensuring positive to positive and negative to negative
	Start as for normal operation
	Stop engine, remove jumper leads,refit cowl

WARNING

Wheels must be chocked.
Ensure propeller is clear.
Ensure qualified person is in the operator seat.
Do not attempt to refit cowl with propeller running.

Section: 5 PERFORMANCE

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5.1.2. NATURE OF STALL WARNING 2
5.2. TAKEOFF & LANDING DISTANCES 3
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Section: 5 PERFORMANCE

5.1 STALLING

5.1.1 STALL SPEEDS

(In KIAS and power off condition)

Flap Setting	Zero	Stage 1 Takeoff	Stage 2 Landing
Maximum Takeoff & Landing Weight	41	39	35

5.1.2 NATURE OF STALL WARNING

Configuration		Stall Warning
Power Off	Clean Flap Stage 1 Flap Stage 2	Audible Warning horn 5 – 8 knots before stall.
Power Full	Clean Flap Stage 1 Flap Stage 2	Audible Warning horn 5 – 8 knots before stall

5.2 TAKEOFF & LANDING DISTANCES

Takeoff safety speed is 1.3 Vsi	65 KIAS
Landing Approach speed (Minimum Flap, Full Flap)	57 KIAS

The unfactored, sea-level takeoff distance to 50' at NIL wind or slope, on a short dry grass surface, is 412 metres. The sea-level take-off strip length exceeds the landing strip length.

Takeoff and Landing Distance is therefore 412 metres times 1.4 = 577 metres.

This distance is established using the normal technique described in paragraph 4.3.7.

This distance must be increased by a distance increment of 115 metres for each one thousand feet (1000') of pressure altitude.

5.3 MAXIMUM CROSSWIND FOR TAKEOFF & LANDING

14 knots.

Section: 6 WEIGHT, BALANCE & EQUIPMENT LIST

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Section: 6 WEIGHT, BALANCE & EQUIPMENT LIST

6.1 Introduction

This section contains basic weight and center of gravity information necessary to ensure correct loading of the aircraft and comprises Empty Aircraft Limitations, Aircraft Weight and Loading System Pages. These documents, separately approved by an Aircraft Weight Control Officer, are to be carried in the Flight Manual at all times.

6.2 Aircraft Weight Record

Registration No.	
Aircraft Model	
Serial Number	
Issue	
Date	
Expiry Date	

Aircraft	Empty	Basic
Weight (kg)		
Arm (mm aft of datum)		
Moment (kg mm)		

Notes:

1 empty aircraft includes undrainable oil, unusable fuel (0.5 kg), and kg of fixed ballast in the rear ventral fin.

2 Basic aircraft includes full oil.

....

Weight Control Officer Date.

6.3. Loading System

6.3.1. General

Previous Issues of Jabiru Flight Manuals provided a simplified loading system that used a set of loading rules. The system was intended as a ready reference type of approach, but involved a lot of conservatism. The conservatism has proved restrictive for the UL-450 model aircraft, and because of this the simplified loading system has been withdrawn. Acceptable Weight and Balance conditions must be verified using the Load and Trim System.

6.3.2. Load and Trim System

The load and trim system is provided in the trim chart, which is shown at Figure 6.1. The chart, is a graphic representation of the weight and balance calculations for the aircraft.

The aircraft is loaded correctly, only if **both** the **Zero Fuel Weight** and the **Take-Off Weight** cases fall inside the area in the defined envelope.

The Chart is used as follows:

1. Enter the chart at the top by taking the **Basic Aircraft Moment** taken from Page 6/2, dividing by 1000 and locating this value on the top axis that is labelled "Index Units/1000 (kg.mm)..
2. Drop a vertical line down until it intersects with a sloping line in **the "Weigh on Seats**" Box.
3. Move horizontally across to the right one line for each 10 kg of Pilot, Passenger, and/or Baggage Weight that is loaded on the seats.

   (i.e. move 7 and ½lines for a crew weight of 75-kg.)
4. Drop a vertical line down from this point in the Weight on Seats Box, until it intersects with a sloping line in the "**Weight of Baggage**" Box.
5. Move horizontally across to the right one line for each 5 kg of Baggage Weight that is loaded on or beside the fuel tank.

   (i.e. move 2 lines for a baggage weight of 10 kg)

6 Drop a vertical line down from this point in the "**Baggage Weight Box**", until it intersects with a sloping line in the "**Quantity of Fuel Box**". This defines the **Zero Fuel Condition**

6.3 Loading System

6.3.1 General

There are two loading systems available to determine whether the aircraft is correctly loaded.

The first system, which is detailed in Section 6.3.1, consists of a number of rules which may be used in the first instance to evaluate the aircraft's situation. This method is quick and simple, however it is based on a number of simplifications,. If the loading does not meet these rules, the loading should be rechecked using the more complicated load and trim system which is detailed in Section 6.3.2. This latter method allows a greater variety of loading possibilities.

It is important to understand that if either the Section 6.3.1, or the Section 6.3.2 method shows a particular loading to be acceptable then the aircraft may be flown at that loading.

6.3.2 Simplified Loading Rules

The aircraft may be loaded with any combination of weights at the fuel tank and crew stations within the limits given in Table 6.1.

Limitations	
1	The maximum all up weight of the aircraft is not to exceed 430kg.
2	All baggage must be stowed either on the passenger seat or on either side of the fuel tank below the level of the seat backs.
3	The combined weight of the fuel and baggage stowed beside the fuel tank must not exceed 36 kg.
4	The combined weight of the crew and baggage stowed on the seats must not exceed the value of (400 – aircraft empty weight) kg.
5	The minimum weight of the crew is 45 kg.

Table 6.1 Loading Limitations

6.3.3 Load and Trim System

The load and trim system is provided in the trim chart which is shown at Section 6.2. The chart, at Figure 6.2 is a graphic representation of the weight and balance calculations for the aircraft.

The aircraft is loaded correctly, only if **both** the **zero fuel** and **takeoff** cases fall inside the area in the total weight section.

The Chart is used as follows:

1. Enter the chart at the top with the Basic Aircraft Moment taken from Page 6/2.
2. Follow the sloping lines down to the total weight of the crew and baggage on the seats.
3. Go straight down to the top of the next box, then draw two line, one straight down to the bottom box, the other follows the sloping lines down to the total weight of fuel and baggage behind the seats. From this point draw a line straight down.
4. Calculate the takeoff weight and zero fuel weight as shown below. Draw horizontal lines from these weights to intersect with the two vertical lines drawn previously.
5. The intersection of both lines must fall within the the area shown.

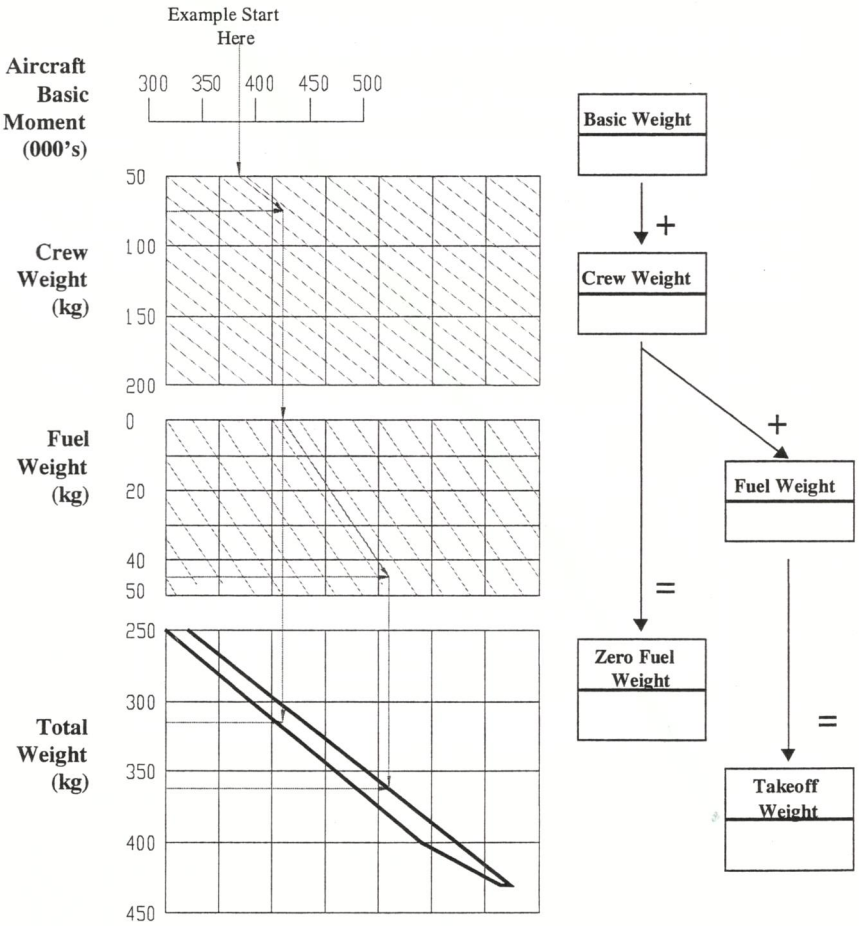
To calculate the weight of fuel in kg, multiply the amount of fuel in litres by 0.72.

Fuel Wt

1 ltr = .72 kilo
10 ltr. 7.2 kilo

60 = 43.2 kg.

Figure 6.2 Aircraft Load and Trim System



6.4 Weight Limits

Maximum takeoff weight	=	430 kg (946 lb)
Maximum landing weight	=	430 kg (946 lb)

6.5 Center of Gravity Limits

6.5.1 Empty Aircraft Limitations

The validity of the loading systems for the aircraft depends on the empty aircraft meeting the following limitations.

The intersection of the empty weight and empty arm must fall between the two lines on the graph in Figure 6.1. The empty aircraft is defined as having all normal equipment installed, together with unusable fuel of 0.5 kg in the fuel tank and undrainable engine oil.

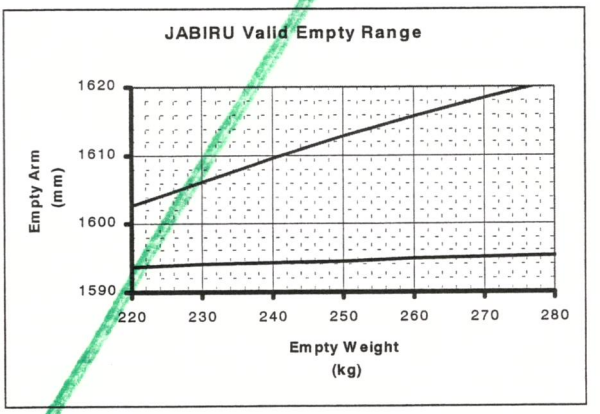


Figure 6.1 : JABIRU Valid Empty Range

6.4. Weight Limits

Maximum takeoff weight = 450 kg (992 lb)
Maximum landing weight = 450 kg (992 lb)

6.5. Center of Gravity Limits

6.5.1. Operational Aircraft Center of Gravity Details

Forward Limit: 1601 mm aft of datum up to & including 400 kg
1661 mm aft of datum @ 450 kg
Variation is linear between 400, and 450 kg

Aft Limit 1695 mm aft of datum at all weights

Datum 1403 mm forward of the Leading Edge of Right Hand Wing.

Levelling Means

Longitudinal Spirit Level placed on the lower doorsill on the left-hand side of the fuselage.

Lateral Spirit Level placed across the fuselage forward of the firewall on cowl location rubbers.

Crew Station 1688mm aft of datum

Fuel Station 2215mm aft of datum

Engine Oil Station 430 mm aft of datum

6.5.2 Operational Aircraft Center of Gravity Limits

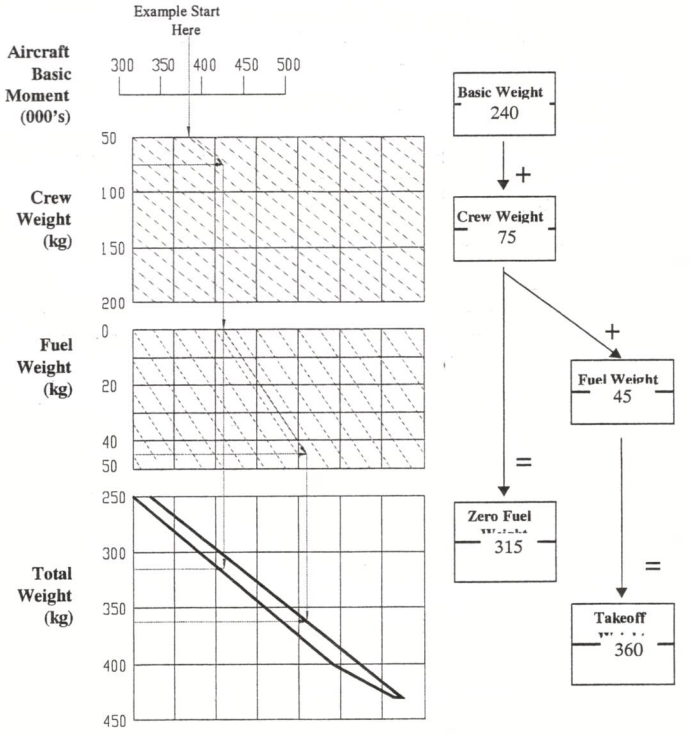
Forward:	1601 mm aft of datum up to & including 400 kg
	1661 mm aft of datum @ 430 kg
	Variation is linear between 400, and 430 kg
Aft	1682.4 mm aft of datum at all weights
Datum	1403 mm forward of RLE of Mainplane
Levelling Means	
Longitudinal	Spirit Level placed on the lower doorsill on the left-hand side of the fuselage.
Lateral	Spirit Level placed across the fuselage forward of the firewall on cowl location rubbers.

6.6 Sample Calculations

Sample Load System Calculations:

Aircraft Basic Weight	240	kg
Total Crew Weight	75	Kg
Zero Fuel Weight	31.5	Kg
Fuel and Baggage	45	Kg
Takeoff Weight	360	kg

Basic Aircraft Moment = 384,000 kg mm.



6.6. Aircraft Equipment List

Items listed in the following table were fitted to the aircraft at manufacture and were included in the aircraft basic weight.

Generic Item	Specific Item Description
Engine	Jabiru 2200A
Propeller	Jabiru Fixed Pitch Wooden
Flight Instruments	
Airspeed Indicator	
Altimeter	
Slip/Skid	
Compass	
Vertical Speed Indicator	
Stall Warning System	
Engine Instruments	
Tachometer	
Oil Pressure Gauge	
Oil Temperature Gauge	
Cylinder Head Temperature Gauge	
Hour-meter	
Communications Equipment	
VHF Transceiver	
Headsets x 2	
Intercom	
Headphones	
Miscellaneous Equipment	
Seat Cushions	
Door Map Pockets	
Sound Curtain	
Seat Belts	
Electrical Storage Battery	
Fixed ballast	

6.7 Aircraft Equipment List

Items listed in the following table were fitted to the aircraft at manufacture and were included in the aircraft basic weight.

Generic Item	Specific Item Description	Number Fitted
Engine	Jabiru 2200J	
Propeller	Jabiru Fixed Pitch Wooden	
Flight Instruments		
Airspeed Indicator		
Altimeter		
Slip/Skid		
Compass		
Vertical Speed Indicator		
Stall Warning System		
Engine Instruments		
Tachometer		
Oil Pressure Gauge		
Oil Temperature Gauge		
Cylinder Head Temperature Gauge		
Hourmeter		
Communications Equipment		
VHF Transceiver		
Headsets x 2		
Intercom		
Headphones		
Miscellaneous Equipment		
Seat Cushions		2
Door Map Pockets		
Sound Curtain		2
Seat Belts		
Electrical Storage Battery		2
Fixed ballast		