

Section 10

Flight Training Supplement

10.1 Introduction

This section contains information on the basic flight controls, door operation, and entry and egress, followed by a flight training outline compiled by Jabiru transition instructors. This supplement is presented here to give new Jabiru pilots important information on the flying and control characteristics of the J230.

10.2 Flight Controls

The J230-SP uses traditional rudder pedals for yaw control (see Figure 10-1). The rudder pedals are also linked to the nose gear for steering on the ground.

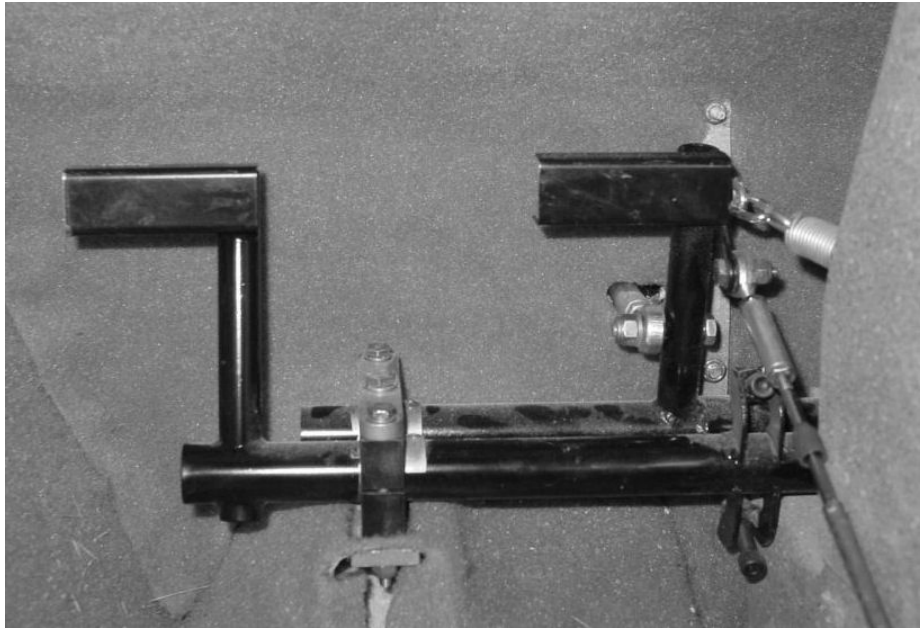


Figure 10-1: Rudder Pedals



Figure 10-2: Control Stick

The pitch and roll controls are actuated using a single, center console control stick (see Item 1, Figure 10-2). Fore and aft movement of the control stick actuates the pitch control and left-right movement of the stick actuates the roll control.

The aircraft has dual engine throttle controls positioned on the far left and right sides of the instrument panel (see Items 1 and 2, Figure 10-3).



Figure 10-3: Instrument Panel

The secondary controls on the J230-SP are the elevator trim, braking, and wing flap actuation controls.

The elevator trim is actuated using a lever on the center console (see Item 1, Figure 10-4). Pulling the lever aft results in a nose-up condition and pushing the lever forward results in a nose-down condition. To assist in moving the pitch trim lever in flight, apply slight pressure to the control stick in the same direction at the same time.

The aircraft brakes are actuated using a lever on the center console (see Item 2, Figure 10-4). Pulling the lever aft actuates both left and right wheel brakes equally. Releasing the lever returns it to the neutral position. The brake lever also incorporates a parking brake lock which is engaged with the opening in the center console after actuating the brake lever (see Item 3, Figure 10-4). During taxi and flight operations, make sure the parking brake lock trails to the rear of the brake handle to avoid inadvertent locking of the parking brake.

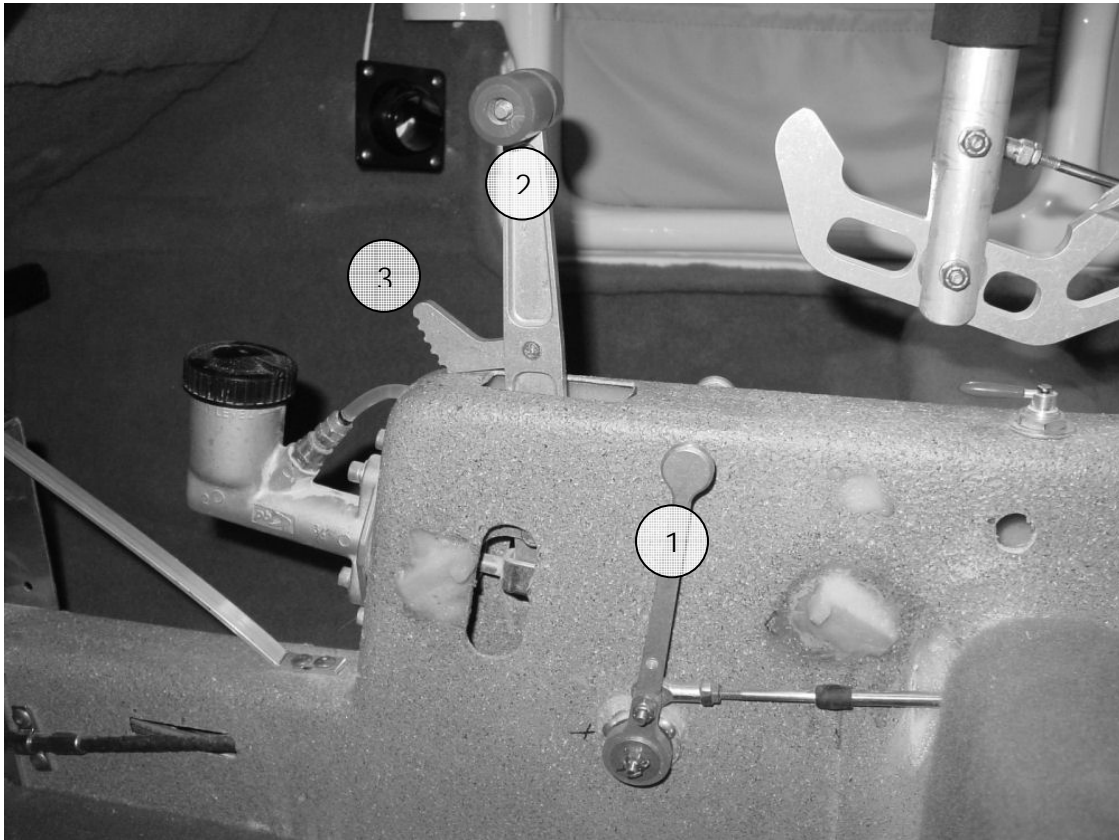


Figure 10-4: Elevator Trim and Brake Levers

The wing flaps are electrically actuated by a servo mounted in the roof area of the cockpit. The wing flap control switch is a three-position momentary switch located on the left side of the instrument panel above the throttle control (see Item 3, Figure 10-3). Pushing the switch upward raises the flaps and pushing the switch downward lowers the flaps. The flap position indicator is an LED bar located on the right side of the pilot's EFIS screen.

10.3 Door Operation

The J230-SP is equipped with three doors—pilot, copilot, and baggage. The baggage compartment door is located on the pilot side of the aircraft behind the pilot door. Each of the doors is operated in the same manner, and each includes a locking device for security.

To unlatch the door for opening, push the latch handle forward until the door pin disengages. Figure 10-5 and Figure 10-6 show the door latches and operating directions. From inside the aircraft, slide the door latch handle forward to disengage the door pin and open the door. Newer J230 interior door latches must be pushed downward to open the door.

When closing the cabin doors, it is important to engage the ball latch mechanism on the upper portion of the door. From outside the aircraft, gently press the door against the door jamb, push slightly on the top window frame to engage the ball latch, then press the lower portion of the door against the door sill and slide the door latch aft to engage the locking pin. From inside the aircraft, hold the latch handle forward (or down, in the case of newer aircraft) and pull the door against the frame with the other hand. Gently

press downward on the armrest to engage the ball mechanism, then slide the latch aft.

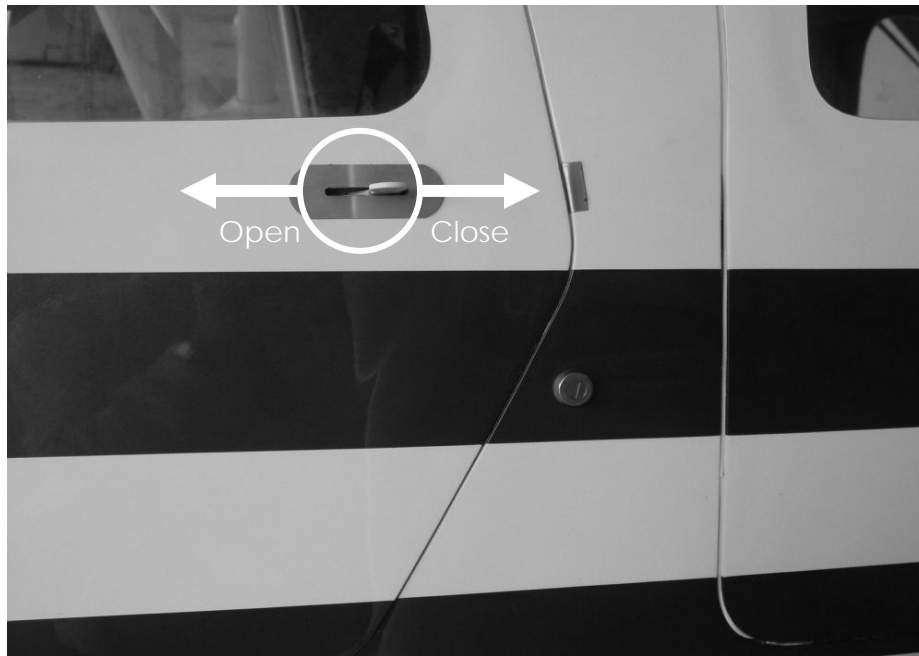


Figure 10-5: External Door Latch

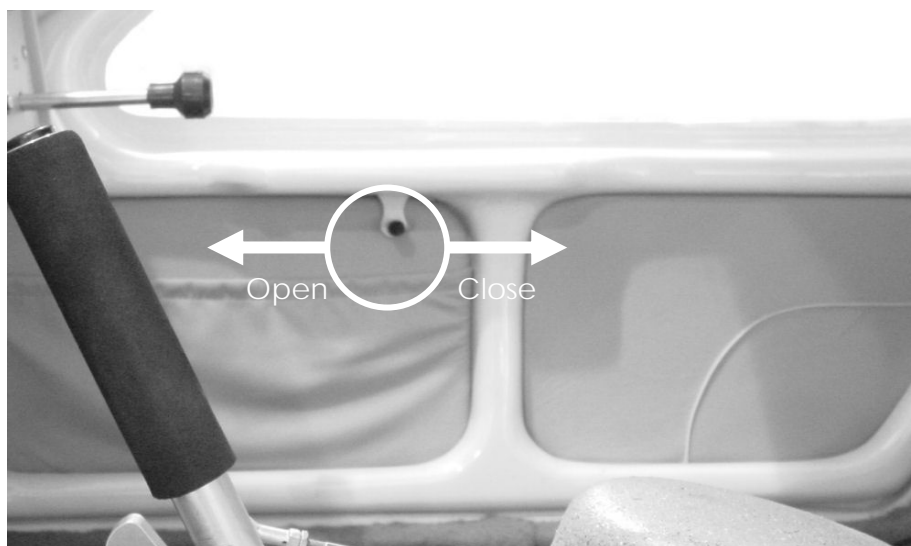


Figure 10-6: Internal Door Latch—Old Style

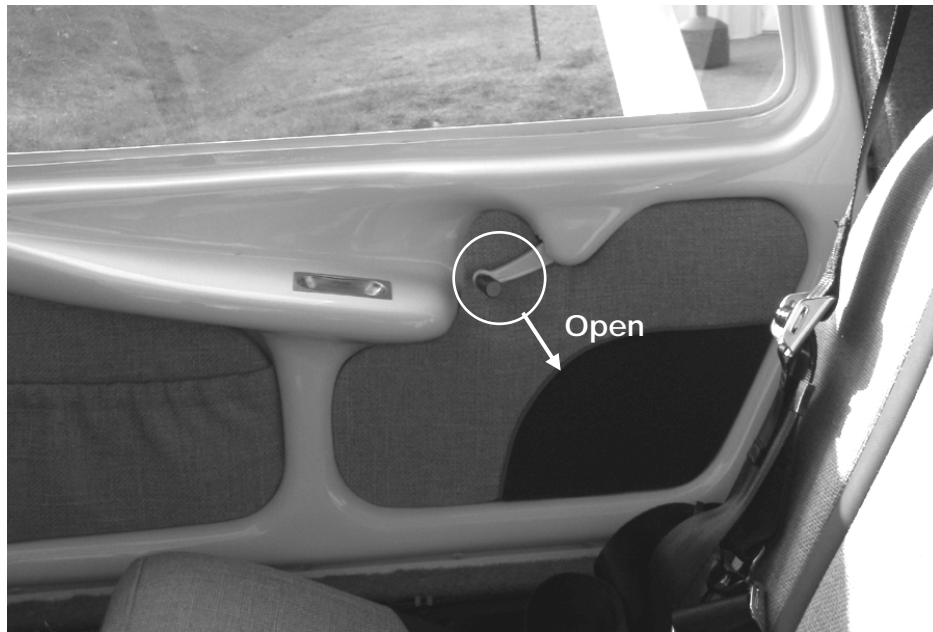


Figure 10-7: New style J230 Door Latch

COCKPIT ENTRY AND EGRESS

The height of the J230-SP cockpit with respect to the ground makes entry and egress very easy. The recommended approach for entry into the cockpit consists of sitting on the door rail and seat area, sliding back into the seat, and lifting legs up and around into the cockpit floorboard area. The recommended egress method is opposite the entry method. Taller pilots may benefit from putting their right foot in first, followed by their head, then sitting on the seat and bringing in the left foot. Avoid leaning on the doors during entry and egress.

10.4 Transition Training Guidelines

This section is presented to familiarize new Jabiru pilots and their flight instructors with the basic operating knowledge and flight characteristics of the J230. It is an outline of subject matter and flight exercises that have been proven to be useful during training in Jabiru aircraft. Keep in mind that during transition training in any light-sport aircraft, pilots with previous flight experience are often used to flying heavier aircraft with different handling characteristics. No matter how much flight time a pilot has accumulated over the years, a comprehensive session of dual instruction with a flight instructor who is experienced in the Jabiru will go a long way toward safety and a pleasurable transition into light-sport aviation.

Insurance companies may require anywhere from one to five hours or more of flight training, including a specified number of landings, with a qualified CFI. New Jabiru pilots should check their insurance policy for specific transition training requirements before solo flight.

Lesson 1: Aircraft Familiarization

Ground, 0.5 hour

Using the Preflight Checklist in the Pilot's Operating Handbook (POH) as a guide, conduct a detailed preflight of the aircraft and explain the controls and systems.

Lesson 2: Instruments and Avionics Overview

Ground, 0.5 hour

Sit in the cockpit and discuss the flight instruments and avionics. If a power source is available, connect the trickle charger to the aircraft battery and turn on the Master and Instrument switches for a detailed and interactive lesson. Open the hangar doors or park the aircraft outside for full GPS functionality. The EFIS and electronics are capable of many functions, but focus Lesson 2 on what the pilot *needs* to know to safely fly the airplane.

1. Engine Information System (EIS)
 - a. Default Screen—RPM, Oil Temp, Oil Pressure
 - b. Other screens—CHT, EGT, flight timer, OAT
 - c. Resetting Fuel Totalizer, if equipped

2. EFIS—Primary Flight Display
 - a. Startup—AHRS alignment
 - b. Primary Flight Instruments
 - c. Airspeed
 - d. Altitude
 - e. Vertical Speed
 - f. Heading
 - g. Attitude Indicator
 - h. Distance from waypoint
 - i. Display choices—PFD with Map or Engine information
3. EFIS—Multifunction Display
 - a. Map choices
 - b. Engine information screen
 - c. Brief tutorial on entering Direct To waypoints and flight plans
4. Radio, Intercom, Transponder
 - a. Basic operation
 - b. Push-To-Talk switch location
 - c. Use of VOR (SL-30 only)

5. Autopilot (if installed)

a. ON/OFF controls

CFI Note: It is strongly recommended that the autopilot (A/P) circuit breaker be pulled during the first flight lessons to prevent inadvertent activation of the autopilot during dual flight instruction in the traffic pattern.

6. 406 MHz ELT

a. Registration and operation

Lesson 3: Flight Briefing

Ground, 0.5 hour

1. Flight Planning Considerations

- a. Operating limitations
- b. Weight and balance
- c. Performance

CFI Note: Consider home environment of pilot in transition, i.e. mountains, short runway, grass runway, etc.

- i. Takeoff/Landing distance
- ii. Climb
- iii. Effect of density altitude
- iv. Cross-country fuel planning

2. Aircraft operation speeds and handling

a. Review important airspeeds:

- i. Lift-off
- ii. Climb
- iii. Maximum flap extension speed
- iv. Stall speed, flaps up and flaps down
- v. Approach speeds
- vi. Maneuvering speed
- vii. Never-Exceed speed

3. Flight Control Technique

a. Direct-link nose wheel steering

- i. Takeoff technique
- ii. "Soft feet" during landing—make sure rudder pedals are straight before allowing nose wheel to contact runway surface

b. Go-around Procedure

c. Review: Jabiru vs. other aircraft flown by pilot-in-transition

4. Training Airport Environment

a. Briefing on traffic pattern altitude, runway lengths, frequencies, etc.

b. Emergency briefing—local safe landing zones

5. PIC Briefing

- a. Positive exchange of flight controls

Lesson 4: Basic Flight Maneuvers

Flight—1.0 hour

Practice basic flight maneuvers, followed by several landing approaches to an altitude deemed safe by the flight instructor. Pilots in transition should not be allowed to take off or land until they are able to fly a stabilized descent, pattern and approach.

1. Ground Handling

- a. Demonstrate proper ground handling techniques

2. Engine Start and Warmup

- a. Proper engine starting technique including use of choke
- b. AHRS alignment and instrument setup (altimeter setting, radios, etc.)

3. Taxi Technique

- a. Direct-link nose wheel steering
- b. Control stick placement during taxi/braking
- c. Use of hand brake

4. Basic flight maneuvers

- a. Straight and level with use of trim
- b. Climbs at V_X and V_Y
- c. Descents
- d. Turns
 - i. Shallow turns—rudder coordination exercises
 - ii. Steep turns—45 to 60 degrees of bank
- e. Combinations of the above

CFI Note: When a transitioning pilot attempts to turn with inadequate rudder input or aileron and elevator only, the initial reaction of the aircraft will be to yaw opposite the direction of bank. The proper technique when making turns in a Jabiru is to lead the turn with slight rudder pressure in the direction of the turn immediately prior to banking. When established in the turn, neutralize aileron and rudder, but maintain slight back pressure as needed. This will create a crisp, smoothly coordinated, banked turn. During cruise flight, if one wing is slightly low, apply slight rudder pressure (big toe pressure) into the bank and release to return the aircraft to coordinated flight.

5. Slow Flight

- a. Flaps UP at 70 KIAS
- b. Flaps UP at 65 KIAS

- c. Flaps DOWN at 60 KIAS
- d. Flaps DOWN at 55 KIAS
- e. Up to 30 degree bank turns in various flap/airspeed configurations.
- f. Proper transition from slow-flight to cruise climb (Same as a go-around recovery)
- g. Note aileron effectiveness and controllability throughout the slow-flight exercise.
- h. Note need for increased rudder input at high power setting and high angle of attack.

6. Stalls

CFI Note: Stalls in a Jabiru are forgiving, with very little apparent "break." Full stalls are most often recognizable by a slight buffet and increased rate of descent, with the nose in a near-level or upward attitude. If the aircraft is kept in a coordinated condition, it will stay in a level descent. If it slips or skids to one side, one wing may drop and the aircraft may turn. To recover from a stall, simply release elevator back pressure to reduce the wings' angle of attack, and smoothly add power as necessary.

When loaded properly, the aircraft is difficult to spin; if aggravated to the point of a spin, level flight is recoverable using standard spin recovery technique. Intentional spins are not authorized.

- a. Power on (2500 rpm), flaps up-- to stall buffet only
 - b. Power off, flaps up-- to buffet only
 - c. Power off, flaps down --to buffet only
 - d. Power on (2500 rpm), flaps up-- full stall
 - e. Power off, flaps up-- full stall
 - f. Power off, flaps down-- full stall
7. Approach Configuration with Sideslips
- a. At a safe altitude, pull power to idle and set up simulated landing approach
 - b. Practice sideslips left and right, with and without flaps; note rate of descent

8. Cruise Flight

CFI Note: The Cruise segment of the lesson is meant to give the transitioning pilot a short break from maneuvering and for the CFI to demonstrate proper use of power and trim, flight plan usage, and use of the autopilot, if installed. Other nav functions (VOR, ILS, synthetic approach) may be demonstrated at the discretion of the CFI and transitioning pilot.

- a. Power and trim settings for cruise
- b. Proper use of autopilot

c. Entering and using GPS flight plans

9. Normal Approach

CFI NOTE: The first several trips around the pattern should be planned low approaches, with a go-around planned between 25 and 50 feet AGL, to allow the transitioning pilot to practice airspeed control and aircraft handling low to the ground. Pilots should have good stabilized approaches and consistent approach speeds on short final between 60 and 65 KIAS before being allowed to land. This is in a no wind situation—approach speed at instructors discretion in windy conditions.

- a. 80-90 KIAS on downwind
 - b. Abeam touchdown point, reduce power to 1500 rpm
 - c. Carb heat-- out
 - d. Slow to 80 KIAS, 10 degrees flaps
 - e. Trim for 70 KIAS
 - f. 70 KIAS on base, 20 degrees flaps
 - g. Power IDLE, 60-65 KIAS on final
 - h. 60-65 KIAS short final, 20-30 degrees flaps
- ## 10. Go-around procedure

- a. Smoothly advance to full throttle while pinning nose to horizon and adding right rudder for torque
- b. Level wings, establish safe airspeed and climb away from ground
- c. Clean up carb heat, trim and flaps when at safe altitude

Lesson 5: Normal Takeoffs and Landings

Flight, 1.0 hour or more

This lesson should be done after the transitioning pilot demonstrates the ability to fly stabilized descents, approaches, and go-arounds. This lesson may be extended into several hour-long sessions, depending on pilot skill level and insurance requirements.

1. Normal takeoff
 - a. Advance throttle to full power.
 - b. Smoothly apply elevator back pressure to raise the nose level with the horizon and let the aircraft accelerate.
 - c. Climb out at 75-80 KIAS once established.

CFI NOTE: The technique for a smooth takeoff in the Jabiru is similar to traditional soft-field technique. The

nose wheel should be raised slightly above the runway surface early in the takeoff roll. As the airspeed increases, the elevator will become more effective, and back pressure must be slowly relaxed so the top of the cowl stays approximately even with the horizon (sight picture will vary with pilot height). With the nose wheel in the air, the pilot is free to apply as much rudder compensation as needed to maintain runway centerline due to torque and any crosswind that may exist. When the aircraft reaches flying speed with the nose "pinned to the horizon," it will lift off the runway on its own with no further "rotation" needed. See Lesson 6 for notes on crosswind takeoffs. The pilot-in-training has mastered the takeoff roll when he or she is able to smoothly coordinate pitch and yaw control for a stable liftoff while reasonably maintaining runway centerline and compensating for wind drift.

2. Normal Landing

- a. Fly the traffic pattern as practiced in Lesson 4.
- b. Stabilized approach speed 60-65 KIAS on short final
- c. Power to idle over the numbers
- d. Land on the mains, at or near stall speed.
- e. Hold nose wheel off the ground as long as possible.

f. Brake as required. Brake should not be applied until nose wheel is on the ground.

CFI NOTE: During transition training, bounces, flaring too high, and crooked landings are common problems. ALWAYS be ready for a go-around. The aircraft will climb away from the ground with flaps and trim in landing configuration when full power is applied, nose is brought level with the horizon, and wings are leveled. (It will be necessary to apply forward pressure to the stick to maintain a safe pitch attitude at full power with landing flaps and full aft trim.) Do not attempt to salvage bounced or crooked landings until the pilot in training has made several successful normal landings and feels comfortable with the aircraft.

WHEN IN DOUBT, GO AROUND!!

Normal landings are very traditional in the Jabiru. However, pilots need to be aware of rudder pedal deflection at the point of nose wheel contact with the runway. The term "soft feet" has been coined by Jabiru transition instructors as a reminder that upon touchdown of the main wheels, rudder input must be relaxed to allow the nose wheel to straighten when contacting the runway. This is particularly important in crosswind landing scenarios where the pilot lands in a sideslipped configuration. See Lesson 6 for more information about crosswind technique.

The hand brake is very effective, but different for many transitioning pilots who are used to toe brakes. With practice, pilots should allow the aircraft to slow to a safe taxi speed, roll the stick to one side with their right forearm, and smoothly apply brake as necessary with their right hand. The Y-stick (training stick) makes this easy, as the pilot can simply reach through the Y arms and apply brakes.

Lesson 6: Crosswind, Short/Soft Field Operations

Flight: 1.0 hour

When the transitioning pilot has mastered normal takeoffs and landings, it's time to practice short field, soft field and crosswind landings (as conditions allow).

1. Short field takeoff

- a. Hold brakes in takeoff position until engine reaches full power, then release brakes.
- b. Pitch for horizon and let the aircraft accelerate until it lifts off.
- c. Climb at 65 KIAS until clear of obstacle.
- d. At safe altitude, accelerate to 75 KIAS, retract flaps, then accelerate to 85 KIAS.

2. Soft field takeoff

- a. Same procedure as Normal takeoff.

- b. Take care to keep as much weight off the nose wheel as possible during simulated soft-field taxi operations.

3. Short field landing

- a. Same approach as Normal landing.
- b. Use full flaps if conditions allow.
- c. Touchdown on main wheels.
- d. Gently but firmly lower nose wheel.
- e. Retract flaps to unload wings while braking as needed.

4. Soft field landing

- a. Same approach as Normal landing.
- b. Touchdown softly on the mains.
- c. Hold nose wheel off landing surface as long as possible after touchdown.
- d. Use minimum braking required.

5. Crosswind Takeoff

CFI Note: In strong crosswind situations, it may be necessary to keep the nose wheel on the runway until lift-off speed, then pull the airplane off the runway "positively and smoothly" to avoid settling back onto the ground. In this situation, be ready to apply rudder input immediately after liftoff to compensate for torque.

- a. Apply ailerons into the wind as necessary.
Remember to relax aileron pressure as
airspeed and aileron effectiveness
increase.
- b. Apply full power and allow the aircraft to
accelerate to 50-55 KIAS with the nose
wheel still on the ground.
- c. At 55 KIAS, apply enough elevator back
pressure to raise the nose to a lift-off
angle. As the aircraft lifts off, apply rudder
pressure as necessary to correct for
torque.
- d. Once clear of the ground, make a coordinated
turn into the wind to maintain desired
course.

6. Crosswind Landing

- a. Set up a normal approach, using the minimum
flap setting suitable for the landing
runway.
- b. The upwind-wing-low technique is
recommended for Jabiru aircraft. Maintain
aileron pressure into the wind while
holding runway centerline with rudder.
- c. Touch down on the upwind main wheel first.

- d. Firm rudder pressure must be removed before allowing the nose wheel to contact the runway surface.
- e. Maintain directional control using nose wheel steering.

CFI Note: Upon touchdown of the main wheels, rudder input must be relaxed to allow the nose wheel to straighten when contacting the runway. This is particularly important in crosswind landing scenarios where the pilot lands in a side slipped configuration. If the pilot is holding firm rudder input when the nose wheel touches the runway surface, the aircraft will yaw in the direction of rudder deflection. In strong crosswinds, the pilot should straighten the nose wheel upon touchdown of the mains and gently but firmly lower the nose wheel to the ground to maintain positive directional steering control.

Lesson 7: Emergency Scenarios

Flight: 1.0 hour

In all situations regarding emergency procedures, some of the most important things to remember are:

- ALWAYS FLY THE AIRCRAFT.
- Do not try to save the aircraft. Having to trailer an aircraft out of a field is much better than trying to

make it to the airport and coming up short in a forest or neighborhood.

- Your responsibility is to you and your passenger. When that responsibility is accounted for, then you can think about salvaging the airplane.
- Insurance is a wonderful thing.

1. Basic Emergency Approach and Landing

- a. Key Position-- position from which you can assure a power off approach and landing to the desired runway or field. Normally this is a point abeam the touchdown area at about 1000'-1500' AGL.
- b. Fly the aircraft to the key position on the downwind leg of the traffic pattern.
- c. Reduce power to idle and apply carburetor heat.
- d. Fly approach using normal airspeeds, adjusting pattern for sink rate and wind drift.
- e. Deploy flaps and/or sideslip as necessary to adjust glide angle.

- f. Touch down within first one-third of runway (spot landing, i.e. 1000-foot markers, at CFI discretion).
- g. Exercise is complete when pilot in training can accomplish a safe landing without over- or undershooting the landing area. **WHEN IN DOUBT, GO AROUND!**

CFI Note: By the end of the training course, the pilot in transition should be able to land the aircraft safely on the first one-third of the runway from the downwind leg with simulated engine failure (power at idle). At CFI discretion, additional exercises may be accomplished in accordance with the emergency procedures in the POH:

2. Power off gliding practice

- a. Best glide distance with flaps UP -- 70 KIAS
- b. Recommended glide with flaps 30°—65 KIAS
- c. Practice the above to get an idea of the minimum sink that can be achieved with various speeds and flap settings.

3. Emergency scenarios

- a. Refer to the POH for emergency procedures.

Lesson 8: Review

Ground, 0.5 hour or as needed

At the completion of training, review topics at the discretion of the transitioning pilot and the CFI.