Testing>Flight testing

Objectives of this task:

To safely and successfully test fly the aircraft, record information resulting from the flight test sequence and use that information to fine tune the flying characteristics of the aircraft.
Well, this is what it all comes down to: you have built your own Jabiru, you have painted it and assembled it and checked and tested every part of it to your satisfaction and now it is time to finish the project and actually fly the machine for the first time!
This is no small undertaking, and you must ask yourself if you are capable of performing the flight test on your own, or, perhaps, if your experience level or recency is low, you may wish to hire a more experienced pilot to conduct some or all of the flight testing for you.
This task will step you through each of the flight testing stages that we employ here in our factory testing program, along with the appropriate forms to record the results of each stage.
The correct sequence for rectifying any out of rig conditions will be explained along the way.

Reference documentation

The Australian Civil Aviation Safety Authority (CASA) produces a "Flight Test Guide for Certification of CAO 101.28 Category Airplanes". This document is required to be completed as part of the approval process for Australian-built aircraft.
In countries other than Australia, the amateur builder should seek advice from the appropriate Airworthiness Authority and/or the relevant amateur building association (EAA Chapter or equivalent) as regards their requirements.
In the USA the FAA publishes the "Amateur-Built Aircraft and Ultralight Flight Testing Handbook" (publication AC90-89A), which addresses the topic in considerable detail and which may be obtained here: www.faa.gov/library/manuals/

Sequence

This task will address the following steps:

- Preliminary work
    - Airport selection
    - Emergency plans and equipment
    - The test pilot
- Sequence #1: Ground runs
    - Engine parameters
    - Taxi testing
- Sequence #2: Initial flight and function testing
    - First flight, rigging checks
    - Rigging corrections
- Sequence #3: Performance flight testing

Airfield selection

Airfield selection will play a very important role in your testing and you should approach your choice of airfield with considerable care. The nearest flat piece of land may not necessarily be the best or safest place and you may have to consider transporting your new Jabiru by road to a suitable airfield for the flight testing sequence.
The ideal airfield would be at or near sea level with a runway of at least 1000 metres length (for every 1000 feet increase in elevation add 200 metres to the length required) in an area that is relatively flat with few obstructions near the airfield. Ideally there should not be many buildings surrounding the airfield and there should be enough open space around the airfield to allow for the possibility of an out landing.
The test pilot should familiarise himself with the surrounding area from the air with particular regard to suitable landing areas for emergency use before starting the testing sequence.

Emergency plans and equipment

Before any testing can begin you must have a plan in place to deal with emergency situations. You must address what actions to take if it all goes badly and an accident happens and know the local emergency telephone numbers.

A SUPPORT CREW OF 2 SUITABLY EXPERIENCED PEOPLE WILL BE REQUIRED TO SUPPORT THE FLIGHT TESTING SEQUENCES AND ASSIST THE TEST PILOT WITH REFUELLING AND CHECKING THE AIRCRAFT.

The following details the bare minimum requirements, to which you may wish to add your own items:

The GROUND emergency plan

All crew (pilot and ground crew) should know how to:

- Open the cabin doors
- Release the pilots harness/seat belt
- Locate and turn off the fuel valve
- Locate and turn off the Master switch and the magneto switches
- Remove the cowling and disconnect the battery for fire fighting purposes

The IN-FLIGHT emergency plan

The pilot will need to consider his response to the following:

- Complete or partial engine failure, particularly shortly after takeoff
- Flight control problems including severe out of rig conditions
- Fire in the engine compartment or cockpit

Equipment

The pilot should carry a CO2 detector in the cockpit at all times during all flight testing.
The crew should have access to a dry powder fire extinguisher.
There should be 2-way radio communication between the pilot and the support crew at all times as well as any radio communication required by local regulations. Most Jabiru aircraft will have a VHF radio installed, and if the support crew have a hand-held VHF radio then a discreet frequency can be used to communicate during the test flight sequence.

The test pilot

Flight testing must only be carried out by a suitably qualified and experienced test pilot.
Test flying any newly built aircraft is risky. For example, minor changes to aircraft rigging can significantly alter stall behaviour, leading to extreme wing drops or spinning. Test pilots must be aware of this and all other potential risks and be suitably skilled to recover control of the aircraft from extreme and unusual attitudes.
The Test Sequence in this task is based on the Test Schedule used by Jabiru Aircraft on factory-built models and is supplied as reference material as a part of the construction data for this kit. Several of the manoeuvres required by this schedule will result in extreme aircraft attitudes and carry an increased risk of spinning or other undesirable aircraft behaviour. Pilots choosing to follow the Jabiru Aircraft Test Sequence do so at their own risk.

Recency

In particular, the test pilot should have a recently demonstrated ability to:

- Deal with an engine failure at low altitude (~200ft) after takeoff
- Recover from stalls in level flight and in banked turns
- Recover from a spin
- Recover from unusual attitudes (including a spiral dive)
- Carry out a flapless landing
- Carry out a glide approach and landing

Medical considerations

The test pilot should be in good health and should abide by the following conditions:

- Should not have a head cold or any current sinus problems
- Have had no local or dental anaesthetics for at least 48 hours prior to test flying
- Alcohol: an absolute minimum of 24 hours, preferably longer, must have elapsed between the last consumption of alcohol and any test flying
- Should not have donated blood for at least 3 weeks prior to test flying

Clothing

The test pilot should consider the possibility of an in-flight fire and dress accordingly:

- Dress ONLY in natural fibres and do NOT wear any synthetic materials
- Long pants and long sleeves – no bare skin should be exposed
- Nomex gloves for hand protection (most pilot supplies shops carry these)

Checklists

The test pilot should be completely familiar with the normal and emergency checklists in the Owners Manual and should commit to memory the critical airspeeds that are specified in the Owners Manual.
It may be useful to write these speeds down and tape them to the instrument panel for ease of reference in flight.

Sequence #1 – First start, ground run and taxi

Print and use the Flight Testing form *Sequence #1* for this sequence.
Locate the aircraft on a suitable run-up area with no gravel or small stones in the area under the propeller, point the nose of the aircraft into wind and chock the main wheels.

Pre start

Remove the upper cowling and set it aside. Remove the spark plugs, turn the Master switch ON and leave both magneto switches OFF. Press the starter button and allow the engine to crank over. Watch the *Engine Oil Pressure* (EOP) gauge for the first indication of oil pressure. Stop cranking once oil pressure is seen. Refit the spark plugs and upper cowling.

Start

Turn both magneto switches ON and pull the choke ON. Turn the fuel tap ON, turn the fuel pump ON and listen for its operation for 10 seconds. Turn the fuel pump OFF.
Press the starter button; listen for the click of the solenoid, and the winding of the starter motor. The engine should start within a few revolutions, usually as soon as fuel reaches the carburettor. Listen for the sound of the starter motor disengaging after engine start.
Watch the EOP and if it does not rise in the first 10 seconds after starting shut the engine down and call the mechanic. The EOP range should be from 220 to 525 kPa.

Idle condition

The idle should be smooth and may be up to 1400 rpm with the choke on, and up to 900-950 rpm with the choke off. Note that the requirement for choke will vary with OAT. Check the *Engine Oil Temperature* (EOT), it should rise slowly and steadily to 50 – 60 °C, and the *Cylinder Head Temperature* (CHT) should rise to 85 – 105 °C. The *Exhaust Gas Temperature* (EGT) gauge (if fitted) should read between 425 – 485 °C.
Once the engine has warmed (EOT 50°C or more) then you may proceed, but before you do the idle speed must be adjusted correctly in accordance with the procedure in the next step.

Idle speed adjustment

Once the engine has been warmed to operating temperature then the idle speed must be adjusted before proceeding. This idle speed adjustment procedure will require 2 people: one inside the cabin operating the engine and one adjusting the idle stop on the carburettor.
Stop the engine by turning both Mag switches to the OFF position. If the engine will not stop it means that a Mag earth wire is not correctly connected – in this event stop the engine by turning the fuel tap OFF and waiting until the engine stops. Connect the earth wire before re-starting the engine.
Remove the upper cowling and set it aside. The Pilot side throttle input shaft has 2 alloy collars while the Co-Pilot side has 1 collar. Loosen all 3 collars with an Allen key, working through the holes in each side of the instrument panel housing. Start the engine and adjust the idle stop on the carburettor until the engine idles at 900 rpm. Stay well clear of the propeller!
Adjust the collars on the input shafts so that when the engine is at idle the collars on each input shaft are just touching the back of the input shaft pivot block. Lock each idle collar in place. With the engine turned OFF push both input shafts to full throttle and adjust the Pilot side collar so that it is just touching the other side of the pivot block and lock it in place.
Re-test the idle and make any further adjustments required. Replace the upper cowling.

Run up and full power check

Re-start the engine and smoothly increase the engine speed to 2000 rpm. Check that all temperatures and pressures are in the green part of the range.

Check each magneto individually: the maximum permissible rpm drop is 200 rpm but it is typically much less. If an rpm drop of more than 100 rpm occurs on either magneto, shut the engine down and call for the mechanic.

Still at 2000 rpm apply carburettor heat: the maximum permissible rpm drop is 100 rpm but it is typically much less. Check that all temperatures and pressures are still in the green.

Advance the throttle until it is fully open: the engine should not falter or surge during this operation. Record the maximum sustained static speed (2975 – 3050 rpm); wait for 60 seconds and then record the EOP, EOT, CHT and EGT (if fitted). Limit the full power segment of the ground run to less than 2 minutes total time.

Bring the engine smoothly back 1200 rpm for a minute or 2 and then back to idle.

Engine shutdown

Allow the engine to return to idle: the idle should be smooth at 900 rpm. Turn both magneto switches OFF and the engine should stop smoothly.

Turn the Master switch OFF.

Remove the cowling and check for any leaks of oil or fuel. Correct as required before proceeding with the testing sequence.

Taxi tests

Re-start the engine and taxi to the movement area or ramp with your headset off.

Listen for and note:

- Airframe sounds
- Electric fuel pump functioning
- Suspension movement
- Doors and windscreen structure movement
- Wheel bearings and brakes
- Tyres rubbing on the wheel spats (if fitted)
- Steering: should steer positively

Approaching the movement area or ramp cut the engine.

Check that the aircraft rolls freely without brake drag. At a slow speed and without your feet on the rudder pedals apply the brakes firmly, the brakes should pull straight and the aircraft should stop abruptly.

Any brake binding or wheel rubbing issues should be rectified before the first flight.

Restart the engine.

On the movement area or ramp check the turning circle (left and right turns). The radius of the left and right turns should be the same.

Face into and taxi into wind. The aircraft should track straight with feet off the rudder pedals.

Compass swing

While you are out in the run-up area and provided that the ground run has gone well, this would be a good time for a compass swing before you start the actual test flying.

You will need assistance to turn the aircraft accurately onto headings and your ground crew can help you with this. You'll need a small, brass, non-magnetic screwdriver and ideally an airport with a compass rose: a compass rose is a pattern painted on the ground, which accurately depicts magnetic headings. If your local airport doesn't have one you can make your own using the known magnetic orientation of the runways at an airport or a 'known good' hand held reference compass with an alignment sight.
Be careful with this approach though, just because a runway is marked "14" doesn't mean it is oriented at 140º, it might actually be oriented 144º or 138º. Check with your local airport operator to get the precise orientation. A hand held reference compass is usually preferable.
Remove all metal objects from your person and the aircraft before you start and make sure that the selected area has no nearby metal structures that could affect the magnetic compass.
For the test the aircraft should be configured as it would be for flight, with the engine running and all avionics and Nav and strobe lights turned on. Try some test transmissions with your VHF comms to see if transmissions affect the compass in any way.
Under the compass' display window are 2 screws that are used to compensate for instrument errors, one for North South adjustments and the other for East West adjustments.
Position the aircraft at a known North heading using a compass rose or a reference compass.

1. With the aircraft oriented North, the engine running, and all radios switched on, adjust the N-S adjusting screw until the compass reads due North, or 0º.
2. Rotate the aircraft to a known East heading, and use the E-W adjusting screw to make the compass read due East, or 90º.
3. Rotate the aircraft to a known South heading. Note how many degrees off South the compass reads. Turn the N-S adjusting screw to remove one half of the error.
4. Rotate the aircraft to a known West heading. Note how many degrees off West the compass reads. Adjust the E-W adjusting screw to remove one half of the error.
5. Rotate the aircraft through the N, E, S and W headings again, confirming that the errors for North and South are the same, and the errors for East and West are the same.
   You may want to repeat steps 1-4 to fine-tune the corrections.
6. Now rotate the aircraft from North, stopping at each 30º point on the compass rose or reference compass (e.g., 030, 060, 090, 120, 150, 180, 210, 240, 270, 300, and 330 degrees) and make a note of the actual aircraft compass reading compared to the compass rose or reference compass at each point, then complete the compass calibration card that was packed with your compass, which you should then mount in the holder on the front of the compass for reference.

If you cannot get a usable set of readings you will need to locate any sources of magnetic interference. Look for steel screws, washers or other components near the compass. You should also experiment with aircraft electrical systems (lights, for example), to see whether activation of that equipment causes the compass to misbehave.
The compass should be re-swung after any significant changes to the panel or engine bay and at least once every 2 years.

Sequence #2 – First flight and rigging tests

Pre-flight

Print and use the Flight Testing form *Sequence #2* for each test flight in this sequence.

Recording

Use a kneeboard or clipboard to hold the Flight Test forms and record details of each test flight, however the first priority must always be to *fly the aircraft* so write things down **only** when it is safe to do so.

Loading

Load the aircraft with the test pilot and 20 litres of fuel in each wing tank.
If you have followed the instructions in the *Testing>Calibrate fuel gauges* task you should already have 20 litres per side at this point, if not then drain or add fuel as required.

Engine Start and Run-up

Start the engine normally, taxi to the run-up area and perform an engine run-up.
Check temperatures and pressures and make sure that the idle is correct when the engine is warm – it should idle at around 900 rpm.

Pre-take off Checks

Record the date and engine hours as well as the wind direction and strength, the OAT, the Runway in use and the Pressure Altitude. Set the altimeter back to the local QNH.
Check controls for full and free movement and correct sense – see each control surface movement. Any sense of controls binding **must** be addressed before proceeding.
Listen for traffic and wait for the traffic to clear for first flight. Carry out the pre-takeoff checks specified in the Owners Manual.
Advise all traffic that a first flight is to be conducted.

Flight testing

Takeoff and climb

Use the full length of the available runway, which should be into wind.
Apply full power in a positive manner over a count of 4.
Check engine rpm indication and ASI function on the roll and abort if either is incorrect.
Immediately after takeoff check instruments and LISTEN, FEEL and SMELL and if in any doubt abort and land on the remaining runway, otherwise proceed.
Climb at full power at 80 KIAS while remaining over the airfield: remain within gliding distance of the airfield at all times on the first flight: plan your climb carefully so that you are always within reach of the field should the engine fail. This may require an initial turn at less than 500 ft AGL depending on the layout of the airfield.
Monitor the engine gauges carefully while climbing and note any tendency towards overheating. If temperatures get near to the top of the green range, increase airspeed to 90 KIAS to improve the cooling airflow. If the temperatures are still too high, reduce power slightly. Be particularly alert when you reduce the power for the first time.
At 3,000 ft above the airfield reduce the power to 2800 rpm, trim the aircraft for straight and level flight and check the rigging of the aircraft.

Rigging tests

If the aircraft flies straight with the ball in the centre and the rudder pedals are level the rigging is correct. There are 4 steps or tests that must be made:

1. If the aircraft flies straight with the ball in the centre but with the rudder pedals displaced then the pushrods that connect the rudder pedals to the steering yoke need adjusting.
2. If the aircraft flies straight but requires pressure on one rudder pedal to keep the ball in the centre then the rudder cable needs adjusting.
   If the ball is centred and the rudder pedals are level but the aircraft tends to roll or turn then the flaps may need adjustment. Check the stall before making any changes to the flaps.
   Slow the aircraft to near the point of stall in a clean configuration at idle power with the ball centred and note any tendency to roll just *before* the point of stall. If this happens then slow the aircraft to near the point of stall in a clean configuration several more times and note which wing drops just before the point of stall.
3. If the aircraft rolls just before the point of stall then the angle of incidence will need to be adjusted by means of the eccentric wing root bushes that are supplied with your kit.
   The correct installation procedure is explained later in this task.
4. If all flight up to the stall is wings level then the angle of incidence can be considered to be correct and any roll corrections can be made by individual adjustment of the flaps.

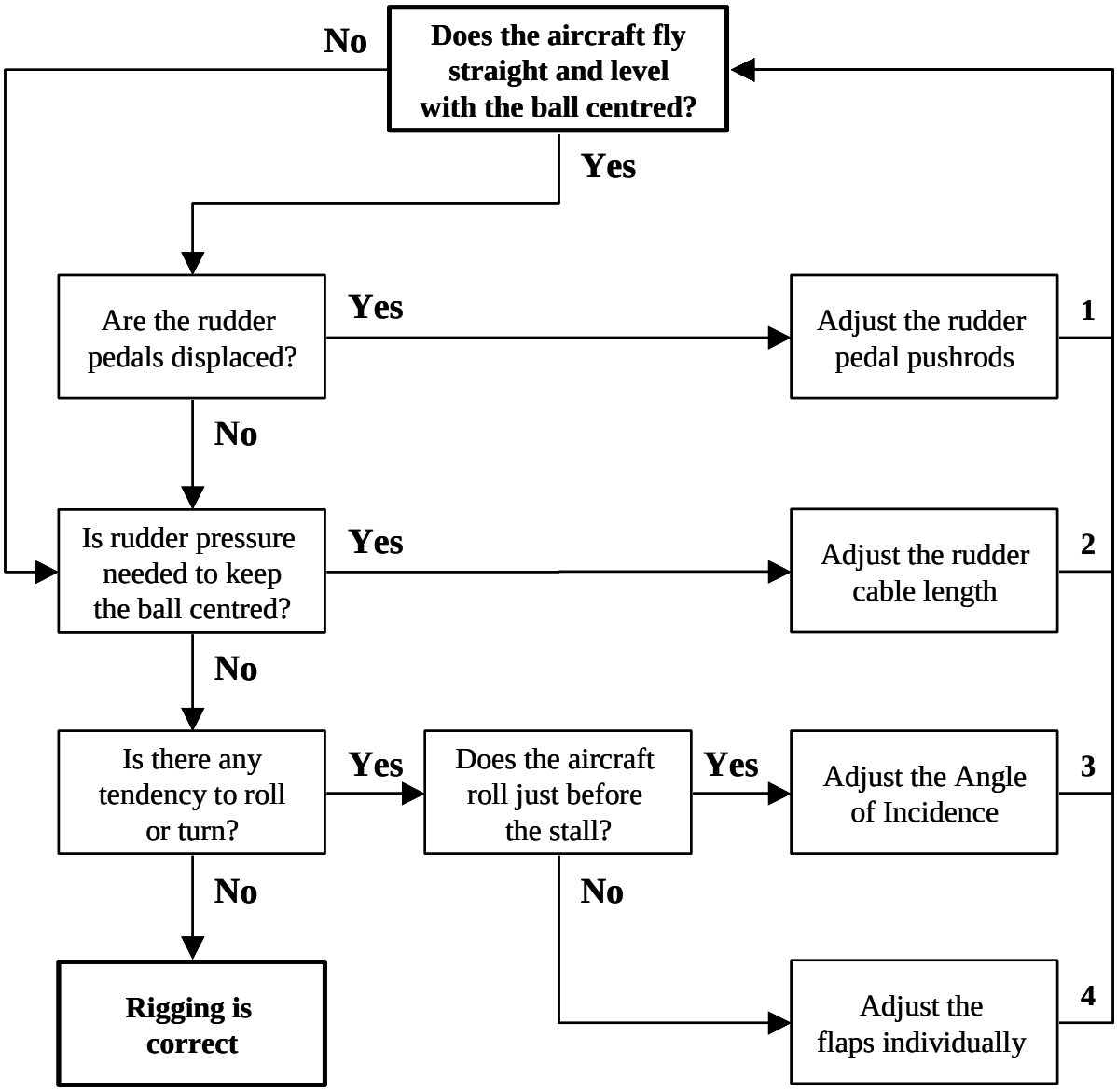
Slow the aircraft to V_{FE}, test the flaps at both half and full settings and then retract them.

Descent and landing

Descend to circuit height and conduct a normal approach and landing.
During the landing roll check that the undercarriage does not have any unusual noises, that the aircraft is easily controlled and that the brakes work evenly when applied.

Rigging corrective actions

It is particularly important that any rigging problems are dealt with in the correct sequence. Use the flowchart below to work your way through any rigging problems: it may be necessary to step through the flowchart more than once, but the sequence is very important so work through each line one at a time, making corrections as indicated and retesting each time until the rigging is correct.



Retest the aircraft after each adjustment has been made and keep working through the flowchart from line #1 all the way to line #4 until you reach the "Rigging is correct" box at the bottom left of the chart.

The Flight Testing form *Sequence #2* should be printed out and used to record information while in flight. Print one form per test flight and retain each as a permanent record.

1. Adjusting the Rudder Pedal Pushrods

If the rudder pedals are displaced fore and aft when the aircraft is in straight and level flight, adjust the rudder pedal pushrods that connect the rudder pedals to the steering yoke until the pedals sit level. Retest and adjust as required.

2. Adjusting the Rudder Cable

If pressure is required on one rudder pedal to keep the aircraft straight in straight and level flight: if pressure is required on the right pedal then the rudder cable must be shortened, while if pressure is required on the left pedal then the rudder cable must be lengthened.
To alter the length of the rudder cable the rod ends must be removed from the connecting bolts, the lock nuts must be loosened and each rod end must be moved and equal amount, either in or out. Note that the rudder pedal stops must be readjusted at the same time.
It is not possible to predict the amount of adjustment required as each case will be different, but as a general guide try moving each rod end one full turn for a total of 2 full turns (1 at each end of the cable) and then test fly that configuration to see if more or less adjustment is required. Take careful note of each change and the effect on the flying qualities of the aircraft.
Care **must** be taken: the threaded end of the rudder cable must always be visible through the safety hole in each rod end, the lock nuts must be tightened against each rod end and the Nyloc nuts on the connecting bolts should be replaced before each test flight.

3. Adjusting the Angle of Incidence (AoI)

Use this procedure **only** if the aircraft repeatedly rolls towards the same wing just before the point of stall in a clean configuration as explained earlier in this task. The wing that drops is stalling slightly ahead of the other wing and it will need to have its angle of incidence reduced by a small amount. You will need to fit the eccentric bushes to the wing that drops to decrease the Angle of Incidence by 0.4°, which will entail placing the offset hole in the front bush UP and the offset hole in the rear bush DOWN. This very small change will be all that is required. This procedure can be carried out without removing the wing from the aircraft.
Remove the wing root fairings. Chock the main wheels and support the outboard end of the wing. Remove the nuts from the wing root bolts and then very carefully tap each bolt out: as each bolt is removed, replace it with a length of stout wire of approximately 5mm thickness so that the wing root will not drop and damage the fuel lines or the side of the fuselage. Note carefully the position of the flat washers for reassembly.
Now the front wire can be removed and the wing can be slightly lifted so that the front bush is raised above the mounting lugs on the fuselage and the wing must then be held in this position by placing a bolt back through the front wing lug on the fuselage so that the wing lug can sit on the bolt. Take your time and make sure that the wing is unable to move or fall from this position by making sure that the outboard end of the wing is firmly supported fore and aft as well as underneath.
Heat the front bush with a soldering iron and remove it completely from the lug and clean away all of the flock from the bush mounting hole in the lug then tap the hole to 5/8” UNC in preparation for screwing in the eccentric bush.
It is very important that the tap be exactly square on to the lug and not angled in any way.
It may be necessary to remove a small amount of material from the leading edge at the wing root to allow a straight approach to the hole in the front lug when tapping the thread.
The wing root fairing will cover a small cutout here if it is required.

Test fit the eccentric bush into the wing lug dry, using a gently tapered object such as an old round file through the centre of the bush to screw the bush into the lug, ending when the bush is centred in the lug with offset hole facing UP to test the threads. Remove the bush.
Mix a very small batch of resin and separate it into 2 portions and then use one portion to coat the thread in the bush mounting hole in the wing lug and then coat the outside of the eccentric bush. Add flock to the other portion and apply a small amount to the bush and then screw the bush back into the lug, ending when the bush is centred in the lug with offset hole facing UP.
Wipe away all excess flock and lower the wing lug and bush back into the fuselage lugs and place the length of wire through the holes in the lugs and the bush.
Repeat the process for the rear bush, first test fitting the bush dry and then fitting it with resin and flock, but this time end with the offset hole in the bush facing DOWN.
Wipe away all excess flock and lower the wing lug and bush back into the fuselage lugs and hold in place with the wire. Leave the flock overnight to cure.
The next day fit the wing bolt though the lugs and the new bush. Refit the flat washers to the bolts as before. Remove the wire from the front bush and refit the wing bolt and flat washers.
Fit **new** Nyloc nuts to each wing bolt and tighten to safety. Do **not** reuse these nuts.
DO NOT OVERTIGHTEN THESE BOLTS. They should be just tight enough to prevent rotation. Over tightening may result in failure of the wing attach lugs.
Refit the wing root fairings. Retest the aircraft and, if required, make any small roll corrections by adjusting each flap individually.

4. Adjusting the Flaps

Use this procedure if the aircraft shows a tendency to roll in straight and level flight and *not* just before the point of stall in a clean configuration as mentioned in the previous step then minor adjustments may be made to each flap individually.
If the aircraft rolls to the left then the left flap may be lowered slightly, or the right flap may be raised slightly. If the aircraft rolls to the right then the right flap may be lowered slightly, or the left flap may be raised slightly.
Remove the wing root fairings as required to gain access to the flap pushrods. Remove the rod end connecting bolt from the drive yoke, loosen the lock nut and move the top rod end in or out and then refit the rod end to the drive yoke, tighten the lock nut. Refit the wing root fairings before each test flight.
It is not possible to predict the amount of adjustment required as each case will be different, but as a general guide try moving a rod end one full turn and then test fly that configuration to see if more or less adjustment is required. Take careful note of each change and the effect on the flying qualities of the aircraft.
If, for example, down adjustment becomes a problem on one flap then adjust the other flap up. If it becomes necessary to adjust the flap end of the pushrod, remove the flap to do so.
Care **must** be taken: the threaded end of the rod end must always be visible through the safety holes in each end of the pushrod, the rod end lock nuts must be tightened against each end of the pushrod and the Nyloc nut on the connecting bolt through the drive yoke should be replaced before each test flight.

Sequence #3 – Performance and handling

Print and use the Flight Testing form *Sequence #3* for each test flight in this sequence.
If all of the rigging corrections in *Sequence #2* have been done correctly and all equipment performs correctly then this sequence will usually only require one flight.
Record the date and engine hours as well as the wind direction and strength, the OAT, the Runway in use and the local QNH.

Loading rules

This Sequence is performed with either:

- Pilot weighing 100 Kg or less and 100 litres of fuel; or
- Pilot and 1 passenger for a combined weight of 172Kg or less and 50 litres of fuel.

Stalls

Climb at 80 KIAS using full power to 3000 feet AGL or higher, watching the engine instrumentation for any tendency towards overheating. If temperatures get near to the top of the green range increase airspeed to 90 KIAS improve the cooling airflow, and if temperatures are still too high then reduce power as required. Once established in a suitable test area, perhaps directly over the airfield, stall testing can start. During the course of the stall testing it will be necessary to climb back to the starting altitude from time to time.
The stalls are performed in the configurations listed on page 1 of the Flight Testing form *Sequence #3*.
Each stall is started from 60 KIAS and the aircraft is decelerated at a constant rate of 1 knot per second until the wing is fully stalled, which will require an increasing rearward rate of movement of the control stick.
Record the *Indicated Airspeed* (IAS) at which each stall occurs.
If anything out of the ordinary occurs during the stall testing phase record it in the Notes section at the end of the form.

Trim Speed Range

In the cruise configuration (2800-2900 rpm) record the trim speeds achieved at the full aft and full forward trim lever positions. Trim speed limitations are 50-65 KIAS in the aft trim position and 90-140 KIAS for the forward trim position.
In the approach configuration (full flap, engine at idle: 1000-1200 rpm) record the trim speeds achieved at the full aft and full forward trim lever positions. Trim speed limitations are: 60-70 KIAS in the aft trim position, and then trim forward until the airspeed reaches the end of the white arc (V_{FE}) on the ASI.

Glide at 62 KIAS

Retract the flaps, reduce the power to idle and trim the aircraft for a 62 KIAS glide.
Note the controllability and if the controls are rigged properly.

V_{NE}

Descend under power, typically 2700-2900 rpm, and approach V_{NE} in small speed increases.
Note any vibration or buffeting as well as the overall controllability of the aircraft.
Do not exceed V_{NE} under any circumstances.

Maximum Power Flight
Descend to 1000 feet AGL, set the altimeter subscale to 1013.2 hPa and record the Pressure Altitude and OAT.
With the engine at wide open throttle and the aircraft in straight and level flight, record the indicated airspeed and engine rpm and the EOP, EOT, CHT and EGT (if fitted).

Timed Climb
Set the aircraft up in the cruise configuration at 2800-2900 rpm. Record the Pressure Altitude, which will also be the start height, and the OAT.
With the engine at wide open throttle and the aircraft trimmed to 80 KIAS, record the time taken to climb 1000 ft, the indicated rate of climb, the engine rpm and the EOP, EOT, CHT and EGT (if fitted).
Set the altimeter subscale back to the local QNH that you recorded before takeoff.

General
Record your observations of the following:

- Lateral & Directional Control Rigging
- Lateral & Directional Rigging and Trim
- Lateral & Directional Stability and Control
- Longitudinal Static Stability

Equipment
Test and record the operation and performance of the VHF comm(s), the transponder (if fitted), the GPS (if fitted), all flight and engine instrumentation and any other fitted equipment such as strobe and Nav lighting or UHF comm.

Ground handling during and after landing
When landing check that the undercarriage does not have any unusual noises, that the aircraft is easily controlled on the runway and that the brakes work evenly when applied.

Post flight
Immediately after landing and securing the aircraft record your observations of the overall characteristics of the aircraft and it's systems as well as calculating the total engine hours and the fuel consumption rate.
When you are satisfied that the aircraft performs satisfactorily then this completes the *Testing>Flight testing* task and signals the end of this Manual as well.

The future
Congratulations, you have achieved something that most people can only dream about: you have built and flown your very own aircraft! This is a significant achievement and one that you can be justifiably proud of. Well done!
Please drop us a line here at Jabiru and tell us all about it, we would love to know.
We are sure that you will have many enjoyable hours of flying your very own Jabiru aircraft and we are equally sure that you will enjoy the low operating costs as well as the pleasurable flying characteristics that all Jabiru's share.