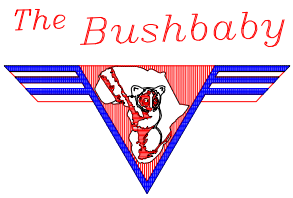


BUSHBABY AIRCRAFT

MANUAL

CONTENTS

INTRODUCTION AND GENERAL INFORMATION

PART 1: PREFACE

1. Congratulations on the purchase of your Bushbaby aircraft kit. You must be complimented on your good judgement and can be assured that you have not only purchased one of the most useful and exhilarating aircraft in the word, but also one that has proved itself with an unbeatable safety record. Our interest in you has not ended with the purchase of the kit, so you can rely on our assistance whenever needed.

2. After a few hundred hours of enjoyable construction time, your kit will be transformed into a brand new aircraft. If looked after, she will give you years of safe, economical and exciting service!

WARNING :	ALTHOUGH THE BUSHBABY IS A KIT AIRCRAFT, IT IS NEVER LESS AN AEROPLANE AND COULD BE DANGEROUS IF NOT PROPERLY BUILT, MAINTAINED AND USED.

3. Please do not be careless. Flying is a great thrill, but it is also utterly unforgiving of mistakes.

4. Be disciplined and do everything right from the beginning. Don't settle for anything less than the best. An old homebuilder saying goes: "DO NOT RUSH - THE SKY WILL BE THERE WHEN YOU ARE READY!"

5. This manual is designed to take you step-by-step through the entire building process with instructions, diagrams and pictures. If the manual is followed closely, there is no reason why you cannot accomplish the project and have a good aircraft. However, if you need assistance during the construction process, please give us a call.

6. Throughout the manuals there are information blocks (sample below). There are 3 types of blocks Warning, Note and Tip. The first is to alert the builder on crucial information, the second is for general information and the third is for building tips. Please pay heed to the information blocks.

WARNING :	IF IN DOUBT, DON'T IF STUMPED, FIRST CONTACT THE FACTORY OR A FELLOW BUILDER FOR ADVICE AND ASSISTANCE. DO NOT MAKE ANY STRUCTURAL CHANGES TO THE COMPONENTS OR AIRCRAFT

NOTE :	Remember the builder's e-group is an easy way to chat to us and all the other builders. Its nice to hear from you. Please send photos for our files and website.

PART 2: THE BUSHBABY, CAA AND YOU

1. A brief overview on how the Bushbaby aircraft/ kit got its SACAA “Type Acceptance Certificate”. This certificate is issued when an aircraft type has for filled all the SACAA engineering and legal requirements.

2. The bushbaby design was presented to the CAA who studied the design and then gave the go ahead to stat construction. After the first plane was built it was subjected to a static wing loading test. This test was witnessed by the SACAA. The plane was then issued with a 50 hour “Proving Flight Authority”. During this time various flight tests where conducted. After the 50 hours an “Authority to Fly “was issued. All design changes that where made, (many, over the years) first had to be submitted to the SACAA for approval before being implemented. The SACAA then issued the “Type Acceptance Certificate” for the aircraft and its components.

3. During this time the Manufacturing Organisation had to be approved by SACAA. This was done and KITPLANES for AFRICA is an SACAA recognised “Aircraft Manufacturing Organisation” KFA is audited annually and then reissued with a certificate.

4. The aircraft/ kit and components, that you have purchased have been SACAA approved. There are certain conditions to this approval.

- The aircraft/kit must be assembled as per manual, with the CAA approved parts
- The aircraft must pass the AP inspections. One of the questions on the inspection for is: Is the aircraft built according to manufacturers specifications!

5. If not built to the SACAA approved specifications, then the owner must apply for permission to incorporate the changes. This could mean supplying aeronautical engineering data.

6. The above excludes non-structural parts as upholstery, instrumentation, paints, wiring system etc.

7. At KFA we do appreciate any feedback that can make the plane easier to build and safer to fly. Many of the changes benefiting our later builders have come from previous builders,.

8. The whole idea of NTCA is that the builder may make alterations that suite him, so that the aircraft can for fill his specific needs. Unfortunately this does not mean he may make structural changes without informing the SACAA.

9. The above also applies to the fitting of spare parts latter on in the aircrafts life. Non factory parts are not allowed to be installed without SACAA permission. To point, a few years ago a builder landed hard and bent his wheel axle. He went to a local engineering firm and had new axles turned from axle steel so that the axles wouldn’t bend again. They didn’t bend again they sheared. The end result was a severely damaged aircraft and an expensive repair bill. The SACAA approved axles are made to bend under extreme loads, because if they shear the leg would stick in the ground, causing severe damage.

10. By using non approved parts the aircraft insurance may also be in breach.

WARNING :	DO NOT MAKE STRUCTURAL CHANGES DO NOT FIT NON-APPROVED PARTS/ COMPONENTS IN THE AIRCRAFT

11. If there is a valid reason to make structural changes, contact us and we can discuss the options. We are there to assist with technical advice during the building process.

12. During the construction period there is only one inspection that is done before the aircraft is covered. The next inspection is when the aircraft is ready to fly and an application is made for the “Proving Flight Authority”

The owner / builder of a “Non-Type certified Aircraft” (NTCA), will be totally responsible for the airworthiness of the aircraft.

13. The owner is allowed to do all maintenance and repairs on the aircraft. After each repair the aircraft needs to be inspected

14. The aircraft is inspected annually an re-issued with an “Authority to Fly”

WARNING :	NEVER HIDE MISTAKES.

PART 3: WHERE TO BEGIN

1. Before you start constructing the aircraft, promise yourself one thing: I WILL DO MY BEST TO BUILD A SAFE AEROPLANE! There is a big difference between building an aircraft and building any other type of vehicle. On an aircraft everything is either right or gone. Work neatly and accurate, do not settle for anything less. A good job will not only warrant your own safety, but will also increase your machine's resale value.

2. Do not attempt any design changes or install any unauthorized parts without first discussing it with us. Extensive time was spent in designing and testing of the components. Changes could upset the design integrity and result in structural weaknesses or dangerous flight characteristics. Study this manual CAREFULLY making sure that all instruction and drawings are understood. Install and maintain all parts as specified in this manual. Should any items be damaged, return them to the factory for inspection and possible repair or replacement. Take your time and do a proper job. You will discover much of the fun is in the building!

3. If the kit is shipped to you, the first thing to do is thoroughly inspect the exterior of the crate for any visible damage that may have occurred in transit. If there is any damage, report it to the shipping company that delivered the crate. Next open the crate and inspect the contents. It is important that any damage is immediately reported in order to process a claim. You need to file the claim directly to the freight company.

4. After inspecting the contents, jump right into the inventory. Check all items as they are packed per the part's list. Going through the inventory not only verifies that all items are enclosed, but also allows you to become familiar with the different parts and part names. It is important that the inventory is completed when taking delivery of the kit. If you wait more than thirty days, the kit will be out of warranty and this will make discrepancies difficult to resolve. If there are any discrepancies, give us a call or drop us a note and we will gladly take care of it.

5. The parts supplied in the kit carry a warranty for a period of thirty days from the delivery / collection date. This allows time to examine the components and complete the inventory of the kit. The engine is under a separate warranty. The company has the final say on whether parts will be replaced or not. The defective part must be returned for examination. Shipping is at the builder's expense. If the original purchaser sells or transfers ownerships of the kit, all warranties become void. KFA will still provide builders support.

6. An important part of the construction manual is the part's list. The construction manual often refers to the part's list. In the parts list, the quantity of each piece used, the part number and a description as to where it is used, is given. It is also shown where the part, or information about it, may be found in the manual. This is important in helping you to find the appropriate part.

7. Finally and most importantly before starting your BUSHBABY project take the first love of your life out for supper, then explain to her that your spare time is going to be taken up for a "short while" and that she must not worry as she remains your first love. Having her positive towards your beauty in the garage is important! Also you never know when you are going to need a helping hand from time to time.

PART 4: HOW TO SAVE TIME

1. Estimating the time that can go into a home built aircraft project is very difficult. Some builders can probably build the complete aircraft in 400 hours and still do a good job. Others can spend as much as 400 hours on the paint job alone! You must decide what you want in your aircraft. One can either save time by building a very basic plane, and be flying sooner, or spend years building a showpiece that may be never completed. Whatever your goals, never rush over important things or compromise on safety. Primary structure, control system and engine installation are critical to safety, a 400-hour paint job is not. However covering, finish and spray painting is very important for the final “looks” of the plane and the eventual resale value.

2. To do a proper job and still finish the aeroplane in as little time as possible, use the following ten laws from homebuilder experience:

3. First study your building manual, parts list and learn all part names, before tackling any construction.

4. Organize your workshop and tools. Make enough space and keep it tidy. Return every tool to its place after a job is done to avoid wasting valuable hours searching for tools.

5. Work strictly according to the building sequence recommended to avoid wasting time removing parts that were installed premature

6. Plan for the borrowing of tools, purchasing of spares or subsequent kits, so that you do not get stuck halfway in the project.

7. Avoid losing interest in your project by letting the job stand for too long a time. Keep your motivation up by trying to show constant progress with your aircraft. Do something every day.

8. Save “starting -up” time by rather working fewer sessions with more hours than many short sessions. One will progress much further by working 160 hours during a 30-day leave than one would have by working 160 one-hour sessions.

9. Do it right the first time. Measure twice, check twice – do once!

10. Although important to learn proper control feel etc. do not waste too much time sitting in the cockpit doing “ground flying”!

11. Don’t worry about the covering stage, as this is the easiest and most enjoyable part

12. Plan your paperwork, inspections and test flying ahead, arrange to fly from a proper airfield and try to finish your aeroplane for its test flight period during the fair weather months of the year.

PART 5: THE WORKSHOP

1. You do not need a workshop larger than a single car garage to build your BUSHBABY in. However, if this space is crowded and cluttered, it is going to be frustrating to build your aeroplane. No matter what the status of your workshop, you probably can improve the conditions remarkably with just a little effort.

Plan to get your work space organized before starting on your kit.

You will need at least enough space to work on the fuselage. The big parts take up valuable space, and tend to be around for a long time. They are always going to be in the way if your workshop is not neatly organized. Once one part is completed, it must be moved so some safe place for protective storage while you can start on the next part. Finally at the rigging stage you will need enough space to assemble the whole shebang. A pavement in front of your house will do, but make provision to protect your handwork against the weather.

2. You are also going to need storage space for all the kit parts, another reason to get rid of all the junk in your garage Try to have all hardware and small items nearby while you work on the part. By organising yourself and your workshop, a tremendous amount of time can be saved.

3. This, of course, also applies to your tools. There is a saying in the D.I.Y. world that “searching for tools (that were there “just now”), takes up 50% of the time it takes to complete the job”. Therefore, work tidy, organise all your hand tools against a wallboard where you can see what you are looking for. Make a it a habit, to hang the tools back after use.

4. In addition to the tools specified below, you will need a few basic items in your workshop. This includes a few storing racks or shelves against the walls or in the roof to save space and protect your materials. You are also going to need a large dustbin and a workbench with a vice. Cover your bench with a piece of felt or carpet to prevent the parts from being scratched while working. An old carpet on the floor will also help protecting those parts that are assembled on the floor. Finally a set of trestles to build the wings and fuselage on are an essential aid in the building of these items.

5. You need not have a large workshop and expensive tools to do a professional job. Nevertheless, you do need to work tidy and organize your shop.

PART 6: TOOLS AND EQUIPMENT

Few special tools are required for building this aeroplane. The following tools are needed to complete the project. Do not buy tools before hand wait until you are positive that they are needed.
Essential tools

- Hack saw and new blades.
- A small hammer.
- A set of different files including small mill files. (Sharp)
- Water sandpaper in different grades, steel wool and Scotch bright.
- Acetone, MEK or pure alcohol (Not drinking type!) For the cleaning of parts.
- An electric hand drill.
- A centre-drill for pilot holes.
- New 3.3, 4.9, 6, 8 and 10mm drill bits.
- A 100 de-burring tool (countersunk) to chamfer drilled holes. (or a 13mm drill bit)
- Centre punch.
- G-clamps in different sizes and/or aircraft “Cleco” clamps.
- A bench ice.
- Eight 65mm hose clamps.
- Two sawhorses (trestle).
- A protractor, swivel square or angle bevel.
- A 122cm or longer spirit level.
- A short spirit level.
- A pop rivet gun. Note the hole for the 4.8mm steel rivets will have to be drilled out.
- A small tin of steel primer paint. (Metcote from Duram)
- A set of Allen keys.
- A set of flat spanners (pliers or shifting spanners are never used on aircraft.)
- A set of Sockets (6, 8, 10, 13 & 17mm).
- A good quality Torque wrench, from 8Nm
- A 90° square.
- Sheet metal snipes.
- Masking tape, rubber strapping or two old bicycle tubes.
- String.
- Set of brushes in different widths.
- Fabric scissors.
- A carpet knife with sharp blades.
- Accurate adjustable household iron.
- An accurate thermometer to calibrate the iron.
- About 1 litre of primer to use for rivets and to touch up scratched areas
- Cleco pliers and at least 30 – 50 cleco’s

Bonus tools.

- A band saw or sabre saw (jigsaw).
- A small hand planer or similar wood planning tool.
- A powered sanding wheel.
- A pencil type, hand grinder.
- A bench grinder.
- A drill press or drill stand for accurate drilling.
- 8mm hand reamer
- A battery drill

PART 7: GENERAL CONSTRUCTION PRACTICES

DRILLING, REAMING AND DE-BURRING.

1. The first step in building your aircraft is drilling and reaming holes in the steel parts to provide a close tolerance fit. Boltholes, particularly those in primary structural elements, require close tolerances. A well drilled hole, calls for holes to be round, smoothly cut, true-to-size, and drilled perpendicular (normal) to the surfaces. This will ensure full bearing contact for the bolt head and shank. Serious vibration-wear can result in a structure where the holes are not correctly sized for the bolts.

2. Using a blunt or offset drill bit to worm a hole through an aircraft structure is hardly an admirable practice. Yet it is extraordinary to see how many such holes appear in the wrecks of crashed amateur built aircraft. Such techniques may have been used in fabricating ox wagons (and buggies), but in building an aeroplane we normally do not resort to such primitive rites.

3. Once a bolt is installed, there is really no way of determining how good or bad the hole drilling was done. If badly done, it could present a real danger. If the hole was poorly drilled or drilled oversize, the material will not provide that ever-so-essential load bearing support needed. Tightening the nut down hard to compensate for a sloppy fit will not make the problem go away.

4. A big part of the blame for oversized, rough holes can be attributed to improperly sharpened drill bits. Twist drills cannot be sharpened accurately without proper tools, so buying a new set of drills for the job will be worthwhile.

5. The best solution for wrongly drilled part is to replace it with a new part! You may go up to the next size bolt, but sometimes this is not possible due to critical edge distances and clearances. The best way is not to make a mistake in the first place! Using reamers can eliminate mistakes.

6. Start by drilling each hole or brushing with an undersized drill bit. Try to fit the bolt after each pass with a drill bit of 1/10th of a mm larger or use a set of reamers. Use the undersized reamer first. If the reamer can be push in by hand or with minimal effort, turn the reamer with a hand chuck or with pliers. If you need to use a drill motor, go slowly and as straight as possible. If the bolt is still too tight try using the same reamer again before using slide into a “bearing fit hole) with no “slop”. Never turn a reamer backwards. Bolts may vary in size from one another by a few hundreds of a mm. Because of this, it is good practise reaming each hole to fit each individual bolt. Reamers can be borrowed or rent from most engineering workshops.

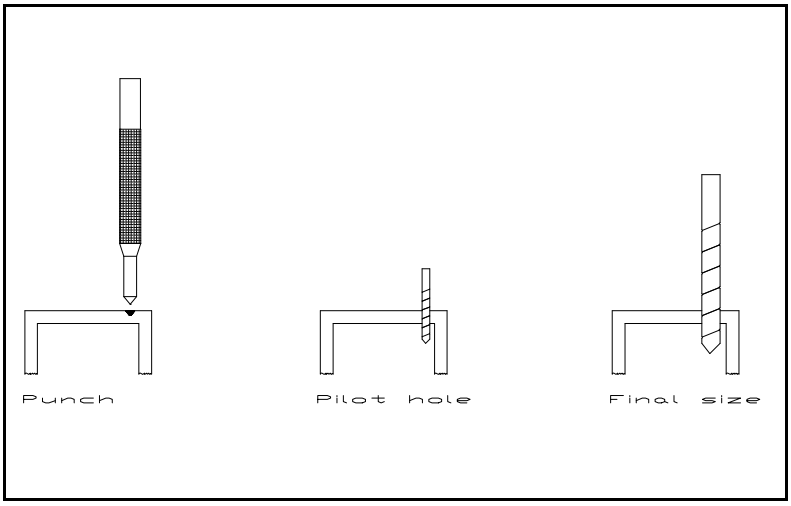
7. How do you drill deep holes with a hand drill? It is always better to clamp a part and use a drill press. However, if you have to use a hand drill, take care and work slowly! Always start by drilling a small pilot hole to establish alignment. Slight corrections are then possible prior to final drilling to the exact size. Pilot holes must be drilled precisely on a centre-punched mark. If larger diameter holes need to be drilled, use progressively thicker drill bits until the final size is reached.

8. It is important to de-burr all holes in components throughout the construction. Use a 100° single flute countersunk or a larger drill bit. A single rotation of the countersunk can de-burr most holes in aluminium. As the aluminium is soft, the countersunk can be rotated by hand. By de-burring we are changing the sharp edge of a drilled hole to a lightly chamfered edge. This will result in parts that will be less likely to fail under extreme loads. This can be likened to a piece of cellophane paper that has a very slight tear in one edge: when tension is applied, it tears apart easily, but if there are no minute cuts or ragged edges it will take much greater effort to tear it.

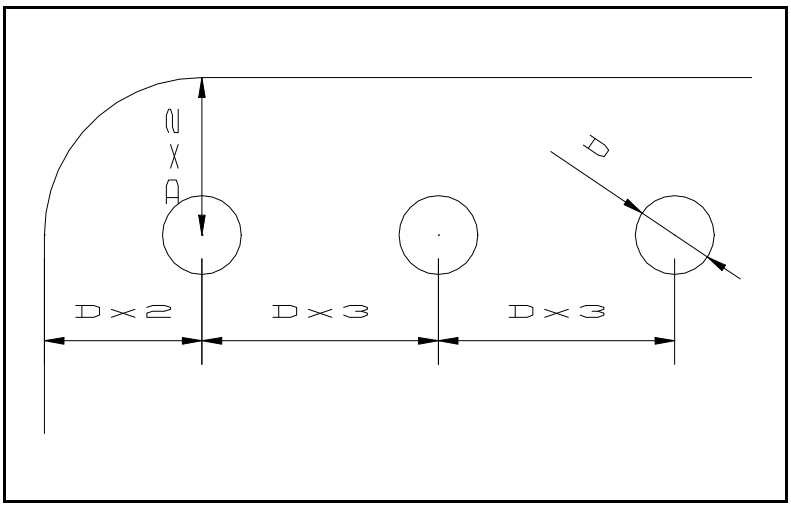
9. By chamfering the edges of the holes slightly, the small cuts and ragged edges are removed. It is understood that some inside holes are impossible to de-burr without a special de-burr tool looking like a corkscrew with a cutting edge on the top edge.

IMPORTANT

1. Ensure that the bit thickness is correct before drilling any final hole. (Check twice, drill once!).
2. Work on a clean carpet or wooden surface and clean drill waste and shavings regularly to prevent scratching the parts.
3. Only use quality new drills. Sharpened drills are usually not running true resulting in elongated hole.
4. First test the drills on a piece of waste material.
5. Don't overshoot the punch marks when drilling the pilot hole.
6. To save time, drill all pilot holes first, then all size holes, and de-burr all holes afterwards.



Punch and drill

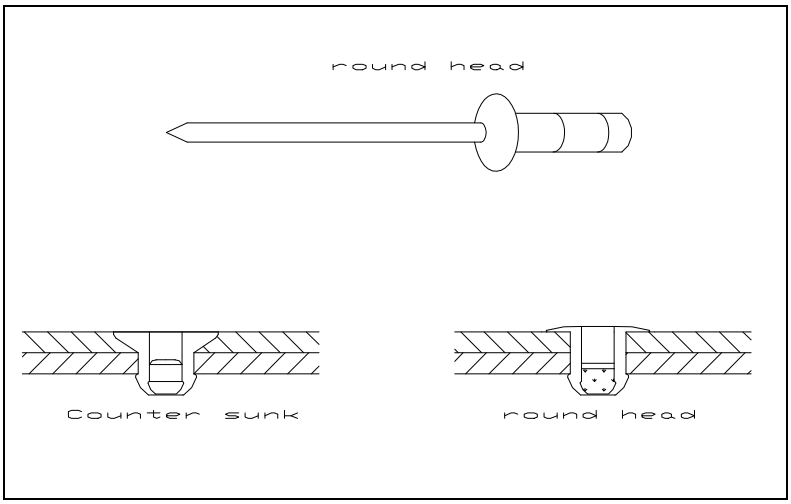


Hole spacing. Minimum distance

RIVETING

1. There are two types of rivets supplied, round head rivets and counter sunk rivets. The counter sunk rivet needs to be installed in a counter sunk hole. After drilling counter sink the hole until the rivet head sits flush with the surface. Counter sunk rivets are used on the engine cowls.

2. Rivets of different lengths are supplied. Make sure to use a rivet with a shaft with the correct length for the job. Dip each rivet in paint/ primer before inserting in the rivet hole. A little paint will press out under the rivet head. Turn the rivet in this paint until the under surface of the rivet head is covered with paint. Pop the rivet in place and wipe off excess paint. The paint will prevent corrosion between the rivet and the structure.



Rivet types

Warning:	Through out the manual, during the building process, you are instructed to rivet components together or in place. The final riveting only occurs at final assembly, after all parts are painted. Always dry fit parts, using the cleco's.

BOLTS AND NUTS

1. The airframe and engine mount structures are designed to transfer loads from one member to the other mostly by shear loading of the attaching bolts. All the bolts are electroplated to prevent corrosion and must be treated with care to prevent the plating from scratching off.

2. On aircraft construction a good quality torque wrench is always used when tightening any structural nut to a specified torque value. When tightening a nut, of a bolt going through a tube, make sure not to over tighten the bolt to the point where it distorts the tube (eg engine mount/ fuselage bolts). Even if the torque is lower than the specified torque.

3. Maximum torque figures (Nm)

BOLT SIZE	HEXAGON BOLTS	ALLEN CAP BOLTS
M6	10	17
M8	25	40
M10	50	85
M12	90	150
M16		

NOTE:	With engines used the manufacturers specified torque figures

4. All bolts on an aircraft are installed in as specific manner dictated by general aircraft practice (except in cases where it is not possible): Install bolts always with the bolt head on top, on the outside, or in the front - thus from the outside-inward, from the top to the bottom or from the front to the rear. Try to have all heads and all nuts on the same sides.

5. Bolts used in a pivoting application (like control stick pivots etc.) are generally used with a castle nut and a split pin through a small hole in the shank. As all the pivot actions, on the BUSHBABY aircraft, were designed to occur around a bushing and not through the movements of a bolt, we can use ordinary Nylock nuts. For extra safety a drop of lock-tight may be used. For ease of inspection, a drop of paint/ varnish or torque seal may be applied to the locked nut. The paint will show a crack if any loosening has occurred.

NOTE:	Nylock nuts are not intended for repeated use. Only use a Nylock once

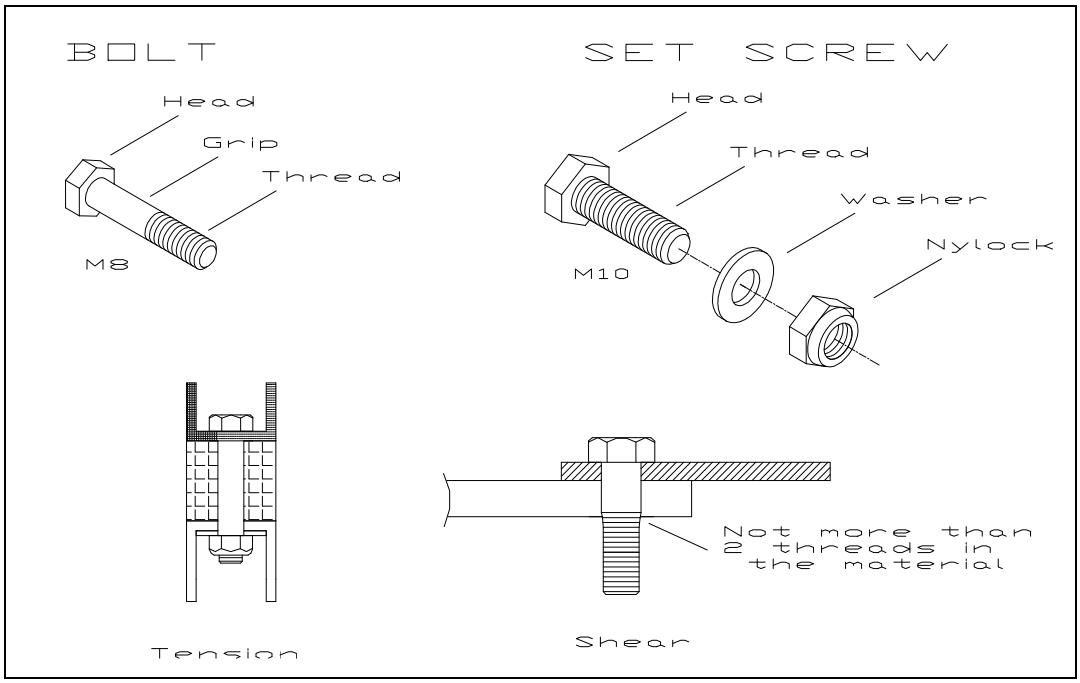
6. Purchase cheap set screws & nuts to use for the initial fitting of parts. Only use the supplied hardware with final fitment of parts

7. Bolts should always have at least one washer under the nut. If necessary a washer can be under the head as well (for soft materials). This spreads the loads and protects the parts.

8. The nut should never be turned into the shank of the bolt. Insert more washers until the shank is covered, maximum 3 washers

9. At least 3 threads should clear at the other end of the nut, for the bolt to be in “safe”.

10. Make sure that the bolt is not bearing on the thread if it is loaded in shear. (This is less important when loaded in tension). The thread is the weakest part of the bolt and it will break if bearing on the tread. Therefore, the bolt must have the correct “grip length”. The solid shaft of the bolt must bear on the structural member. Rather use a longer bolt spaced up with washers, than a too short bolt bearing on the thread.



Bolt and Set Screw

NOTE:	Use “Lock-tite” or “Locknut” with final assembly on all the nuts (Nylocks and other) used on pivoting or moving assemblies (e.g. control system). This will ensure that the torque of the nut is kept.

RIVNUT INSTALLATION

1. The rive nut is normally installed with a special tool (similar to a rivet gun). The rive nut has a section of wall that collapses, when pulled, and forms a flange to the rear of the tab.

2. For the 4mm Rivnut, drill a 6mm hole (9mm for 6mm Rivnut) in the tab where the rive nut is to be installed, paint the bare metal with primer. Thread a M4 x 20 cap screw (M6x25) into the rive nut from the inside. (Part of rive nut installed in the hole). Fit a thick washer over the exposed thread and thread a nut on. Insert the rive nut in the hole, ensuring that the rive nut flange is flush with the tab. Fasten the nut, until the rivnut has completely collapsed and is secure against the flange. Over tightening the rive nut may damage the thread
SCRATCHES, DENTS AND NICKS

1. Scratches, dents, and nicks on a structural part are a possible introduction to a structural failure. Aircraft structures are designed so that each part is responsible for some portion of imposed flight loads. If anything upsets the calculated designed strength of a part, the part is weakened. Stresses tend to concentrate in such places and could cause a crack. Loaded items are especially susceptible to this condition. Scratches and nicks are DANGEROUS and can eventually lead to fatigue and failure of the part.

2. Sand out scratches, then polish with finer paper until no marks is left.

NOTE	Above is more relevant to the aluminium components (wing spars)

3. To mark any part/ material, use a felt tip or ball point pen. Do not scratch parts/ material with something sharp and do not use a pencil on aluminium. Pencil lead induces electrolytic corrosion and can cause a possible stress line. Remove the ink with thinners.

CORROSION PROTECTION

1. At the factory, once a steel component is removed from the jig it is degreased and sprayed with 'Metcote PRIMER" (a Duram product) a very durable etch primer, good for steel and aluminium. If any of the steel components supplied in the kit have not been primed, them thoroughly clean and remove all rust from the parts before applying a primer. Other types of corrosion protection may also be used, like "strontium chromate primer", Dulux D.T.D. 5567 Hi-chem, "zinc-chromate" or even "power coating" Primers are also used to dip all rivets in before installing them wet. This will both protect the rivet against corrosion and prevent dissimilar metal corrosion.

2. If you live in a wet climate you may choose to treat your aluminium parts as well. Metcote, strontium chromate, epoxy primers, Alodine and a range of special aluminium primers can be used. The aluminium parts can be sent in for "anodising" or powder coating.

3. For aluminium parts, (sheet metal) we recommend light sanding before priming and painting. Use 400-800 grit water sandpaper on the aluminium parts. Clean with acetone or MEK after sanding and do not touch the parts with your bare hands after cleaning. Some aluminium parts may be anodized instead of painted

4. Some builders prefer to chrome certain components, refrain from chroming critical components. (The engine mount, lift struts or gear legs). .

WORKING WITH EPOXY

1. The epoxy (WSA-D) supplied is an incredibly durable and strong epoxy used mostly in the wing building process. The epoxy is very chemical resistant and is an approved aircraft epoxy. The epoxy is a two part epoxy with one part being white (or blue) and the other grey (or yellow).

2. The epoxy is mixed in a 1: 1 ratio by volume (1 teaspoon of each) or 1: 1 by weight.

3. The pot life is 20 minutes in warm conditions. The epoxy has a limited shelf life of one year from date of kit purchase. The importers sometimes extend the expiry date.

3. To test if the epoxy is still usable, mix a small quantity and check that it fully cures within 12 hours. If the epoxy is extremely lumpy then it best be replaced.

SURFACE PREPARATION

1: Aluminium:

1. The surface to be epoxied should first be cleaned with industrial acetone (part no WSA-C) or MEK, obtainable from any hardware store. Do not use acetone from a chemist, as this acetone contains oil. After cleaning the aluminium, do not touch the area to be epoxied as oil from your hands could weaken the bond, roughen the area to be epoxied with 80 grit water paper. Degrease the roughened area with acetone and epoxy immediately. If the aluminium is to be epoxied at a later stage remember to degrease the area prior to epoxying.

2. Apply the epoxy with a spatula or putty knife, working it into the roughened area on the aluminium and into the wood. Applying pressure to the epoxied area is advisable until the epoxy completely set. As the epoxy does not bond to unprepared aluminium, it is very important to ensure that the aluminium has been degreased, roughened and that the epoxy is worked into the materials being epoxied.

2: Steel:

1. Prepare as for aluminium, although a file may be used instead of water paper.

3: Wood:

1. Ensure that the wood to be epoxied is dry and free of any dirt, eg oily finger prints. The wood may be slightly roughened with sand paper. Also ensure that the epoxy is worked into the wood. Try to clamp, the parts epoxied, together for long as possible.

2. Do not be over hasty in moving the parts before the epoxy has set, removing hardened epoxy is extremely difficult if you have to redo a bond.

GENERAL ITEMS

a) Building record

1. The SACAA requires that each step of the building process be documented in the aircraft log book. The NTCA logbooks have provision for build history. Additionally they CAA require that the "Assembly Check List" be filled in once an assembly stage has been completed. To help each section in the manual has a space where the completed date can be filled in.

Completion Date: _____ Name: _____

b) Service bulletins/ letters

1. As with any aircraft there are the equivalents of certified aircraft, "AD's" that are issued. As NTC aircraft are not bound by AMO's, the onus rest with the owner to see that his aircraft abides by the latest published SB's. The SB,s have traditionally been posted on the e-group, but unfortunately most owners are not members. All technical data will be published on the websites, this includes Rotax SB's. Owners are encouraged to regularly check the website to ensure that their aircraft are safe.

c) Wing folding

1. The wing pivots on the rear spar and the lift strut, at the fuselage.

2. Remove the turtle deck and the flapperon counter weights. Loosen and remove the bolts connecting the posh-pull tubes to the control horns. Slowly swing one wing back towards the fuselage. As it swings back, the trailing edge of the flapperon should rotate up to 90 as it reaches the vertical fin.

NOTE:	Check that the flapperon does not catch the turtle deck tabs, welded onto the fuselage, or the push-pull tubes.

PART 8: CONSTRUCTION SEQUENCE

The construction sequences are summarised here and were proven by many builders to be the quickest assembly method. Obviously one can work on several kits simultaneously, but the final assembly should occur in the same sequence. The building sequence of each kit is set out in the particular section of the manual.

- Building the wings
- Mating the wings to the fuselage, rigging.
- Assembly of the fuselage kit.
- Installing the landing gear.
- Cover and finish kit, excluding the covering
- Installing the engine.
- Instrumentation and wiring
- Striping and painting individual parts, preparing for covering
- Pre-cover inspection
- Covering
- Painting the aircraft
- Weight and balance
- Inspection & application for “proving flight authority” from SACAA

PART 9: MANUAL SEQUENCE

FUSELAGE

- Preliminary inspection and cleaning of all parts.
- Corrosion protection.
- Drilling and reaming of holes, rounding of tabs.
- Varnish, paint and fit floorboards.
- Install control system.
- Install rudder, horizontal stabilizer and elevator.
- Install rudder pedals and rudder.
- Fit baggage area floorboards (option).

LANDING GEAR

- Preliminary inspection and cleaning of all parts.
- Corrosion protection.
- Drilling and reaming of all holes, rounding of all tabs.
- Assemble wheels, brakes and landing legs.

WINGS

- Preliminary inspection and cleaning of all parts.
- Corrosion protection.
- Prepare wing parts for assembly.
- Assemble the spars, ribs and brackets.
- Align wing components, mix structural adhesive and glue ribs.
- Install drag and anti-drag braces and rivet brackets in place.
- Install trailing edge and wing tips.
- Mate wings to the fuselage and install wing struts.
- Install butt ribs, root ribs and inner wing ribs.
- Install flapperons and match to control system.
- Install pitot tube
- Install fuel tanks.

COVER AND FINISH

- Seat belt installation
- Fit seats
- Construct the firewall and install.
- Install firewall flame protection.
- Install the instrument panel.
- Fit boot cowl.
- Fit turtle deck.
- Install stringers to the fuselage.
- Prepare the aircraft and have the pre-cover inspection done.
- Prepare the airframe for covering.

ENGINE KIT

- Assembly and installation of the engine.
- Installation of fuel lines.
- Fitting of engine cowling.
- Installation of instrument.
- Installation of electrical wiring and battery.
- Installation of throttle controls.

COVERING

- Remove the landing legs and tail wheel.
- Covering the aircraft.
- Fabric sealing
- Paint preparation

ASSEMBLY

- Painting
- Install the landing gear and tail wheel.
- Connect braking cables.
- Assemble and fit all components permanently.

FINAL

- General inspection.
- Check nuts for proper torque.
- Check rigging and adjust controls.
- Registration of your aircraft
- Weight and balance test.
- Final inspection
- Application for “proving flight authority”.

1. For most part you can continue with construction in the above order. However the completion of each section may depend on work completed in other sections, so you may have to accomplish certain tasks off one section to complete another. You may find it easier to install the landing gear early in the project, especially if your work area is small, to help moving of the fuselage.

2. For a clear understanding of the building process, it is recommended that you read the entire manual first, and then tailor the building sequence to fit your particular circumstances. You especially need to plan the painting sequence. Paint as many components at one time, as this save time and expensive paint.

TIP :	With the use of the “cleco-kit” all the parts can first be fitted to the fuselage, removed and then all the components painted before final assembly. It is not desirable to have to drill holes or file on the fuselage after it has been covered as the sharp filings invariably damage the material

3. Try to prevent double work and remember to build as light as possible. Every gram in excess weight is a gram pay load lost.

HAPPY BUILDING AND REMEMBER WE CAN BE CONTACTED ANY TIME.