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12.25 Fit The Static/Pitot System Complete. (WM8)  
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SECTION 15 LIST OF SKETCHES Continues

Sketches listed are attached and are to be used as companion documents to the Assembly Manual.

Note that sketches are not necessarily sequential as some have been deleted

15.1 Sheet Metal Manufacture (SM)

SM 1 Aileron Components
SM1A Flap Components
SM2 Deleted
SM3 Leading Edges
SM4 Deleted
SM5 Wing Rib Pockets
SM6 Aileron & Flap Box Sub Spar (comes formed)
SM7 Deleted
SM8 Aileron Cable Bracket
SM9 Deleted
SM10 Deleted
SM11 Wing Tip Infill Panel
SM12 Firewall Two Seater
SM13 Deleted Gascollator Bracket Avail through Spruce & Speciality if required
SM14 Side Panels Two Seater
SM15 Bottom Plate Two Seater
SM16 Instrument Cowls Two Seater
SM17 Turtle Deck Two Seater
SM18 Deleted
SM19 Instrument Panel Two Seater
SM20 Deleted
SM21 Elevator Trim Tab
SM22 Fin Root Fairing
SM23 Prepare The Propeller Spinner Base/Cone optional
SM24R Deleted
SM25 Deleted
SM26 Template for Aileron Ribs
SM27 Template for Flap Ribs

15.2 Timber Parts Manufacture (TM)

TM1 Ribs/Caps
TM2 Stringers For The Wings
TM3 Pilot Floor Two Seater
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Sketches listed are attached and are to be used as companion documents to the Assembly Manual.

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WM1A Ribs/Spars/Pockets/Drag, Anti Drag Bracing Tubes
WM1B Reinforcing Spar/Ribs
WM2  Ribs/Spars/Fabric Cover Bracing Tubes
WM3  Guide Fingers/Spars Two Seater
WM4  Fuel Tank/Stringers/Leading Edge/Aileron Box Sub Spar/Ailerons
WM4A Location of cushion between tank and spar
WM4B Fuel Level Gauge (Metal Tank)
WM5  Lift Strut Brackets/Spars
WM5A Lift Strut Brackets/Spars/Jury Struts
WM6  Deleted
WM7  Flap Actuator/Cables/Brackets/Flap Control Lever
WM8  Static/Pitot Head System (with flaps)
WM8A  Pitot Head

15.4  Fabric Covering (FC)

FC1  Fabric Cover The Wing
FC2  Fabric Cover The Fuselage
FC3  Fabric Cover The Vertical Stabiliser/Rudder
FC4  Fabric Cover The Horizontal Stabiliser/Elevator
FC5  Fabric Cover The Undercarriage Leg

15.5  Sub Assembly (SA)

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SA2  Assemble The Lift Strut Two Seater
SA3  Assemble The Stiffener Rib/Side Panel and Leading Edge/Side Panel
SA4  Assemble The Pilot Door
SA5  Assemble The Pilot Window Frame/Latch
SA6  Assemble The Turtle Deck
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SA7B Position The Brake Cable/Brake Hub
SA8R Assemble The Electrical/Instrument Looms (Rotax) (suggested info)
SA8J Assemble The Electrical/Instrument Looms (Jabiru) (suggested info)
SA9  Assemble The Elevator Control Tube
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ACB1A Fit The Tail Wheel Assembly
ACB1B Fit doubler Tail Wheel Spring
ACB2 3 & 4 Deleted
ACB5 Fit The Elevator Control Tube
ACB6 Fit The Flight Control Torque Tube and Bearing Blocks
ACB7 Fit The Brake Pedals/Brake System/Connect Rudder Cables Two Seater
ACB8 Fit The Battery Cables and The Pilot Floor (suggested info)
ACB10 Fit The Trim Control/Trim Control Cable (ACB9 deleted)
ACB11 Fit The Rudder/Connect Control Cables
ACB12 Fit The Horizontal Stabiliser/Support Struts
ACB13 Fit The Horizontal Stabiliser/Elevator/Controls/Trim Tab/Controls and The Fairing.
ACB14 Fit The Fuel Lines From The Fuel Tank To The Fuel Valve Position
ACB15 Fit The Battery Mount/Strap And Battery (suggested info)
ACB16 Fit The Panel/Fuel Valve/Switches (Instruments/Radio/Fuse Blocks) (suggested info)
ACB17 Fit The Fuel Lines to Fuel Valve
ACB18 Fit The Firewall/Engine Mount/Wiring Looms/Carburettor Heating Box (Jabiru Only)
ACB19 Fit The Choke/Throttle/Carburettor Heating Box Cable (Jabiru Only)/Electrical Connector
Panel/Connector Strips/Master Relay …suggested info
ACB20 deleted
ACB21 Fit The Headrack/Skylight
ACB22 Fit The Pilot Door, (Radio Antenna/Coaxial Cable) (suggested info)
ACB26 Fit The Pilot Harness, (Cabin Upholstery) (suggested info) (ACB23, 24, 25 deleted)
ACB27 Fit The Turtle Deck
ACB28 Assemble The Engine/Engine Mount (Jabiru Only)
ACB29 Fit The Exhaust/Flexible Ducting and Engine Oil Breather Bottle/Hose
ACB30 Fit The Instrument Cowl (ACB31, 32 deleted)
ACB33 Fit The Instrument Cowl (ACB31, 32 deleted)
ACB34 Fit The Side Panels and Bottom Plate
ACB35 Fit The Windscreen
ACB36 Fit The Wing Tip Fairing/Fairing Infill Panel
ACB38 Fit And Track The Propeller/Spinner Base/Spinner Cone (ACB37-40 deleted)
ACB41 Fit The Top/Bottom Engine Cowl
ACB42 Rig The Aircraft Controls
ACB43 Fit The Pilot Seat, (Cabin Rear Panel) suggested info
1.2  Page Amendment Status

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1.3 Notice

All references to “The Company” in this document shall be read in lieu of Tekweld Pty Ltd as trustee trading as “Supa Pup Aircraft” and AERO PUP (trademark) ABN 68 501 750 640.

Every effort has been made to ensure that the data is correct and current in this Manual and any accompanying documentation. No responsibility will be taken for changes in Sketch/Specifications that occur as The Company continues to improve the features and quality of the products.

All material in this document is subject to copyright and must not be reproduced or transmitted in part or in whole in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of The Company.

1.4 Message To Client

The Company takes this opportunity to congratulate you on your choice of Aircraft. The Company takes great pride in being able to offer to you an advanced Aircraft design in Kit form that meets strictest safety standards of construction, welding and craftsmanship appropriate for its class.

You may wish to feed back to The Company the impressions that you have and any recommendations that you would like considered. We would welcome such valued contribution from you as a client and would give every consideration to the adoption of your suggestions as appropriate.

Before commencing the construction of the Kit it is important that you thoroughly check the contents and condition of the Kit as delivered, against the Parts Catalogue to ensure that no damage or loss has occurred in transit. In particular check all components (including cables) for signs of damage or defects. This should be done immediately and reported within 30 days of delivery.

1.5 Airworthiness. Continues

Please note that as the Purchaser and Builder of the Kit you are totally responsible for the airworthiness of your Aircraft. You build the Aircraft and refer to the appropriated documentation in the process. You thereby certify that you have:

* Inspected all components and found them to be airworthy.
* Carried out at least 51% of the work in process of building the Aircraft.
* Inspected the Kit for flaws in materials and welding, and for appropriate tolerances.
* Properly located the centre of gravity.
* Carried out flight testing of your Aircraft in an assigned test region and upon completion of the flight testing endorsed your Aircraft log book to certify that you have flown the prescribed hours and that the Aircraft performs properly in all test modes.
1.4 Airworthiness Continued

As a part of compiling reference documentation for inclusion in the assembly Process a journal of building activity must be kept (also refer Section 2.6). Test samples of adhesive mixes, setting temperatures and humidity should be noted. Take photographs of the work at step by step procedures and record the names of personnel involved in the project. This record of information will assist in the final inspection process and add to the resale value of the Aircraft. Whilst it is not a legal requirement it is recommended that stage inspections be carried out by Aircraft qualified personnel.

Important Note...

Work in closely with the appropriate organisation who you will register the plane with, notify them early that you have started the project, IE if registering as an Ultralight then contact RECREATION AVIATION AUSTRALIA in Canberra.
If registering as a General Aviation (VH Experimental) contact the SPORT AIRCRAFT ASSOCIATION OF AUSTRALIA and obtain the details of people in your State. Generally these contacts are very useful can be a great source of knowledge. Remember that when the plane is built, one of the organisation’s people will have to sign it off as being airworthy, they will be more cooperative if they are confident that you have built it correctly so do not leave it to the last minute to contact them, work in with them.

AC43 is the “Bible” or Authority for aircraft construction methods, it is essential reading. Download it for free from the www.saaa.com website under downloads. 18 Mb zip file.
SECTION 2 PRELIMINARY

2.1 Preparation

The Aeropup Kit is designed for easy working and assembly by the owner. However particular care should be taken to ensure that the working environment is clean and work practices are sound and orderly to ensure that the finish and structural quality of the Aircraft is satisfactory.

It is ESSENTIAL that this Manual is studied in detail before commencing construction.

2.2 The Manual Continues

This Assembly Manual is provided for Aircraft Kit Serial Number.............................this same number is also given as the Assembly Manual Number for your particular Aircraft.

The Manual provides documentation for a complete step by step process for the Final Assembly of the Aircraft commencing with receipt of the full Kit of components and materials as received from The Company.

It is important to abide by the instructions contained in the Assembly Manual to ensure that aspects of care, structure, finish and safety, that were observed during the production of the Kit, are continued in the final assembly. Note that the Sketch Numbers that are listed are related to the Production Sequence Code Numbers.

Do not make any unauthorised alterations to the Aircraft.

Other literature is available as a secondary general support reference for the assembly of the Kit and in this respect it is recommended that the following be used:

* “Construction of Amateur Built Aircraft in Australia” by Stephen Mitchell
* “Firewall Forward” by Tony Bingelis
* “Acceptable Methods, Techniques and Practices (AC 43)” by U.S. Dept of Transportation. (Inspections, Repairs, Alterations) (Federal Aviation Administration)
  Download from www.saaa.com under “downloads”

The Parts List and Sketches included at the end of this document shall be read as companion documents to the Assembly Manual and cross references may be made in this respect. Note that the Sketches are diagrammatic and are not drawn to scale.
2.2 The Manual Continued

In relation to particular procedures, refer to the reference documents pertaining to it by the supplier or manufacturer ie...

* Painting

* Adhesives Procedure.

* Fabric Covering

Section 17 is provided at the back of the Assembly Manual for any Owner’s Notes that you may wish to incorporate into the document whilst in the process of the Aircraft assembly.

2.3 Revisions

This Manual has been provided after considerable scrutiny. However if appropriate improvements are obvious or if any discrepancies are observed then these should be noted and communicated to The Company before proceeding further. Approved revisions to the Manual will be noted in amendments.

2.4 Amendments

Please refer to the Amendments section at the beginning of this Manual for any latest changes that have been introduced and which need to be read in conjunction with the body of the Manual.

If during the course of your constructing of the Aircraft further amendments become necessary then these will be forwarded to you for incorporation into your particular Manual.

2.5 Service

If after reading through this assembly Manual you do not feel confident enough to proceed then contact the Company immediately and discuss the possibility of receiving qualified assistance.

If you experience difficulties during the process of Kit assembly of the Aircraft then the Company will be prepared to assist you as appropriate. This will be considered as “Commercial Assistance” and must not allow an excess of 49% of the contribution made by the Company in the construction of the Kit.
ASSEMBLY MANUAL No. Contd

2.6 Records

Section 16 is provided at the back of this Manual for recording:

* Amendments * Late Changes * Suggestions for Improvement

* Impressions * Difficulties of Maintenance/Assembly/Use.

Also provided in Section 16 at the back of this Manual is a sample sheet of a dated, step by step Journal of the activity/events that has occurred in the assembly of the Kit. This sample sheet should be copied to build up the necessary number of pages to form the Journal. Fill in any relevant information at the time of occurrence. It is essential that you keep a journal starting at the very first task/event. Provide a library of data and sample mixes of adhesives and keep a record of documentation as stated in Section 1.5.

The column set for the Production Sequence in the Journal allows for the entry of the Section Number shown within the Assembly Manual [eg. Production Sequence for the Assembly of the Fuel Tanks/Wings is SECTION 8.4 (WM4)].

SPARE PARTS LIST

The Supa Pup Aircraft Form CF 37/ Spare Parts Catalogue is attached to this Manual and is to be used as a companion document to the Assembly Manual.
SECTION 3  ORGANISATION AND GENERAL REQUIREMENTS

3.1 Workshop/Tools/Storage Continues

The following general guidelines are given for an acceptable Workshop practice and environment:

* Workshop/Store cladding should be weatherproof and reasonably dust-proof.
* Floor to be sealed and level........preferably concrete or timber.
* Lighting must be adequate.
* The Aircraft assembly area should be clean, unobstructed, free from grease and automotive/other components etc.
* Adequate storage space must be provided for raw materials and completed components to prevent damage.
* A special suitable protected, dry and dust-proof area must be provided for the storage of composite cloth. This should include a cutting table so that the cloth can be prepared without contamination.
* Sensitive, accurate scales are required for measuring proportions of epoxy and glue etc.
* A wet/dry bulb thermometer shall be considered for monitoring the temperature and humidity during gluing, covering and finishing to provide for appropriate conditions as recommended by particular suppliers/manufacturers of product.
* Provision shall be made for ventilation and the dispersion of solvent vapour.
* All marking out for shaping and drilling shall be made by using a fine tip felt pen. Scribers shall not be used since this will cause a surface defect which in turn will cause a stress raiser in the material.
3.1 Workshop/Tools/Storage Continued

Every effort has been made to ensure that the Aircraft can be built without special tools and machinery. However:

* The Builder shall be required to obtain access to an industrial quality folder in order to shape sections of sheet metal components. (local sheet metal shop)

* Cleco pliers, 0.125” x 50 / 0.156” x 10 / 0.187” x 10 skin pins and skin clamps are required for the assembly of riveted sheet metal components. These may be purchased via Aviaquip in Melbourne as required.

* The Builder may not be able to fit the Wing Rib Pockets with a conventional power drill. For this exercise a flexible drill extension with a small chuck will be required to access the tight internal corners of the Wing Rib Pocket/Spars/Rib assemblies.

• Setting of the Wings dihedral can be accomplished with the aid of a Model Incidence Meter available from Modeler shops.

3.2 Kit Manufacture Criteria

In the construction of the Kit The Company has determined that all parts and sub assemblies that require critical alignment shall be pre-machined by The Company. Further to this all components that are welded shall also be welded by The Company. This decision is made to maintain a safe, quality product supplied to the builder. All other work of cutting/shaping/folding/drilling/reaming/fitting shall be the responsibility of the builder. Where this Manual moves into directing the assembly of components then it is assumed that the parts are formed ready to sub assemble and final assemble. Further to this it is expected that all parts to be corrosion protected and/or painted as neccessary in accordance with normal aviation practice before the parts are assembled.

Generally all dimensions that are laid down in documentation and drawings are shown in decimal or fractions of inches. The Company had made this decision since the majority of materials/hardware/reference literature is sought from America who continue to apply the imperial system of units.

Generally the sizes of parts and hardware referred to in the documentation (including the Spare Parts Catalogue) are shown in decimal inches for the reason shown above and to maintain a standard of reference. (eg 0.094, 0.125”, 0.156” and 0.187” are the same as 3/32, 1/8”, 5/32” and 3/16” respectively). These dimensions are rounded up to two decimal places on the Drawings and Sketches. (eg 0.09, 0.13”, 0.16” and 0.19”)
3.3 Procedures To Build Continues

The step by step process that is laid down in this Manual has been found to be the optimum procedure for manufacture/assembly of the Aircraft and it is strongly recommended that the process as laid down is strictly followed. For example: At the start of the project it is recommended that the undercarriage/tail wheel is assembled and fitted to the fuselage. This will then allow for easy movement of the assembly and a “tripod” stand to facilitate working on the structure.

Before commencing the work at each step of sub assembly/assembly:

* the sheet metal and other component parts must be completed. (Note that some holes dimensioned and shown on the Sheet Metal drawings are for reference only and shall be spotted through from holes that are pre-drilled on mating parts... First read the Manual to fully understand this concept.)

* check that all parts/materials are supplied according to the Kit lists and Sketches.

* check that all parts/materials are free from damage, defects and swarf inclusions.

Do not remove the protective coating (as applicable) until all final fitting for the particular component is to be completed.

Where riveted assemblies occur then groups of pilot holes/groups of final hole size/final rivet assemblies shall be made using Cleco fasteners to maintain alignment of the mating components at all stages.

Note that when the Fibre Glass Constructions are rivet installed into the Aircraft and the rivet tail abuts to a fibre glass mating component/s, the rivet tail shall be formed in conjunction with rivet backing washers and as shown on the Sketches. (also see Section 4.4.2)

Note that when Timber Constructions are rivet installed into the Aircraft and the rivet tail abuts the timber component/s the rivet tail shall be formed in conjunction with the rivet backing washers as shown on the Sketches.

The following shall apply to cable swaging procedures: Refer book AC43

* Slide on the Nicopress Sleeve, not supplied as they must match the tool used, corrosion protection is wise if in a corrosive area.

* Wrap Cable around the Eye/through Nicopress Sleeve and adjust/cut the Cable to length allowing at least 0.12” past the sleeve, it can be soldered in after swaging and preferably tested although the size of cable used is far above the minimum required for this application.

* Use the Nico Swaging Tool in accordance with the tool manufacturer’s instructions.

* Do not use Heat Shrink Sleeves as they cover an area that needs to be inspected
3.3 Procedures To Build Continued

Safety wiring shall be used to secure separate parts in a manner that will ensure that relative movement between the parts (ie tendency to loosen) will result in the tightening of the wire. The wire used shall be of appropriate gauge and free from damage.

When material is required to be severely deformed, such as the end crushing and setting of the Fabric Cover Bracing Tubes, the Aluminium Alloy Shall first be annealed to avoid strain cracking in the material. To anneal the material first coat the section to be deformed with solid soap. Then heat the section until the soap layer turns a dark brown. Immediately quench the material in water. Proceed to form the material.

All folds in materials shall be made with a nominal radius of four times the thickness of the material that is folded to ensure a minimum risk of cracking the material. Such radii shall also be included between a flattened section and a tubular section when a tube is end crushed and set to the appropriate angle (eg at the Fabric Cover Bracing Tubes).

Fold lines as shown on the Sketches allow for the “grow” in the material when folded. The positions of the folds as dimensioned are determined from experience. Various folders have different characteristics and thus the initial folds on components shall be checked by the Builder before proceeding further. All measurements are to be taken off the plane itself, a good way to do this is to make a cardboard template first.

Rivets that are mounted close to an edge or end of a component shall have a minimum distance of twice the diameter of the rivet between the edge/end of the material and the centre of the rivet to ensure that the rivet cannot break out. Also note that when a rivet connection is made between a flat sheet and a mating tube then the rivet centre shall fall on the contact point between the flat plate and the round tube surfaces.

Where external sharp corners are not required and unless a specific radius is given then it is appropriated to provide a radius of 0.13” to remove all unnecessary sharp corners in sheet metal components.

Where countersunk head screws or countersunk head rivets are used to secure thin sheet (eg Leading Edge of Wing to the Wing Stringers) then it is appropriate to dimple the sheet to accept the head for a flush fitting of the screw/rivet.

Where further work is required on components after painting then the damaged paint finish shall be put through the process of touch-up as required.
3.3 Procedures To Build Continued

The installation of some panels and sections may require final minor trimming to clear obstructions. Such final trimming shall be carried out to provide appropriate minimum clearance and care shall be taken to ensure that the structural strength of the Aircraft is not compromised.

Similarly it is appropriate to compare the marked out components against the mating sections before final cutting to shape. (eg the Rib Cap cut-outs in the Aileron Box Sub Spar). Cut-outs in the Aileron Box Sub Spars for example need to match the actual ribs, do not rely entirely upon measurements.

Particular care should be taken in forming concave cut-outs in sheet metal components. It is recommended that a small hole be drilled at the internal corners of the cut-out and the material be securely held whilst removing the cut-out section, to avoid vibration to the component. If this recommendation is not followed then stress cracking may be occur at the inner corners of the cut-out.

Whenever an adhesive process is required in the manufacture of the Aircraft the Builder shall maintain a library of mix data, setting conditions and sample mixes of adhesives.

Where adhesives are used to bond mating surfaces in timber then residual laser cutting charcoal shall be removed from the interfaces (eg at the bonding of the Ribs to the Rib Caps)

Drilling the holes in the Tabs welded to the Fuselage shall be carried out with care. The Tabs may need to be supported in the process and the final hole size may be achieved after using a succession of smaller drills.

The procedure for manufacture/sub assembly/assembly as set out in this Manual is segregated into stages as follows:

* Sheet Metal Manufacture. (SM) Refer to the Index for details.
* Timber Manufacture.(TM) Refer to the Index for details.
* Aileron Manufacture.(AM) Refer to the Index for details.
* Wing Manufacture.(WM) Refer to the Index for details.
* Fabric Covering.(FC) Refer to Supa Pup Aircraft Form CF 57/ (‘Aircraft Covering Procedure’).
* Paint Finishing.(PF) Refer to Supa Pup Aircraft Form CF 56/ (‘Painting Procedure’).
* Sub Assembly (SA) Refer to the Index for details.
* Aircraft Build.(ACB) Refer to the Index for details.
SECTION 4 WORKING WITH AIRCRAFT MATERIALS OF CONSTRUCTION

4.1 Aircraft Hardware

The Aircraft hardware necessary for the Aircraft construction is supplied with the Kit and is manufactured to comply with the appropriate Aerospace Standards. This ensures that the finished Aircraft has a standardised total aerospace structural integrity.

Do not use general hardware which is normal commercial grade and quality, if in doubt, avoid using the hardware unless it is in a non structural and low stressed area.

4.2 Torquing

Incorrect and inappropriate application of torque values for Aircraft hardware can lead to premature wear fatigue and even failure. Always strictly comply with the torque values that are specified in the Manuals and associated literature.

4.3 Hardware Reuse

Where hardware has been used/dismantled/used again, be careful to inspect such hardware for signs of strain. In particular self locking nuts shall not be reused.

During the process of initial setting and fitment you may prefer to use other hardware and preserve the proper, appropriate hardware until the final assembly.

4.4 Hardware Fitting Continues

All bolts (bolts may vary slightly in diameter for any one size) shall be properly fitted to provide an accurate locating fit, without binding, by appropriate careful reaming of the associated hole. Reaming shall be by hand or at a very slow machine speed. Note that if the fit is tight in a chrome moly tube assembly that this may lead to a seizure of the assembly.

Four sizes of rivets are used in the construction of the Aircraft. The Sketches show nominal dimensions for the rivet holes.....However the actual drill hole size for the installation of rivets shall be as follows:

* 0.10” Diameter (3/32”) Use a Number 40 drill size
* 0.13” Diameter (1/8”) Use a Number 30 drill size
* 0.16” Diameter (5/32”) Use a Number 20 drill size.
* 0.19” Diameter (3/16”) Use a Number 10 drill size

Lubricate the assembly of stainless steel bolts to stainless steel nuts to prevent seizing.
4.4 **Hardware Fitting** Continued

The standard hole in washers is larger than the nominal size quoted by the manufacturer and thus when used in conjunction with the rivets the rivet tails are inclined to pull through the washer hole. To avoid this problem and where rivets are used in conjunction with washers then the next size smaller washer shall be drilled through to suit the associated rivet size. (eg. Use 0.125” Bore washer for 0.16” rivet) This rule applies except in the case of 0.125” rivets where an M3 washer is acceptable.

It is the owner’s responsibility to become aware of issues associated with Aircraft bolts/screws type, grip length, washers type, nuts type, rivets type, and cable applications. Note that AN960 Washers are used to provide a smooth bearing surface under the head of the bolt/nut and also as a shim (as required) to provide the appropriate grip length for the bolt.

Grease the final assembly of components where relative movement between parts can be anticipated.

4.5 **General Fitting**

Study the Manual and plan ahead before attempting each stage of assembly.

Care should be taken to avoid damage to components in the final fitting and shaping.

Deburr all holes before fitting and before riveting mating components to ensure correct tight assembly

Excessive heating of the Chrome Moly components when drilling and machining will cause a hardening of the material. Use sharp drills at a slower speed with coolant to prevent overheating.

4.6 **Care of Transparent Plastics**

Transparent plastics have advantages over glass for Aircraft use, but are vulnerable. Care should be taken when working with or near the material to avoid damage and scratching. Note the fitting of neoprene sleeve inserts in the assembly of this material as a precaution against local stress cracking.

Only clean the surface with a clean, grit free, soft cloth or sponge which is saturated with copious amounts of mild soapy water. Do not use petrol, alcohol, benzene, acetone, carbon tetrachloride, thinners, other solvents or glass window cleaning sprays.

Minor scratches may be removed with a mixture of turpentine and chalk which should then in turn be removed with soapy water. Note that polishing too long in any one area will result in visual distortion through the screen.

When the surface is clean and no evidence of scratching is visible, a thin even coat of good grade of commercial wax may be applied to the surface. Final polishing shall be by rubbing lightly with a clean soft dry cloth.

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4.7 Kit Supplied Materials

The Company has determined that Adhesives/Sealants/Cleaning Fluids/Coatings/Thinners/Solvents shall not be supplied with the Kit since such materials create a hazard in transport and in some cases have a restricted shelf life which may expire before the builder is ready to apply the product. An appropriate adjustment in the Kit cost has been allowed in this respect.

Where such non supplied materials are called up in the Assembly Manual then the Specifications of the materials are shown as follows to ensure that the correct and appropriate product is purchased by the builder and is referred to in this Manual as selected Adhesive:

1. 3M EPX GREY Epoxy Adhesive DP190 Tech service Ph 02 98335407 Fax 02 98335585
   A two part adhesive to be used with an applicator Gun (not essential), it is flexible & easy to use.
   You will need 5 units of small A & B tubes

2. Note …
   If using any other glue the onus is on you to ensure that it is as suitable or better than the 3M product.

3. Eposolv 70 (Solvent/cleaner) For cleaning aluminium surfaces, Ciba Speciality Chemicals.

NOTE: Storing adhesives in a refrigerator may extend shelf life of the product check with supplier first.

   Sealant (Bedding of Fuel Tanks onto Wing Spars, Heat Box to Firewall, Weather seal Windscreen/Windows).

   Gasket Seal (Firewall penetrations, Firewall surround seal)

   Plastic Adhesive 739 available from Dow Corning Australia, Victoria.

   Hi Temp. Silicon RTV Gasket 26BR (Tube) available from Repco Auto Parts, Australia.

Due to the economies of bulk buying by the Company, it is appropriate to supply certain Kit items when needed by the Builder. Such items (eg Fabric for covering the Aircraft) should be anticipated by the Builder and advance notice of requirement given to the Company in order to eliminate/minimise delays in delivery.

NB... Due to different engine configurations there are various optional equipment items embedded throughout this manual, where these are not part of the “standard” kit it will be noted as such. items such as instruments, radios, upholstery, and electrical systems are not included.
SECTION 5    SHEET METAL MANUFACTURE (SM)

5.1  Make The Aileron / Flap Components. (Sketch SM1,SM1A)

Note… Make the wing framework up before doing this section

Note this section thoughout the Manual is written for the Aileron, but is applicable for the Flaps on the Two Seater. The standard kit includes the pre folded ailerons / flaps now.

Note that the position of the holes for riveting through to the Aileron Ribs are not equi-spaced.

Pilot drill the rivet holes. Do not drill holes for the Aileron Hinge at this stage.

Deburr all machined surfaces.

Note that the Aileron Horn Ribs are of the thicker material.

Inspect the Aileron Skin for compliance to the Sketch.

Fold the Aileron Ribs to the marked lines The handing of fold will generate the Port or Starboard Ribs.

Inspect the finished item for compliance to the Sketch.

Lay out the sheet metal and mark the pilot drill rivet holes/lightening holes/0.19” diameter Control Link hole and the profile of the Aileron Horn as shown on the Sketch. (Note that the bolt holes for the Aileron Horn Flank will be drilled through from the Aileron Horn Flank at the SM2 stage.)

Pilot drill the rivet holes 0.19” diameter Control Link hole.

Final drill the rivet holes, the Control Link Hole to the correct size.

Deburr all machined surfaces. Inspect the finished item for compliance to the Sketch.
5.2 Make The Leading Edges (Constructed from three sections for each Wing). (Sketch SM3)

Always check the measurements against the fitment area and adjust for any discrepancies.

Lay out the sheet metal and mark the pilot drill rivet and screw holes, the profile and the roll start/end lines of the Leading Edge as shown on the Sketch.

Trim the Leading Edge to the required shape/size.

Pilot drill the rivet holes for the mating sections at one end of each section (this will be the outer skin on final assembly.)

Pilot drill the screw holes for the countersunk stainless steel screws for fixing to the Top Stringer only. The holes for fixing to the Bottom Stringer will be drilled when the Leading Edge is fitted to the Wing and accurate alignment to the centre of the Bottom Stringer can be established (Refer Section 8.6).

Deburr all machined surfaces.

Inspect the finished item for compliance to the Sketch.

Tip...these can be folded around on the wing...you may like to pre fold the shape by using a 1” bar pressed in to create the basic shape (not essential)...align the sheets and screw/glue onto the bottom stringer (which should be screwed and glued onto the ribs) then use old car seat belts to pull and tension it around tight against the nose of the ribs making sure there is adequate glue in place, use a belt over each rib and tension up evenly, when done and fitting evenly glue and screw the top down to the stringer making sure the screws are set in to avoid showing through the fabric.
5.4 Deleted

5.5 Fold The Wing Rib Pockets. (Sketch SM5)

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Wing Rib Pocket as shown on the Sketch.

Pilot drill the rivet holes but leave 4 holes undrilled on one of each pair of opposing pockets (on the notched side). These remaining 4 holes will be drilled through from the opposing holes on final assembly to the Ribs.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch.

Inspect the finished item for compliance to the Sketch.
Make The Aileron / Flap Box Sub Spar. (Sketch SM6)

Note that mounting a small wooden block between the upper and lower faces when clamped into the vice will facilitate a stiffening of the section for forming/filing the cut out recesses.

Pilot drill the rivet holes. Do not drill holes for the Aileron Hinge at this stage.

Deburr all machined surfaces.

Inspect the finished item for compliance to the Sketch.

5.7 Deleted
5.8 Make The Aileron Cable Bracket. (Sketch SM8)

Lay out the sheet metal and mark the pilot drill bolt holes, the pilot drill cable hole, the profile and the fold lines of the Aileron Cable Bracket as shown on the Sketch.

Pilot drill the bolt holes.

Final drill the bolt holes to size.

Pilot drill the cable hole.

Final drill the cable hole to size.

Deburr all machined surfaces.

Fold the Aileron Cable Bracket to the marked lines and to the correct handing as shown on the Sketch.

Inspect the finished item for compliance to the Sketch.

5.9 and 5.10 deleted
5.11 Make The Wing Tip Infill Panel. (Sketch SM11) OR full rib may be left instead

Lay out the sheet metal and mark the profile and the fold lines of the Rib Infill Panel as shown on the Sketch. Note: This can only be completed at the time of proceeding with Section 12.36

Trim the Rib Infill Panel to the required shape/size and deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. See Note above

Inspect the finished item for compliance to the Sketch and for snug fit into the recess formed by the Wing Rib Caps and the Aileron Box Sub Spar.

Paint as required

5.12 Make The Firewall. (Sketch SM12)

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and fold lines of the Firewall as shown on the Sketch.

Trim Firewall to required shape/size to suit the fuselage frame. Cut all tags to size. Pilot drill rivet holes in Firewall Base only.

Pilot drill the mounting holes for the Engine Mount, plus Regulator/Starter Solenoid if applicable.

Deburr all machined surfaces.

Fold all tags to the marked lines and to the correct handing as shown on the Sketch. (a contoured block to 4.50” radius held against the sheet will assist in folding to the final regular profile).

Inspect the finished item for compliance to the Sketch.
5.13 **Gascolators and mounting Bracket** …Optional

recommended depending on engine type, whilst not supplied due to variations in engine design and fuel systems, check with the engine supplier as to whether they want one fitted, if required they can easily be ordered over the net with a credit card from Spruce & Speciality in the USA and posted out. Search their site for Homebuilt Gascolator.

5.14 **Make The Side Panels** [Port (access) and Starboard (fixed)]. (Sketch SM14) Continues

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Side Panels as shown on the Sketch.

Trim the Side Panels to the required shape/size.

Pilot drill the rivet holes. (Do not drill the holes for the Starboard Side Leading Edge Strip or for the Port Side Stiffener Rib or for the top of the Starboard Side Panel).

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. The handing of the fold will generate the Port or Starboard Panel.

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Stiffener Rib for the Starboard Side Panel.

Trim the Stiffener Rib to the required shape/size.

Fold to the marked lines as shown on the Sketch.

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Leading Edge Strip for the Port Side Access Panel.
Make The Side Panels [Port (access) and Starboard (fixed)], (Sketch SM14) Continued

Trim the Leading Edge Strip to the required shape/size.

Fold to the marked lines as shown on the Sketch.

Paint the Panels in accordance with Supa Pup Aircraft Form CF 56/ (‘Painting Procedure’).

Make The Bottom Plate. (Sketch SM15)

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Bottom Plate as shown on the Sketch. Take measurements off the fuselage.

Trim the Bottom Plate to the required shape/size.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. (Note the centre crease required at the centre of the Bottom Plate to match the Bottom Fuselage Stringer)

Inspect the finished item for compliance to the Sketch.

Paint the Bottom Plate in accordance with Supa Pup Aircraft Form CF 56/ (‘Painting Procedure’).

Make The Instrument Cowls. (Sketch SM16)

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Top Cowl as shown on the Sketch, make sure to leave a ½” gap around the two front V bars of the frame to avoid vibration onto the bars, put a strip of rubber moulding around to protect.

Trim the Instrument Cowls to the required shape/size.

Pilot drill the rivet holes.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. Note the handing of fold will generate the Port or Starboard Top Cowl.

Paint the Top Cowl in accordance with Supa Pup Aircraft Form CF 56/ (‘Painting Procedure’). Use a dark colour or cloth trimming to stop glare.
5.17  **Make The Turtle Deck/Components.** (Sketch SM17)

Note that this item needs to be quite solid and stiff as it will vibrate when approaching the stall, if not stiff enough it will scare you first time you hear it.

Lay out the sheet metal and mark the Camloc holes, the profile and the fold lines of the Turtle Deck as shown on the Sketch.

Trim the Turtle Deck to the required shape/size.

Fold to the marked lines as shown on the Sketch.

Offer the Turtle Deck to the Fuselage and confirm the correct shape, and position of the Camloc holes

Pilot drill the Camloc holes. (Refer Section 11.5 and Sketch SA 5)

Inspect the finished item for compliance to the Sketch.

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and fold lines of the Trailing Edge Cuffs as shown on the Sketch.

Trim the Trailing Edge Cuffs to the required shape/size.

Pilot drill the rivet holes.

Fold to the marked lines as shown on the Sketch. (Note the handing of the folds will generate Port or Starboard Trailing Edge Cuffs).

Inspect the finished item for compliance to the Sketch.

Lay out the sheet metal and mark the pilot drill rivet holes, the profile and the fold lines of the Turtle Deck Channels as shown on the Sketch. Note the longitudinal taper of the Deck.

Trim the Turtle Deck Channel to the required shape/size.

Pilot drill the rivet holes.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch.

Inspect the finished item for compliance to the Sketch.
5.18 Deleted

5.19 Make The Instrument Panel. (Sketch SM19)

Lay out the sheet metal and mark the pilot drill holes for the Instrument Panel mounting holes/Instruments mounting holes, the profile and the fold lines of the Instrument Panel as shown on the Sketch.

Trim the Instrument Panel to the required shape/size.

Pilot drill all the holes.

Final drill/cut all holes to size (including the machining of the larger Instrument mounting holes).

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. Note the handing of the fold for the Instrument Panel.

Inspect the finished item for compliance to the Sketch.

Paint the Panel in accordance with Supa Pup Aircraft Form CF 56/ (‘Painting Procedure’).
5.20  **Make The Windscreen Trims**  
Deleted  
Windscreen is now fixed direct to instrument cowls with a painted strip over the fasteners and a hold down strap across the front.

5.21  **Make The Elevator Trim Tab.** (Sketch SM21)  
External trailing type

Lay out the sheet metal and mark the pilot drill rivet holes, the profiles and the fold lines of the separate sections of the Trim Tab Assembly as shown on the Sketch.

Cut the Sections to the required shape/size.

Pilot drill the rivet holes in the Trim Tab, the Top Plates and pilot drill one rivet hole only in each of the Tab Bracket and the Bottom Plate Bracket.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch.

Inspect the finished item for compliance to the Sketch.

Paint the metal Trims
5.22 Make The Fin Root Fairings. (Sketch SM22)

Lay out the sheet metal and mark the pilot drill screw holes, the profile and fold lines of the Fin Root Fairings as shown on the Sketch, do not drill into the airframe, the front section has a folded internal piece to hold it in place.

Offer the Fin Root Fairing to the Fuselage and confirm the correct shape, and position of the screw holes, in corrosive areas use stainless button head threaded screws (require taping threads into tabs.

Trim the Fin Root Fairings to the required shape/size.

Pilot drill the screw holes.

Deburr all machined surfaces.

Fold to the marked lines as shown on the Sketch. (Note the handing of the folds will generate Port or Starboard Fin Root Fairings).

Inspect the finished items for compliance to the Sketch.

5.23 Prepare The Propeller Spinner Base/Cone. (Sketch SM23) Optional depends on engine

Mark the pilot drill Bolt/Anchor Nut holes in the Spinner Base as shown on the Sketch.

Pilot drill the Bolt/Anchor Nut holes.

Finish drill the Bolt/Anchor Nut holes to size (countersink for the Anchor Nut rivets).

Deburr all machined surfaces.

Fit the Anchor Nuts as shown on the Sketch.

Mark the pilot drill screw holes on the Spinner Cone and the profile of the Spinner Cone edge (for the Propeller Blades clearance) as shown on the Sketch.

Trim the Spinner Cone to the required shape/size, concentricity is important to avoid fractures in operation

Pilot drill the screw holes.

Final drill the screw holes to size.

Deburr all machined surfaces.

Inspect the finished item for compliance to the Sketch.
SECTION 6 TIMBER PARTS MANUFACTURE. (TM)

6.1 Make Ribs/Caps/Splints. (Sketch TM1)

Trim the cut out of the Wing Root Rib only to provide clearance for the Fuel Tank Fittings. (This operation may be left until the fitting of the Fuel Tanks into position, as shown in Sketch WM4).

Cut the Cap Strips to length (Note Short/Full Ribs and Top/Bottom differences) Mark and pilot drill the required holes with a 3/32 drill make sure drilling is into centre of rib.

Cut the Rib Splints to size, only needed on the long ribs to strengthen the area over the rear spar.

Position the Cap Strips onto the Ribs. Mark the Rib through the Cap Strip for the screw positions. Number each mating Cap Strip/Rib and remove. Countersink holes in Rib Cap strips.

Pilot drill the Ribs in preparation for the stainless steel countersunk screws. The holes are to be at plumb centre of the width of the Ribs to avoid the screw breaking out at the side of the Rib.

Deburr all machined surfaces and remove the sharp edges.

Ensure that areas to be bonded are grease/dirt free.

Assemble the Rib Splints and Cap Strips to the Ribs with selected Adhesive. Clamp the Rib Splints into position and use the stainless steel countersunk screws to secure the Cap Strips.

IMPORTANT …Note that the cap strips are fitted to the ribs before the ribs are fitted to the spar.

Note that the meeting of the Cap Strips at the Trailing Edge shall be shaped and clamped together during this assembly to hold the final Wing profile whilst the adhesive sets.

Remove excess adhesive.

Inspect the finished item for compliance to the Sketch.
6.2 Make the Stringers For The Wings. (Sketch TM2 and ACB3)

Cut and notch, as necessary, the timber to shape/size to provide smooth aerofoil curves to the wing and to allow the full bedding and gluing of the appropriate Stringers into the Wing Rib. Fine stainless Screws can be used to hold the stringers onto the ribs to get spacing correct and hold in place while the glue sets, these can be left in as extra security.

Inspect the finished items for compliance to the Sketches.

Check and remove any grease or dirt from components.

Paint/seal the Stringers with good quality epoxy varnish except where the fabric glues on. The reason to seal is to keep moisture out of the timber and best to do when dry weather.

6.3 Make The Pilot Floor. (Sketch TM3)

Check the orientation of the external ply timber grain.

Lay out the timber sheet and mark the pilot drill screw holes and the profile of the Pilot Floor Sections as shown on the Sketch.

Trim the Pilot Floor Sections to the required shape/size.

Pilot drill the screw holes.

Final drill the screw holes to size. (in preparation for the attachment screws).

Deburr all machined surfaces and remove the sharp edges.

Inspect the finished items for compliance to Sketch.

Check and remove any grease or dirt from components.

Paint/seal the Pilot Floor.
SECTION 7  AILERON MANUFACTURE (Port and Starboard). (AM)

7.1  Aileron / Flap Assembly. (Sketch WM4 And WM7)

Position one of the Aileron Horn Ribs/Aileron Horn as shown on the Sketch WM4.

Pilot drill the rivet holes through from the Aileron Horn to the Aileron Horn Rib.

Position the second Aileron Horn Rib to the Aileron Horn Rib/Aileron Horn assembly.

Pilot drill the rivet holes through from the Aileron Rib/Aileron Horn to the second Aileron Horn Rib.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces. Refer Section 3.2 for finish and painting.

Glue and Rivet the two Aileron Horn Ribs/Aileron Horn as shown on the Sketch WM4, etch prime first and seal to outside exposure to limit corrosion to this area.

Mark the common centre lines of the rivets along the returned Flanges of the Aileron Ribs.

Check that sufficient clearance is provided at the protrusion of the Aileron Horn through the Aileron Skin when the Aileron Horn Ribs are offered into position.

Make a shaped timber block infill piece to fit snugly into the returned Flanges of the Aileron Ribs. This will prevent the flanges from bending when the holes are drilled through from the Aileron Skin to the Aileron Rib Flanges.

Position the Aileron Ribs (Including the Aileron Horn Ribs)/Aileron Skin as shown on the Sketch. (Note that the Aileron Ribs are not all equi-spaced along the Skin length). Sight through the existing pilot holes in the Aileron Skin to align the rivet centre lines in the Aileron Ribs. Be careful to determine the accurate encased position of the Aileron Rib.

Pilot drill the rivet hole through from the Aileron Skin to the Aileron Ribs at the top face, front end of each of the Aileron Ribs and secure the Aileron Ribs in position with Cleco Fastens.

Pilot drill the rivet hole through from the Aileron Skin to the Aileron Ribs at the bottom face, rear end of each of the Aileron Ribs and secure the Aileron Ribs in position with Cleco Fasteners.
7.1 **Aileron Assembly.** (Sketch WM4,WM4D, WM7 And SM1,SM1A)

Check for alignment of the rivet centre lines again and pilot drill the rivet hole through from the Aileron Skin to the Aileron Ribs at the bottom face, front end of each of the Aileron Ribs and secure the Aileron Ribs in position with Cleco Fasteners. Now proceed to pilot drill all remaining holes. *(Note Do not drill for the Aileron Hinge rivets at this stage)*

Pilot drill the Aileron Hinge but note the final required alignment to the Aileron as described in the following paragraph

Now position the Aileron Hinge to the Aileron front surface as shown on the Sketch with the top edge of the Aileron Hinge fulcrum flush with the top of the Aileron and the length of the Aileron Hinge matching the length of the Aileron. Pilot drill through the Hinge into the Aileron.

Pilot drill the rivet holes in the Aileron Hinge through into the Aileron Skin/Aileron Ribs.

Final drill all rivet holes to neat not sloppy size *(this is a critical area)*

Disassemble and deburr all machined surfaces. Note that the Aileron Ribs and Aileron Skin shall be marked to provide for identical reassembly.

Run a bead of neutral curing silicon along inside of the trailing edge of the Aileron Skin *(vibration dampening)*.

Glue and Rivet the Aileron Skin/Aileron Ribs/Aileron Hinge *(in high corrosive areas you may like to paint the inside)* the ally sheet used is the most corrosive resistant.

Note that the Aileron Hinge is not fitted to the Aileron Box Sub Spar until the Wing is Fabric Covered at a later stage.

Inspect the finished assembly for compliance to the Sketches.

Lightly Paint the finished Aileron / Flap Assembly keep coats to minimal due to weight.
8.1 Assemble The Ribs/Spars/Pockets/Drag, Anti Drag Bracing Tubes. (Sketch WM1) Continues
(Not that one end of the Leading Spar has been machined to remove a section of the Web)
Position the Front and Rear Spars into a support Fixture according to the principles as shown on the Sketch. (Note the 0.50" wash-out at the rear Wing Tip, and the machined web of the Front Spar at the Wing Root end). Sturdy sawhorses can be used and fixed to the floor. These must be parallel and dead level. Spars must be perfectly clean to ensure proper adhesion of the Adhesive
Clean off any burnt residue from the Rib bores. Slide the Ribs with rib caps fitted over the Spars as shown on Sketch no. WM1 and Sketch no.TM1. Also note that the Wing Root Rib shall be selected for its specific position since this has already been prepared to clear the Fuel Tank Fittings.

Make sure that all rib cap strips are in line by clamping a straight edged something along them, otherwise you will have to shave them to get the fabric to sit nicely on top of them.
Position Ribs, as shown on the Sketch. (Set for correct final projection of Spars at the Wing Root end and allow for final trim to length of the Spars at the Wing Tip end.) Take into account the positions of the wing strut brakets, the stringers have to be cut to allow for these.
Final set the Ribs to the Spars with selected Adhesive (Check that the Ribs are square to the Spars)
Fine stainless screws can hold the stringers onto the ribs and left there once glued

Position Ribs/Pockets as shown on the Sketch (The Drag, Anti-Drag Tubing may be located into temporary position at this stage to assist with the alignment of the Pockets).

Pilot drill the rivet holes through from the Pocket to the Rib and to the Spars. The rivet holes shall be drilled at the horizontal centre of the Spars. (Ensure that the Pocket is hard against both the Rib and the Spar in this operation.
Final drill all rivet holes to size. Great care is required at this stage to ensure that the holes in the sandwiched Ribs and opposing Pockets are perfectly aligned when the rivet holes are drilled.

Disassemble and deburr all machined surfaces.
Reassemble with selected Adhesive
Rivet and glue Spars/Pockets as shown on the Sketch. Remove excess adhesive.
Inspect the finished assembly for compliance to the Sketch.

Position the Drag, Anti-Drag Bracing Tubes/Pockets as shown on the Sketch. Note the 0.13” facet chamfer clearance at each end of the Drag, Anti Drag Tubes to allow admittance of the Tubes into the Pockets. Do not fit the second Drag, Anti-Drag Bracing Tubes from the Wing Tips at this stage, to allow for the fitting of the Rear Lift Strut Bracket. Take care to avoid damage to the surface of the Spars when setting the Drag, Anti-Drag Bracing Tubes into position.
8.1 Assemble The Ribs/Spars/Pockets/Drag, Anti Drag Bracing Tubes. (Sketch WM1) Continued (Note that one end of the Leading Spar has been machined to remove a section of the Web)

NOTE carefully… a slight sweepback can be put into the wings to shift them slightly rearward 1 deg, this is useful if using a light engine such as the 4 cyl Jabiru, it eliminates the need to add approx 7 kilos of weight to the front to achieve the wt & Bal. Achieve this by where the rear spar is drilled.

Wing tip to wing tip string line crosses over skylight at 60 mm back from leading edge

Add 3/8 on inch to rear of Stabilizer

Set up wings and then make wing struts to suit as sweep back alters the angle due to the bottom bracket having two bolts there is no give in bracket

This moves the C/G Zone back 30mm and puts the pilot and passenger in a better position for light weight engines. Be careful not to foul the headrack which may need to be tapered in at the rear, leave the headrack loose until the whole plane is rigged then fit it in place to match the wing snuggly.

Pilot drill the rivet holes through from the Pockets to the Drag, Anti-Drag Bracing Tubes.

Rivet the Drag, Anti-Drag Bracing Tube/Pocket as shown on the Sketch.

Use selected Adhesive fill at the point where the centre of the Drag, Anti-Drag Bracing Tube passes through the intermediate Ribs.

For the Fabric Cover Bracing Tubes:

Cut and form the Fabric Cover Bracing Tubes to length and shape as shown on the Sketch.

Pilot drill rivet holes in the Fabric Cover Bracing Tubes as shown on the Sketch

Note that the Fabric Cover Bracing Tubes at the Rear Spar are different in length to the Fabric Cover Bracing Tubes on the Front Spar

Note that the crushed ends of the Fabric Cover Bracing Tubes are not completely in line and should be set to suit the compound angle between the attach surface of the Spars and the attach surface of the Ribs/Stiffener Angle.

Cut, form and fold the Stiffener Angles to length and shape as shown on the Sketch.

NOTE…do not install the front (third) nose spar until the strut brackets are fitted and rigged.
ASSEMBLY MANUAL No. [ ] Contd

8.2 DELETED
ASSEMBLY MANUAL No. Contd

Single seater info deleted
8.3  **Setting The Wings Into Position**

Set the Fuselage up to neutral flight position. Meaning level from Nose to Tail, as well as from Port to Starboard.

Mark 3/4” from Wing Root end of Rear Spar on the underside for centre of Hinge Pin Hole on both Wings. Present the Port Wing to the Fuselage, and use a suitable support to hold the Wing in position until the Starboard Wing is fitted. Present the Starboard Wing to the Fuselage. At this point each Wing needs to be set with the 1 Degree Dihedral (at least).

Line the 3/4” mark up with centre of the hole in the bracket on the underside of the spar, brace the wing so that it can’t move in the drilling process. Drill through the rear spars from underneath using the bracket as a guide.

Run a stringline along the Leading Edge, from the Port Wing tip to the Starboard Wing tip, to insure that both wings are parallel (or 1 deg swept back if you have angled the tank rib) Mark and drill the Lock Pin holes in the front spars.

With the Lift Struts assembled, the Lift Strut Brackets can be fitted at this point, in accordance with Section 8.5.

If Jury struts are to be fitted, they can be made and fitted at this point, in accordance with Section 8.3A

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8.3A  **Fit The Guide Fingers To The Front/Rear Spars** (Sketch WM3)

For the Rear Spar:

Cut and shape the Guide Fingers.

Fit the Guide Fingers/Rear Spar End. (to clear the Fuselage when the Wings are folded back, as shown on the Sketch). Mark the Hinge Pin holes from the existing holes in the Spar.

Pilot drill and final drill the rivet holes.

Disassemble and deburr all machined surfaces.

Reassemble with selected Adhesive

Rivet the Rear Spar/Collar/Guide Fingers as shown on the Sketch. Remove excess adhesive.

Mark and shape the Rear Spar End and drill the Hinge-Pin holes accordingly. The holes shall provide for the dihedral angle of the Wings when finally installed.
ASSEMBLY MANUAL No. Contd

Inspect the finished item for compliance to the Sketch.

For the Front Spar:

Cut and Shape the Guide Fingers.

Fit the Collar/Guide Fingers/Front Spar End as for the Rear Spar. (Split the Collar to fit over the Front Spar as shown on the Sketch).

Mark and drill the Lock-Pin holes from existing holes in the Spar. The holes shall be square to the centre and axis of the Spar. The holes shall provide for the dihedral angle and attack angle of the Wings.

Inspect the finished item for compliance to the Sketch.

8.4 Assemble The Fuel Tanks/Wings. (Sketch WM4) Continued.

Position the Fuel Tanks/Wing assembly as shown on the Sketch with the Tanks abutting the Wing Root Ribs.

Note clearance in the Wing Root Ribs for the Connection Fittings in the Fuel Tanks.

Pilot drill the rivet holes through the forward curved lip of the Fuel Tank and Wing Spars.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces.

Note that the fuel tanks are tested before they leave the factory but prior to the installation of the Fuel Tanks, each Tank shall be subjected to a water pressure test of 1.5 PSI for a period of one hour with no evidence of leakage. This to ensure that no damage has occurred to the Tanks in transit or storage. Note that this testing can be accomplished with a column of water in a tube the diameter of the filler neck 3.5 feet head (column) of water above the upper surface of the Tank, mark exactly and check for variation. Each tank is tested before dispatch.

A good backup precaution is to seal over all the external welded areas with a 2 pack fuel tank sealant called Semkit PR-1422 B2 available from Aviaquip in Melbourne, this forms a back up protection against the rare possibility of stress fracture cracks that may develop around welds.
Assemble The Fuel Tanks/Wings (Continued)

Positioning Of Tank Shock Rubber On Spars. WM4A Position Rubber Sheet as shown making sure that Rubber Sheet is above the front Rivet line as shown in Sketch. Glue in position
Reassemble the Fuel Tank to the Wing Spars with a Silicon bedding layer check that tank height is lower than ribcaps to allow for a false (shaping) ribcap strip to be glued to the center of the tank top.

Rivet the Fuel Tank to the rear spar allowing for the box sub spar to fit against the rear spar this may require trimming the fuel tank rear edge, rivet at approx 45 deg. Trim the top section of the sub spar to clear the fuel tank and make sure it wont rub or vibrate against the tank, remove excess Silicon. Inspect the finished assembly for compliance to the Sketch.

Make and fit the false shaping rib with Adhesive onto the fuel tank center area

8.4A Assemble The Fuel Level Gauge. (Sketch WM4B) Metal Tanks ONLY.

Using high quality liquid sealer to seal threads, assemble elbows into tank so that the open ends point towards each other.

Cut a short length of clear fuel hose cut to fit and insert between elbows so that the fuel level will be clearly visible.

Ensure assembly is secure and well sealed.

Inspect finished item for compliance to Sketch.

Inspect the finished assembly for compliance to the Sketch WM4A.

8.5 Assemble The Lift Strut Brackets/Front and Rear Spars. (Sketch WM5)

This Section shall be read in conjunction with Section 12.23 and 8.3 The Lift Struts will be required.

Position the Lift Strut Brackets/Lift Struts/Wing Spars as shown on the Sketch when the Wings are also located in position to the Fuselage. (This accounts for the final wing dihedral).

Drill the rivet holes through from the Lift Strut Brackets to the Spar. The rivet holes shall be at the horizontal centre of the Spars.

Disassemble and deburr all machined surfaces, paint with epoxy primer as necessary.

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8.5 Assemble The Lift Strut Brackets/Front and Rear Spars. (Sketch WM5) Continued

- Assemble with Adhesive.
- Rivet the Lift Strut Brackets/Wing Spars as shown on the Sketch. Remove excess adhesive.
- Position the brackets so that the adjustable rod ends are well into the thread allowing for the locknut and correct dihedral of at least 1 deg.
- Inspect the finished assembly for compliance to the Sketch.
- Position the second Drag, Anti-Drag Bracing Tubes as shown on the Sketch WM1 and install as for Section 8.1.
- Note …the extra foremost spar can be fitted at this point (Sketch WM1) and secured in place with selected adhesive and brackets, it is possible to convert the front spar into an auxiliary fuel tank, If you do, make sure not to drill any rivets into it, the securing brackets would need to be clamps.

8.1A Assemble The Jury Struts/Lift Struts/Ribs (Sketch WM5A)

Mark out, drill and fold items 7 and 8 as shown on Sketch WM5A.

Position item 7 to Wing Rib and drill holes for bolts.

Position item 8 to Rear Spar and drill holes for rivets.

Using sections of Front and Rear Lift Strut Material supplied, bend items 5 and 6 to shape. Note attachment lugs to be facing upwards as per Sketch.

With 3/8 tube supplied, cut to length, flatten both ends and drill holes as per Sketch. Before drilling holes assemble all items and check dimensions. Disassemble and drill remaining holes.

Reassemble and check for compliance to Sketch.

8.6 Fit The Stringers/Leading Edge. (Sketch WM4 and TM2 and SM3) Continues

Check that the Fuel Tank is installed then position the Stringers across the Ribs/Wing assembly. At the final position the outer surface of the Top and Bottom Stringers shall not protrude beyond the outer surface of the Rib Caps to ensure that there is minimum (or none) step between the Rib Cap and the Leading Edge when fitted. It may be necessary to dress the outer surfaces of the Stringers to provide for this condition.

Trim the Stringers to length. (Measure over the Ribs and refer to Sketch TM2). Note the Bottom Stringer is to be trimmed to allow clearance for the Front Spar Lift Strut Bracket.

Ensure that areas to be bonded are grease/dirt free. Assemble the Stringers to the Ribs/Wing with Adhesive and secure the assembly alignment until the adhesive is set.
8.6 **Fit The Stringers/Leading Edge.** (Sketch WM4 And TM2 and SM3) Continued

Inspect the finished item for compliance to the Sketches.

Confirm that the Leading Edges are made and rolled to shape.

Position the Leading Edge/Wing as shown on the Sketches (Each Wing has a Leading Edge which is in three sections).

Pilot drill the rivet holes through from the outer skin to the inner skin of mating sections.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces.

Rivet the Leading Edge sections together (Do not use selected Adhesive for this assembly).

Pilot drill the screw holes through from the Leading Edge to the top Stringer for the stainless steel countersunk screw positions....the holes in the timber Stringers shall allow for the grip of the No 6 screws. (These positions shall align with the centre of the Stringers).

Secure the Leading Edge to the top Stringer and stretch the Leading Edge down to the bottom Stringer.

Pilot drill the screw holes through the Leading Edge and into the bottom Stringer then disassemble.

Final drill the holes to size and countersink/dimple the Leading Edge to accept the countersunk head of the stainless steel countersunk screws.

Deburr all machined surfaces. Reseal any machined timber structure. Reassemble the Leading Edge/Wing.

Screw the Leading Edge to the Wing and using selected Adhesive along the mating surfaces of the Leading Edge/Stringers as shown on the Sketch. Remove excess adhesive. (Use 0.63” Diameter drill for the countersunk screws guide holes in the Stringer to prevent splitting the timber).

Make up bung with large ‘REMOVE ME’ tag to protect pitot tube during ground handling/storage.

Inspect the finished assembly for compliance to the Sketches.
8.7 Assemble The Aileron / Flap Control Cable Brackets and Cables To Wings. (Sketch WM7, WM7A)

Refer Section 12.42 to fully understand the implications for assembling the Control Cables.

Position the Aileron Control Cable Bracket/Wing Rib. (Note the 1.44” and 5.13” Dimensions for the bottom hole). The Bottom Rib will need to be dressed to clear the Aileron Control Bracket.

Pilot drill Bolt holes through the Aileron Control Cable Bracket to the Wing Rib (Note Aileron Control Bracket Angle).

Final drill the mounting holes through the Aileron Control Cable Bracket/Wing Rib assembly as shown on the Sketch.

Disassemble and deburr all machined surfaces. Reseal any machined timber structure.

Bolt the Aileron Control Cable Bracket/Wing Rib assembly.

Position the Cable through the Wing Structure and attached to the Control Cable Bracket.

Anchor the Cable to the Wing Structure all as shown on the Sketch with Cable Ties at each Rib. Inspect the finished assembly for compliance to the Sketch.

8.8 Assemble the Pitot Head. (Sketch WM8A).

Trim and deburr the tube ends evenly.

Using a piece of 1.25” O.D. tube to bend around, bend the tube as shown on Sketch WM8A.

Cut and drill a piece of 0.063” Chrome Moly Plate as per diagram and pass over end of tube.

Braze plate and tube together so that Pitot can be mounted to bottom leading edge stringer.

Position the Pitot Head/Stringer as shown on Sketch WM8.

Pilot drill the mounting holes through the Pitot Head to the Stringer for the stainless steel screws.

Disassemble then reseal any machined timber structure.

Pass the flexible clear tube through the rear spar and position it so that it can be pulled through to the outside during fabric covering. Seal the open ends of the Tube to avoid contamination.

Inspect the finished assembly for compliance to the Sketch.

Note that the Pitot Head is fitted to the stringer after the Fabric Covering of the Wing.
8.9 Fit The Aileron / Flap Box Sub Spar. (Sketch WM4, WM4D). Continued

For the Aileron / Flap Box Sub Spar:

Position the Box Sub Spars/Wing as shown on the Sketch WM4, Mark and cut a clearance opening for the Rear Lift Strut Bracket rear edge so that it does not buckle over it.

Reposition and pilot drill the rivet holes through the Aileron Box Sub Spar, Aileron Mount Face to the Rear Spar. These pilot holes shall be at the true dead horizontal centre of the Rear Wing Spar.

Final drill the rivet holes to size.

Pilot drill the rivet holes through the returned edges of the Box Sub Spar into the Rear Spar.

Final drill rivet holes to size in the returned edge of the Box Sub Spar/Rear Spar. Disassemble and deburr

Reassemble. Rivet the Aileron / Flap Box Sub Spar/Wing Spar as shown on the Sketch WM4, WM4D.

*Note the Box Sub-spar can be pilot drilled to match the Aileron Hinge at this point, but do not fit the hinge into position until the Wing has been Fabric covered.
SECTON 9 FABRIC COVERING. (FC)

9.1 All Fabric Cover/Seal Procedures. (Sketches FC1-FC6 apply....See Index for details)

The Fabric Covering shall be carried out in accordance with fabric suppliers manual.

Before commencing the work:

* check that all parts/materials are supplied according to the Kit lists and Sketch.
* check that all parts/materials are free from damage and defects.

Inspect the finished assembly for compliance to the Sketches No FC1-FC6.

The Fabric Cover Procedures are applicable to the following Assemblies:

* Fabric Cover/Seal The Wings. (FC1) -
* Fabric Cover/Seal The Fuselage. (FC2) -
* Fabric Cover/Seal The Vertical Stabiliser/Rudder. (FC3) Do first as trial -
* Fabric Cover/Seal The Horizontal Stabiliser/Elevator. (FC4) -
* Fabric Cover/Seal The Undercarriage Leg. (FC5) Do early as trial -
* Deleted Fabric Cover/Seal The Pilot Door. (FC6) -

NB... If unfamiliar with fabric covering procedures, practice first on a small section to get a feel for it, such as the rudder or elevator.

NB... Before heat shrinking the fabric on the Aircraft, be sure to read page 26 of the Poly Fibre Manual. Most larger Aircraft heat shrink the fabric to 350F, but with the lighter structure of the Supa Pup it is recommended not exceed 300F. From experience 280F to 290F seems to be the best outcome.
ASSEMBLY MANUAL No. Contd

SECTION 10 PAINT FINISHING. (PF)

10.1 Paint Finish Procedures...

We do not go into great detail of preparation and application of products as these details are supplied by the products technical departments.

In all cases make sure that there are not any incompatibility problems between products ie the fabric suppliers sealers will not react with the primer or the timber sealer etc.

Steel framework... Powder Coated

Timber... needs to be sealed to stop moisture absorption and is usually an epoxy varnish but check with the fabric supplier for compatibility.

Fabric Covering... use the specific products as recommended by the manufacturer of the fabric brand you choose, do not mix products.

Fibreglass components... These can be painted using common automotive procedures with good quality products.

Fireproof paints... are available to paint inside engine cowlings if required by the category in which you are building.

Important... always keep paint coats and thickness to a minimum to save on weight and to stop the possibility of flutter inducement due to imbalance from added weight due to too heavy coatings of paint.
SECTION 11  SUB ASSEMBLY (SA)

11.1 Assemble The Ailerons /Flaps To The Wings. (Sketch WM4, WM4C and SM6)

This operation to be carried out after Fabric Coating of the Wings.

Position the Aileron Hinge/Aileron to the Box Sub Spar as shown on the Sketch WM4 with the top edge of the Aileron Hinge fulcrum flush with the top of the Box Sub Spar and with a 0.13” clearance between the Aileron and the Full Wing Rib Caps.

Using the even hole spacings as shown on the Sketch SM6 pilot drill the rivet holes in the Hinge through into the Box Sub Spar. (Do not drill into the Wing Rear Spar).

Make these holes are very neat and not sloppy, this is a critical area, a detached flap or airleon is very dangerous to your prospects of achieving an old age it would most likely be fatal!

If you want to go the extra mile you could rivet (solid rivets) an extra strip into the box sub spar so that the rivets go thru 2 thicknesses of sheet, this issue is why the hinges are full length so as to get maximum strength. Its also a good idea to glue the hinge as well and use flaps conservatively ie no more than 20 deg.

Final drill the rivet holes

Disassemble and deburr all machined surfaces

Rivet the Aileron/Hinge and Flap/Hinge assembly to the Wing Box Sub Spar.

Inspect the finished assembly for compliance to the Sketches.
11.2 Assemble The Lift Strut Complete. (Sketch SA2)

The Slimline Tubes are finished cut to length and mitred. Eight 0.125” pilot holes are pre-drilled in the mating Lift Strut components to ensure that on assembly the Slimline Tubes are presented for the optimum aerofoil effect in flight and the corresponding holes are drilled in the Lift Strut Hinge assembly and Lift Strut Brace/Rod End Tubes.

Using the Sketch, align the existing pre-drilled pilot rivet holes in the Front and Rear Slimline Tubes to the existing pre-drilled holes in the Lift Strut Hinge assembly and the Lift Strut Brace/Rod End Tubes (i.e., Top section of Lift Strut). Check that the Slimline Tubes that are carefully mitred for this assembly, at the Lift Strut Hinge connection, and dressed for clearance at the Lift Strut Brace/Rod End Tubes, are an optimum mating fit.

Pilot drill the remaining rivet holes in the Rear and Front Slimline Tubes through the Slimline Tubes to the Lift Strut Hinge assembly and the Lift Strut Brace/Rod End Tubes. These holes must be in line and at the contact line between the outside diameter of the mating inner tubes and the inner surface of the Slimline Tubes.

Final drill all holes to size.

Disassemble and deburr all machined surfaces.

Rivet the assembly as shown on the Sketch.

Inspect the final assembly for compliance to the Sketch. Note that this assembly must be solid and sound since the Lift Strut is a stressed component of Aircraft and will be subject to both compression and tension effects.

Paint the Lift Strut or leave bare.
ASSEMBLY MANUAL No. Contd

11.3 **Assemble The Stiffener Rib/Port Side Access Panel/Hinge and Leading Edge Strip/Starboard Side Panel.** (Sketch SA3)

For the Port Panel

Cut the Hinge to length and allow for Hinge Pin to be removable.

Position the Stiffener Rib/Port Panel and Hinge/Port Panel as shown on the Sketch

Using the hole spacing shown on Sketch SM14, pilot drill the rivet holes through from the Stiffener Rib to the Panel, and from the Panel to the Hinge.

Final drill all rivet holes.

Disassemble and deburr all machined surfaces.

Rivet the Stiffener Rib to the Port Panel.

Rivet the Hinge to the Port Panel.

Inspect the finished item for compliance to the Sketch.

For the Starboard Panel

Position the Leading Edge/Starboard Panel as shown on the Sketch

Using the hole spacing shown on Sketch SM14, pilot drill the rivet holes through the Leading Edge and the Panel.

Wire the Leading Edge to the Starboard Panel in preparation for Section 12.34.

Inspect the finished item for compliance to the Sketch.
11.4 **Assemble The Pilot Door/Latch/Window.** (Sketch SA4)

The Pilot Door is supplied as a complete welded assembly. The Door Securing Latch mounting bracket is incorporated into the Pilot Door assembly.

Lay out the polycarbonate sheet and mark the profile of the Pilot Door Window as shown on the Sketch SA4. Confirm the profile against the Pilot Door Frame before cutting.

Position the Pilot Window/Pilot Door Frame and pilot drill the holes for the rivets through the Window and to the Pilot Door Frame as shown on the Sketch. These holes shall coincide with the contact line of the Window to the Pilot Door Frame (ie at the centre of the tubing).

Cut Hinge to length

Reassemble and align the Pilot Door/Window to the Hinge. (Note that the Hinge Pin shall be captured but detachable at the rear for removal of the Door as required).

Final drill all holes to size and disassemble

Deburr all machined surfaces complete.

Reassemble and rivet the Pilot Door/Window/Hinge as shown on the Sketch SA4. The O-Rings are required to prevent cracking of the Window sheeting at the rivet holes.

Position the Door Securing Latch as shown on the Sketch SA4.

Drill and shape the mounting hole to size and deburr all machined surfaces.

Assemble the Door Securing Latch/Pilot Door with Bolts/Nyloc Nuts/Washers.

Inspect the finished assembly for compliance to the Sketches.

An additional Vent may be installed in the Pilot Door Window as an optional extra.
ASSEMBLY MANUAL No. Contd

11.5  Assemble The Pilot Window Frame/Latch/Window. (Sketch SA5 )

DELETED

11.6  Assemble The Turtle Deck. (Sketch SA6 and SM17) Continues

Position the Channels to the Turtle Deck as shown on the Sketch SA6.

Pilot drill the rivet holes through from the Channels to the Turtle Deck.

Position Port and Starboard Trailing Edge Cuffs/Turtle Deck as shown on the Sketch. Note the Trailing Edge Cuff to be a close mating fit to the Wing profile.

Pilot drill the rivet holes through from the Trailing Edge Cuffs to the Turtle Deck.

Final drill all holes to size.

Disassemble and deburr all machined surfaces.

Reassemble all components.

Rivet the assembly as shown on the Sketch SA6.

Inspect the assembly for compliance to the Sketches.

Paint the Turtle Deck.
11.7 **Assemble The Wheels/Brakes/Tension Strut/Undercarriage.** (Sketch SA7)

**Cable Operated Drum Brakes**

Fabric Cover/Seal the Undercarriage Leg in accordance with Supa Pup Aircraft Form CF 57/ ('Aircraft Covering Procedure'). **This step may be delayed to the fabric covering stage of the Aircraft.**

Drill through the four outermost holes in the Brake Drum Flange (95mm Pitch Circle Diameter) into the Wheel Flange and recess the inside to create a flat area for the bolt head. Drill the hole for the tube valve stem as shown on sketch SA7 A

Assemble the Wheel / Bearings

( **NOTE ::DO NOT FORGET BEARING SPACER**)

Assemble the Brake Drum to the Wheel Rim and tape over the heads of the recessed Caphead screws to protect the Tyre Tube. DO NOT overtighten as distortion of the drum can occur. Assemble the Tyre/Tube combination to the Wheel Rims/Brake Drums as shown on the Sketch. Approx tyre pressure 12 - 15 PSI.

Assemble the Spring/Spring Retaining Tubes/Tension Strut/Nyloc Nut/Bolts/Washers (ie the Tension Strut Assembly) as shown on the Sketch. Softer suspension can be achieved by chamfering the ends

Fit the Tension Strut Assembly to the Undercarriage Leg Assembly with Nuts/Pivot Bolts/Washers/Cotter Pins as shown on the Sketch and secure with safety wire for later assembly to the Fuselage.

Make a small bracket to locate the brake cable , fit a cable ferrule insuring that the cable will run true to the lever. Ream Brake Hub Backing Plate centre hole to fit over spacer with welded washer, so that pads remain central to Brake Drum. Linish Brake Hub Backing Plate edge, near lever pivot, to clear Brake Drum.

Locate the Brake Hub Assembly to the Undercarriage Leg as shown on sketch SA7, whereby the brake lever arm boss locates in the designated position and bolt the assembly to the finger on the undercarriage leg.

Assemble the Wheel Assembly to the Undercarriage Leg and locate into position with the Tension Strut Pivot Bolt (ready for fitting the Washer/Nut/Cotter Pin later).

11.8 **Assemble The Electrical/Instrumentation Looms.** (Sketch SA8R and SA8J)

Using the appropriate Sketch applicable to the engine type, cut to length and assemble Aircraft Cables/Connectors as shown.

Only approved crimping tools with a valid inspection date and stamp are to be used. Inspect the final assemblies for compliance to the Sketch. Check all Looms for electrical continuity.
11.9 **Assemble The Elevator Control Tube.** (Sketch SA9 and ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Elevator Control Tube.

Cut the Column Tube to length as shown on the Sketch SA9 and position the Bosses/Column Tube.

Pilot drill and final drill the rivet holes to size as shown on the Sketch SA9.

Disassemble and deburr all machined surfaces.

Position the Nylon Bush onto the Column Tube. Assemble the Bosses/Column Tube with selected Adhesive. (Note that the Top and Bottom Fork Ends shall have parallel axes at final assembly). NOTE… the tube must slide through the nylon bush very freely when installed.

Rivet the Bosses/Column Tube complete. Remove excess adhesive from the assembly. The Nylon Bush shall be protected from the adhesive.

Position the Fork Ends to each end of the Bosses/Column Tube assembly as shown on the Sketch.

Pilot drill and final drill all holes to size in the Upper Boss and Upper Fork End. Pilot drill the Lower Boss **but do not drill the Lower Fork End**.

Disassemble and deburr complete all machined surfaces.

Reassemble the Upper Fork End to the Bosses/Column Tube with selected Adhesive.

Rivet complete as shown on the Sketch. Remove any excess adhesive and inspect.

Inspect the assembly for compliance to the Sketches.

11.10 **Assemble The Rudder Control Cables.** (Sketch SA10 and ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Rudder Control Cables.

Assemble the Cable/Thimble/Nicopress sleeve (not supplied as these need to be compatible with the swaging tool used) as shown on the Sketch SA10 and as indicated in Section 3.3 of this Manual.

Cut the Cable to length and assemble the Fairlead Bushes onto the Cable (Five to each Cable). Assemble the opposite ends of the Cable/Thimble/Nicopress Sleeve. Inspect the finished assembly for compliance to the Sketches and subject the finished Cable to a minimum tensile load test as shown on the Sketch. The test shall sustain the load without evidence of movement in the Nicopress joints and the cable shall return to its original length when the load is released.
11.11 **Assemble The Flight Control Torque Tube System.** (Sketch SA11)

Assemble the Control Column/Flight Control Torque Tube complete with Bolts/Nuts/Cotter Pin/Washers as shown on the Sketch.

Ensure that a free full range of unobstructed movement is maintained about the pivot point.

Assemble the Elevator/Aileron stops to the Flight Control Torque Tube as shown on the Sketch (stops to be adjusted on final rigging).

Assemble the PTT (Push to talk) Switch to the Stick Grip as required.

Assemble the Stick Grip/PTT/Control Column.

Shape and match the Flight Control Torque Tube Bearing Blocks/Flight Control Torque Tube.

Wire the matched Flight Control Torque Tube Bearing Blocks to the Flight Control Torque Tube for later final assembly.

Assemble the Forward Elevator Push Tube to the Control Column with Bolt/Nuts/Cotter Pin/Washers and Rod End Bearings as shown on the Sketch. A Rubber Boot of some description, is recommended to cover the top of the Control Column chute, to prevent anything falling into the Control Column.

Inspect the finished assembly for compliance to the Sketch.

11.12 **Assemble the Trim Tab** (Sketch SA12)

Cut Hinge to required length. Position the Top Plate/Hinge/Bottom Plate together and pilot drill through this assembly only from the pilot holes in the Top Plate.

Position the Bottom Plate/Bottom Plate Bracket (align the single hole in the Bottom Plate Bracket with the corresponding hole in the Bottom Plate) and pilot drill through the Bottom Plate into the Bottom Plate Bracket.

Position the Trim Tab/Hinge/Packer/Tab Bracket (align the single hole in the Tab Bracket with the corresponding hole in the Trim Tab) and pilot drill through this assembly from the pilot holes in the Trim Tab.

Final drill all holes to size *except those marked* on the Sketch.

Disassemble and deburr all machined surfaces and rivet complete *except holes marked* as shown on the Sketch.

Inspect the finished assembly for compliance to the Sketch.
SECTION 12 AIRCRAFT BUILD (ACB)

12.1 Mount The Fuselage On The Stand. (Sketch ACB1)

The Fuselage is supplied as a complete welded assembly. The Vertical Stabiliser, Headrack and Pilot Floor Frames, appropriate Tabs/Brackets and Rudder Pedals Lugs are incorporated into the Fuselage assembly.

Position the Fuselage Frame on Support Stands as shown on the Sketch. The Aircraft Frame to be attached to the stands in a secure stable situation.

Ensure that:

* the Aircraft Frame is positioned to allow access to the undercarriage mounting points.
* the Aircraft Frame and any finish that is applied remains unmarked/undamaged.

12.2 Fit The Undercarriage/Remove the Stands. (Sketch ACB1)

Remove the Safety Wire (as requested in Section 11.7) from the Port and Starboard Undercarriage Assembly.

Position and fasten the Undercarriage to the Aircraft Frame as shown on the Sketch. All moving parts shall be treated with Loctite 767 Lubricant.

Fasten the Tail Wheel to the Tail Wheel Spring. Attach the Tail Wheel Spring to the Aircraft Frame as shown on the Sketch ACB1A.

Fit the Bottom Capture Plate to constrain the Tail Wheel Spring

Lift the Aircraft assembly and remove all stands.

Inspect the finished assembly for compliance to the Sketch.
12.4 **Fit The Rudder Control Cables.** (Sketch SA10 and ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Rudder Control Cables.

Lay the control cable in the Aircraft Frame. Position the Fairlead Bushes next to the Fairlead Mounts.

Slide the control cable through the slots in the Fairlead Mounts.

Press the Fairlead Bushes into the Fairlead Mounts with selected Adhesive as shown on the Sketch.

Inspect the assembly for compliance to the Sketches. Ensure that:

* the Cables are able to run free with no evidence of kinks.
* adhesive shall not be allowed to come into contact with the Control Cable.
12.5  **Fit The Elevator Control Tube.** (Sketch ACB5)

Refer Section 12.42 to fully understand the implications for assembling the Elevator Control Tube.

Establish the front and rear of the Elevator Control Tube as shown on the Sketch.

Feed the Elevator Control Tube through the Aircraft Frame Bush Mount.

Press Elevator Control Tube Bush into the Bush Mount with selected Adhesive as shown on the Sketch.

Connect the bottom end of the Elevator Control Tube to the Swinging Arm as shown on the Sketch.

Connect the top end of the Swinging Arm to the Fuselage Tabs as shown on the Sketch.

Inspect the assembly for compliance to the Sketch. Ensure that:

* the Elevator Control Tube is able to swing/slide freely with no evidence of jamming.
* adhesive shall not be allowed to come into contact with the Elevator Control Tube.

12.6  **Fit The Pilot Floor.** (Sketch ACB8)

Confirm that the attachment Nutserts (also known as Rivnuts) are mounted into the Aircraft Frame.

Position the Pilot Floor into the Aircraft Frame as shown on the Sketch. Ensure that all Cables/Controls are clear of the Floor timber.

Fasten the Pilot Floor to the Aircraft Frame. It is appropriate to postpone the fitting of the two rear fixing screws at this stage to allow flex of the Pilot Floor to facilitate the later Fabric Covering of the Fuselage.

Inspect the final assembly for compliance to the Sketch. Ensure:

* the adjacent Electrical Cables/Control Cables are free of kinks.
* the installation of the Cables prohibits any wear or abrasion to the insulation or the Conduit or the Pilot Floor.
* the free operation of the Rudder Pedal/Brake Pedals through the full range of movement, without obstruction.
12.7 **Fit The Brake Pedals/Brake System/Connect Rudder Cables.** (Sketch ACB7)

Make items 4,17 and 23 as shown on the Sketch and drill clamp bolt to provide close fit to the Brake Cable.

Assemble the Brake Pedals to the Rudder Pedals (using Loctite 767 Lubricant) as shown on the Sketch. Drill through from item 23 for the Cotter Pin to provide 0.02” end float.

Assemble the Brake Cables to the Rudder/Brake Pedal as shown on the Sketch.

Feed the Brake Cable through the Aircraft Frame/Undercarriage Leg and to the Drum Brake all as shown on the Sketch.

Cut the Brake Cable to correct length and connect to the Pedals and Cable Clamp Bolt at the Drum Brake Lever as shown on the Sketch. Tie the Brake Cable to the Aircraft Frame to secure and maintain free action.

Assemble the Rudder Cable Tension Spring/Adjusting Plate/Rudder Cable and Rudder Pedal as shown on the Sketch.

Inspect the final assembly for compliance to the Sketch and the braking system for sound operation.
12.8 **Fit The Battery Cables.** (Sketch ACB8) If applicable (optional)

**NOTE… the battery position will be dependant on the wt & bal (fit later)**

Cut Battery Cables to length as required and, insuring cable ends and connectors are well tinned, solder connectors securely to cable ends.

Fit the Positive and Negative Battery Cable through the flexible conduit.

Lay the Positive and Negative Battery Cables in the Aircraft Frame. Fasten these Cables to the Aircraft Frame with the ties as shown on the Sketch.

Inspect the final assembly for compliance to the Sketch. Ensure:

* the Battery Cables are free of kinks.
* the installation of the Cables prohibits any wear or abrasion to the conduit and insulation.

12.9 **Fit The Flight Control Torque Tube And Bearing Blocks** (Sketch ACB6)

Remove the transport wired Flight Control Torque Tube Bearing Blocks from the Flight Control Torque Tube.

Assemble the Flight Control Torque Tube Bearing Blocks/Flight Control Torque Tube complete with Loctite 767 Lubricant as shown on the Sketch No ACB 6.

Fasten the assembly to the Aircraft Frame.

Inspect the assembly for compliance to the Sketch. Ensure that:

* the Control is secure and able to move freely through a full range and cycle with no evidence of jamming.
12.10 **Fit The Trim Control/Trim Control Cable/Connector Springs** (Sketch ACB10 and ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Trim Control.

Run the Trim Control Cable through the Aircraft Frame and exiting at the rear of the vertical stabiliser.

Fasten the Trim Control Cable as shown on the Sketch ACB10. Note that the Bolt (Item 10) of Sketch ACB10 is drilled to suit the cable just below the head of the bolt.

Assemble the Trim Control Lever to the Aircraft Frame as shown on the Sketch.

Assemble the Trim Control Cable to Trim Control Lever. Lubricate the Lever/Cable assembly to ensure free movement of the Trim control.

Inspect the final assembly for compliance to the Sketches. Check the free operation of the Trim Control through the full range, without obstruction.

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**Fabric Cover/Seal the Fuselage/Vertical Stabiliser/Horizontal Stabiliser/Elevator/Undercarriage Leg.**

It is now appropriate to consider the Process for Fabric Cover/Seal of the Fuselage/Vertical Stabiliser/Horizontal Stabiliser/Elevator/Undercarriage Leg in accordance with Supa Pup Aircraft Form CF 57/.

12.11 **Fit The Rudder/Connect Control Cables/Connector Springs.** (Sketch ACB11 And ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Rudder Control Cables.

Assemble the Rudder to the Vertical Stabiliser as shown on the Sketch ACB11. (Note that the movement of the Rudder shall be checked for maximum movement when the Horizontal Stabiliser/Elevator is fitted and a minimum gap of 0.5” shall be set between the extent of the Rudder movement and the Elevator).

Lubricate the Hinges.

Connect the Rudder Cables to the Rudder assembly.

Connect the Connector Springs to the Rudder/Tail wheel as shown on the Sketch ACB11.

Inspect the final assembly for compliance to the Sketches. Check the free operation of the Cable/Rudder/Steering system through the full range of movement, without obstruction.
12.12 **Fit The Horizontal Stabiliser/Support Struts.** (Sketch ACB12)

Position the Horizontal Stabiliser through the Tail Section of the Aircraft and assemble as shown on the Sketch. [Note that the Horizontal Stabiliser shall be set at true horizontal when considering the Port to Starboard aspect and between $0^\circ$ and $1^\circ$ Negative (lower at aft end) when considering the Forward to Aft aspect].

Make and assemble the Support Struts to the Horizontal Stabiliser/Fuselage as shown on the Sketch. Confirm the dimensions before cutting the length and drilling the holes in the Support Strut.

Inspect the final assembly for compliance to the Sketch.

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12.13 **Fit The Horizontal Stabiliser/Elevator and Elevator Control Tube/Elevator and The Elevator/Trim Tab/Trim Tab Controls.** (Sketch ACB13 And ACB5 And ACB10 And ACB42)

Refer Section 12.42 to fully understand the implications for assembling the Elevator Control Tube and Trim Controls.

Fabric Cover/Seal the Elevator

Position the Elevator through the Tail Section of the Aircraft and assemble as shown on the Sketch ACB13.

Assemble the end fitting of the Elevator Control Tube to the Elevator Lever as shown on the Sketch ACB13. Ensure total free movement of the Elevator Control Column assembly.

Lubricate the Elevator Control Tube/Elevator Lever after assembly.

Assemble the Elevator/Trim Tab Sub Assembly as shown on the Sketch ACB10.

Assemble the Horizontal Stabiliser/Clip Bracket as shown on the Sketch ACB13

Connect the Clip Bracket and Trim Tab to the Cable as shown on the Sketch ACB10 (and ACB42).

Lubricate the Elevator Hinge and the Trim Tab Hinge.

Inspect the final assembly for compliance to the Sketches. Ensure…

the free operation of the Elevator and Trim Tab through the full range/s of movement without obstruction, when using the Control Column.

Offer the Fin Root Fairing into position to the Fuselage to prove the correct location of the mounting screws. Drill the Fuselage and the tabs to the root diameter of the fixing screws and fit the Fin Root Fairing to the Fuselage with the fixing screws/washers provided. Grind off the excess length of the self tapping screws that are provided.

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Fit The Fuel Lines From The Fuel Tank Outlet To the Fuel Valve Position. (Sketch ACB14)

Cut the rubber Fuel Lines to length. (Allow for a looped connection to the Fuel Tank when the Wings are fitted and to the Fuel Valve position).

Fit the rubber Fuel Lines to the Aircraft Frame as shown on the Sketch and secure with zip ties.

Note that the actual connections of the Fuel Lines to the Fuel Tanks and to the Fuel Pump will be discussed in Section 12.23 and 12.17 respectively.

Inspect the final assembly for compliance to the Sketch. Ensure:

* the Fuel Lines are free of impurities (Use air blast through).

* the Fuel Lines are maintained in a clean condition by inserting plugs/seals to the open ends of the Lines ready for connection to the Fuel Tanks.

Fit The Battery Mount/Strap. (Sketch ACB15)

Make the Battery Mounts and Spacers as shown on the Sketch.

Assemble the Battery Mounts/Screws/Spacers as shown on the Sketch.(the Bolts pass through the Pilot Floor and connect to the Nutserts in the Aircraft Frame).

Pass the Battery Retaining Strap under both Battery Mounts ready to loop over the Battery as shown on the Sketch.

Mark out the profile of the polycarbonate Battery Cover as shown on the Sketch.

Trim to the required size and mark the fold lines.

Heat the fold line until the Battery Cover material becomes flexible and fold to the required profile. Maintain the shape of the folded material until it has set.

Secure the Battery Cover into the Battery Mount/Rubber Shoes for later Section 12.44.

Inspect the final assembly for compliance to the Sketch.
12.16 Fit The Instrument Panel/Instruments/Radio/Fuel Valve/Switches/Fuse Blocks (Sketch ACB16 and ACB14)

Fit the Instrument Panel Anti-Vibration Mounts to the Fuselage. (Two Studs shall be cut to length to suit the Dome Nuts at the Instrument Panel Face.)

Assemble the Instrument Panel to the Anti-Vibration Mounts as shown on the Sketch ACB16.

Assemble the Tailpiece fittings to the Fuel Valve with ‘Tite-seal’.

Dismantle the Fuel Valve (depending on the type) and clean out any preserving agent. Lightly smear the moving part with grease on reassembly taking care that nothing more than a thin smear is left in the valve.

Assemble the Fuel Valve to the Instrument Panel as shown on the Sketch ACB14 or into the lines depending on the type supplied and connect to the Fuel Lines from the Fuel Tanks.

Install the Radio/Flight Instruments/Engine Instruments of the Builder’s choice to the Instrument Panel. The Company preferred layout is as shown on the Sketch.

Position and assemble Fuses/Circuit Breakers/Switches as shown on the Sketch ACB16.

Fit Slip-Skid Indicator (Manual Turn And Bank Indicator). This Indicator shall be set to 0 degrees with the Aircraft held to a level status.

Inspect the final assembly for compliance to the Sketches.

12.17 Fit The Fuel Pump/Line From The Pump To The Valve. (Sketch ACB17 and ACB14)

Assemble the Tailpieces to the Fuel Pump with “Tite-seal”.

Assemble the Fuel Pump to the Aircraft Frame as shown on the Sketch ACB17. The Fuel Pump shall be primed with Aeroshell W100 Aviation Oil.

Cut the Rubber Fuel Line to length and install the Line from the Fuel Pump to the Fuel Valve as shown on the Sketch ACB17.

Connect the Fuel Hose from the Port and Starboard Fuel Tanks to the corresponding inlet connections of the Fuel Valve.

Inspect the final assembly for compliance to the Sketches. Ensure that:

* the Fuel Lines are free of impurities (Use dry air blast through before assembly).
* the Fuel Lines are maintained in a clean condition by inserting plugs/seals into the open ends of the system as applicable.
12.18 Fit The Firewall/Engine Mount/Wiring Looms and Carburettor Heating Box (Jabiru Only).
(Sketch ACB18)

The Engine Mount is supplied as a welded assembly complete with all appropriate holes.
Never drill into the engine mount.

Position the Firewall onto the Aircraft Frame as shown on the Sketch ACB18.

Pilot drill through the Aircraft Frame to the Firewall for the Engine Mount holes. (Check the
alignment of the Aircraft Frame to the Firewall).

Disassemble.

Final drill the Engine Mounting holes to size in the Firewall.

Deburr all machined surfaces.

Position the Engine Mount and fit to the Firewall/Aircraft Frame with the supplied
Bolts/Nuts/Washers as shown on the Sketch ACB18.

Assemble the Starter Relay/Firewall as shown on the Sketch ACB18.

Assemble the Battery Charge Regulator/Firewall as shown on the Sketch ACB18.

Assemble the Wiring Loom to the Aircraft Frame as shown on the Sketches. Connect all instruments.
(Provide Grommets at the Firewall transition with Hi Temp RTV Sealant covering the Grommets).

Position the Carburettor Heating Box/Heating Box Plate to the Firewall as shown on the Sketch
ACB18 and mark the mounting holes.

Pilot drill the mounting holes through the Carburettor Heating Box/Heating Box Plate and the
Firewall.

Disassemble.

Final drill all mounting holes to size

Deburr all machined surfaces.
12.18  **Fit The Firewall/Engine Mount/Wiring Looms and Carburettor Heating Box (Jabiru Only).**  
(Sketch ACB18 and SA8) Continued

Rivet the Carburettor Heating Box/Heating Box Plate to the Firewall as shown on the Sketch ACB18.

Inspect the final assemblies for compliance to the Sketches. Ensure:

* the Wiring Loom is free of kinks.
* the installation of the Wiring prohibits any wear or abrasion to the insulation.
* an airtight seal is provided between the Carburettor Heating Box and the Firewall.

12.19  **Fit The Choke/Throttle/Carburettor Heating Box Cable (Jabiru Only)/Electrical Connector Panel/Connector Strips/Master Relay.**  (Sketch ACB19)

Assemble the Choke Cable/Throttle Cable/Carburettor Heating Box Cable to the Instrument Panel as shown on the Sketch. (The final connection of the Choke Cable and Throttle Cable is included in Section 12.28 of this manual).

Position the Control Cables through the Firewall Grommets as shown on the Sketch.

Attach the Carburettor Heating Box Cable to the Carburettor Heating Box Cable Clamp and Bell Crank to provide complete open and close action of the Air Entry Valve in the Carburettor Heating Box.

Mark out the holes, profile and fold lines of the polycarbonate Electrical Connector Panel as shown on the Sketch.

Trim the Electrical Connector Panel to the required shape/size

Final drill all holes.

Heat along the fold lines until the Connector Panel material becomes flexible and fold to the required profile. Maintain the shape of the folded material until it has set.

Remove the protective coating and assemble the Connector Strips to the Electrical Connector Panel.

Assemble the Electrical Connector Panel/Connector Strips to the Aircraft Frame as shown on the Sketch.

Fit the Master Relay as shown on the Sketch.

Inspect the final assemblies for compliance to the Sketch.
12.20 Fit The Gascollator (if required) & Fuel Line Through The Firewall.

Remove the plug from the 1/8" NPT port at the top of the Gascollator Body. Replace this plug with a steel top mounting Plug/Stud secured with Tite seal.

Assemble the Reducing Bush/Tailpiece to the Gascollator Housing with ‘Tite seal’ as shown on the Sketch.

Fit the Gascollator/Bracket to Firewall.

Fit the fuel line through the Firewall taking care to properly fit a rubber grommet for protection.

Cut the Rubber Fuel Lines to length as shown on the Sketch.

Assemble the Rubber Fuel Hoses as shown on the Sketch.

Inspect the final assemblies for compliance to the Sketch. Ensure that:

* the Fuel Lines are free of kinks.
* the installation of the Fuel Lines prohibits any wear or abrasion to the rubber or alloy tubing.
* any fuel lines on engine side of firewall are to be fire protected with sleeving or RTV Gasket 26BR Hi Temp Silicon.
12.21 Fit The Headrack/Skylight. (Sketch ACB21) Continues

Position the Headrack Mouldings onto the Aircraft Frame as shown on the Sketch.

Mark and pilot drill the Headrack/Aircraft Frame. (Each side of the Aircraft)

Fit the H section alloy cross beams to firm up the headrack assembly using fibreglass resin & rivets.

Align and position the Pilot Door/Hinge assembly into the Pilot Access opening of the Fuselage. Ensure that the Door Catch secures the Door into position.

Pilot drill through the Headrack/Hinges into the Aircraft Frame.

Final drill all holes to size through the Headrack/Hinges into the Aircraft Frame.

Disassemble and deburr all machined surfaces.

Remove the Hinge Pins and detach the Pilot Door/Half Hinge. This is reinstated at Section 12.22 and Pilot Window/Half Hinge from the Fuselage. This is reinstated at Section 12.40.

Reassemble the Headrack/Half Hinges/Aircraft Frame.

Rivet the assembly as shown on the Sketch.

Measure, mark and trim the profile of the Skylight to suit the Headrack shape.

Mark and pilot drill the Skylight/Headrack as shown on the Sketch. Check the positions before drilling.

Final drill all holes to size in the Skylight/Headrack. The O-Rings are required to prevent cracking of the Skylight sheeting at the rivet holes.

Disassemble and deburr all machined surfaces.

Tinted sheeting may be added to the Skylight at this stage. (not supplied obtain locally if desired)

Fit the Skylight into the Headrack.

Rivet the assembly as shown on the Sketch.

Inspect the final assemblies for compliance to the Sketch.
12.21 **Fit The Headrack/Skylight.** (Sketch ACB21) Continued

If tinting skylight … optional …. 

Remove the protective coating on the Skylight surface to be tinted.

Cut the tinted sheet as shown on the Sketch.

Clean and saturate the Skylight with water/detergent solution.

Remove the backing film on the tinting sheet and apply to the Skylight surfaces.

Remove all trapped air pockets with a glazing squeegee and trim to the final shape/size.

Pierce the tinting film at all rivet hole positions.

Fit the Skylight into the Headrack.

Rivet the assembly as shown on the Sketch.

Inspect the final assemblies for compliance to the Sketch.

12.22 **Fit The Pilot Door** (Sketch ACB22) **Radio Antenna/Coaxial Cable.** (suggestion)

Position the Pilot Door back into the Aircraft Frame and locate with the reinserted Hinge Pin. Note that the Pilot Door may be left off until the final stages of rigging the Aircraft for convenience.

Assemble the Antenna Base/Mount to the turtle deck with a quick detach connector.

Run the Antenna Coaxial Cable from the Radio to the Antenna Mount.

Ensure that:

* the Coaxial Cable is secure and safe.

* the installation of the Coaxial Cable prohibits any wear or abrasion to the outer sheath.
12.23 **Fit The Wings (Note The Wing Rig Angles)/Lift Struts/Fuel Lines/Earth Straps/Aileron/Flap Control Cables.** (Sketch WM5 And WM7 and ACB14)

Position and offer the Port and Starboard Wings to the Fuselage, make sure one Wing is supported whilst fitting the other. Support the Wing to the approximate dihedral angle with props and fit the Hinge Pin into position.

Assemble the Rod End Bearings/Nuts to the Lift Struts as shown on the Sketch WM5.

Assemble the Lift Strut Pivot to the Fuselage as shown on the Sketch WM5.

Assemble the Lift Strut Rod End Bearings/Lift Strut Brackets on the Wings as shown on the Sketch WM5. (Do not rig to the final dihedral at this stage).

Fit the Tailpieces and the Curtis Drain Valves to the Fuel Tanks with ‘Titeseal’ and connect to the Rubber Fuel Line in the Aircraft Frame as shown on ACB14.

Feed the Aileron /Flap Control Cable/Earth Leads into the Aircraft Frame.

Assemble the Aileron Control Cable to the Aircraft Frame/Torque Tube Yoke and to the Aileron Horn/Aileron Horn Flank as shown on the Sketch WM7.

Assemble the Starboard Wing as for the Port Wing. Allow for the Pitot Tube to be fed through the Aircraft Frame.

Inspect the final assemblies for compliance to the Sketches. Ensure that:

* the cables and tubes are free of kinks.
* the installation of the Tubing and Cables prohibits any wear or abrasion to these features or to the Aircraft structure.

Set the dihedral of the Wings by adjusting the Rod End Bearings at the Lift Strut. The dihedral setting of each of the Wings shall be $1^\circ$ positive (raised at the Wing tip).
12.24 **Check The Wing Fold Operation.**

Remove the Retaining Pin from the Port Wing Leading Spar engagement at the Fuselage. Carefully swing the Wing rearward until the Aileron touches the Vertical Stabiliser. It is recommended that the Builder provide a detachable buffer to protect the Trailing Edges at the contact point with the Vertical Stabiliser.

Inspect the Fuel Lines/Control Cables for adequate clearance, free movement without strain and for continuous drainage arrangement of the Fuel Lines.

Swing the wing forward until the Wing Spar engages with the Fuselage. Insert the Retaining Pin and inspect the alignment of the Retaining Pin holes in the Spar to the matching Sleeves in the Fuselage assembly.

Inspect the Fuel Lines/Control Cables for adequate clearance and free movement without strain or kinks.

Inspect the Starboard Wing as for the Port Wing. Include checks for the Pitot Plumbing on the Starboard Wing.

12.25 **Fit The Static/Pitot System Complete.** (Sketch WM8)

These operations shall be carried out after the Fabric Covering of the Wings and Fuselage.

Cut to length and connect tubing to the Static Ports.

Run the Static Tube from the Cockpit to the rear of the Instrument Panel as shown on the Sketch. Connect to all the Static Ports on the Instruments.

Unseal the Pitot Tube which is protruding from the Wing Root and fit the Pitot Tube from the Cockpit to the rear of Instrument Panel as shown on the Sketch. Connect to all Pitot Ports on the Instruments.

Engage the Pitot Tailpiece to the Pitot Head and screw the Pitot Tailpiece to the Starboard Wing.

Apply pressure to the Pitot Head and record the response at the instruments.

Inspect the Static Port and Pitot Head assemblies for compliance to the Sketch. Ensure:

* the Static Port and Pitot systems are free of kinks.

* the installation of the Static Port and Pitot systems prohibit any wear or abrasion to the tubing.
Fit The Pilot Harness (Sketch ACB26) Cabin Upholstery … Optional.

Assemble the Pilot Harness to the Aircraft Frame as shown on the Sketch ACB26 is depicting the single seater but the same principles apply for fitting the two seater.

Optional suggestion… Fit Headrack Tube Padding to the head area, neatly slit along the length to fit the tubes as shown on the Sketch.

Bond the Headrack Tube Padding into position.

Inspect the final installations for compliance to the Sketch. Ensure:

* the upholstery is neat and free of ‘bubbles’.

* the installations have complete bond integrity.
12.27 **Fit The Turtle Deck.** (Sketch ACB27)

Assemble the Turtle Deck to the Aircraft Frame and mark the pilot hole positions through to the Aircraft Frame for the provision of Turtle Deck Camloc Fastener Receptacles as shown on the Sketch.

Pilot drill the holes for the Camloc Fasteners Receptacles (including rivet holes).

Disassemble.

Final drill all holes to size and countersink for the Camloc Fasteners Receptacles rivets.

Deburr all machined surfaces.

Rivet the Camloc Fastener Receptacles into position as shown on the Sketch.

Fit the Camloc Studs/Retainer Washers to the Turtle Deck as shown on the Sketch.

Assemble the Turtle Deck to the Aircraft Frame.

Inspect the final assemblies for compliance to the Sketch. Ensure that:

* the Turtle Deck sits square and true to the structure and aligns with mating components.

12.28J **Assemble The Engine/Engine Mount/Connect Fuel Lines/Choke/Throttle/Carburettor Heating Box Cable (Jabiru Only).** (Sketch ACB28 And ACB19)

Position the Engine with the Anti-Vibration Mounts/Engine Mount and assemble as shown on the Sketch ACB28.

Final connect the Choke/Throttle/Carburettor Heat Cables as shown on the Sketch ACB19.

Cut the Fuel Lines to length and install the Fuel Lines/Fire Protection Sleeves from the Engine to the Gascollator. Note that all Fuel Lines forward of the Firewall shall be sleeved for fire protection with approved material

Inspect the final assembly for compliance to the Sketches. Ensure:

* the cables and tubes are free of kinks.

* the installation of the Tubing and Cables prohibits any wear or abrasion to these features or to the Aircraft structure.

* all controls are smooth and free through the full range of normal operation.
ASSEMBLY MANUAL No. Contd

12.28R Assemble The Engine/Engine Mount/Connect Fuel Lines/Choke/Throttle Cables (Rotax 503 Only). (Sketch ACB44/ACB45/ACB46 And SM-24R)

Attach the Engine Mount to the Fuselage as shown on Sketch ACB44.

Attach Aluminium Engine Mount Plate to the Engine as shown on Sketch ACB45. Note the Stud Assembly required for this operation, is incorporated in the kit from the Engine Supplier.

Position the Engine with the Anti-Vibration Mounts/Engine Mount and assemble as shown on the Sketch ACB45.

Final connect the Choke/Throttle Cables.

Cut the Fuel Lines to length and install the Fuel Lines/Fire Protection Sleeves from the Engine to the Gascoillator. Note that all Fuel Lines forward of the Firewall shall be sleeved for fire protection with approved material

Inspect the final assembly for compliance to the Sketches. Ensure:

* the cables and tubes are free of kinks.

* the installation of the Tubing and Cables prohibits any wear or abrasion to these features or to the Aircraft structure.

* all controls are smooth and free through the full range of normal operation

12.29J Fit The Exhaust/Flexible Ducting. (Sketch ACB29) (Jabiru Only).

Assemble the Exhaust Muffler to the Exhaust Pipes with springs and Loctite 767 Lubricant.

Safety Loc Wire the Exhaust Muffler to the Exhaust Pipes as shown on the Sketch.

Assemble the Heat Cuff to the Exhaust Muffler as shown on the Sketch.

Cut the Flexible Ducting to length and fit as shown on the Sketch.

Inspect the final assemblies for compliance to the Sketch. Ensure:

* the Flexible Ducting is free of kinks or holes.

* the installation does not obstruct any existing systems.
12.30 Connect All Electrical Wiring Forward Of The Firewall. (Sketch SA8R And SA8J)

Connect all wiring in the Main Loom to the Engine as shown on the Sketch.

Connect the Engine Starter Motor and Earth Cables.

Inspect the final assemblies for compliance to the Sketch. Check:

* the Wiring and Cables are free of kinks.

* the installation of the Wiring and Cables prohibits any wear or abrasion to these features or to the Aircraft structure.

* Electrical continuity.

12.31J Install The Engine Oil Breather Bottle/Hose/Calibrate The Dip Stick/Fill With Engine Oil. (Sketch ACB29) (Jabiru Only).

Assemble the Engine Oil Breather Bottle Bracket to the Firewall as shown on the Sketch.

Cut the Engine Oil Breather Hose to length and install the Hose from the Engine Oil Breather to the Engine Oil Breather Bottle inlet.

Cut the Oil Breather Bottle Discharge Hose to length and install to discharge as shown on the Sketch.

Remove the Dipstick from the Engine and mark according to the Sketch instruction. Thoroughly clean the dip stick and reinsert into the Engine.

Fill the Engine with Aeroshell W100 to the desired level on dip stick.

Inspect the final assemblies for compliance to the Sketch. Ensure that:

* the Hoses are free of kinks.

* the installation of the Hoses prohibit any wear or abrasion.
12.32 **Check The Complete Electrical System For Continuity.** (SA8R and SA8J)

Inspect the complete Electrical System for compliance to the Sketch. Check:

* all Earthing Straps for correct resistance (use a Multimeter and record the reading).

* continuity of the entire electrical system. Use an LED test meter or Multi-Meter with Ohms reading to ensure that all connections are secure and correctly connected according to sketch.

Record the results.

12.33 **Fit the Instrument Cowls.** (Sketch ACB33)

Position the Instrument Cowls onto the Aircraft Frame as shown on the Sketch and ensure alignment of the two Cowl halves.

Final drill the rivet holes, that connect the Top Fuselage Cowl halves, to size.

Cleco the Top Fuselage Cowl halves together and make a straight stiffening bracket out of .040” ally to go in between the two framework tubes, it is held in place by final riveting.

Reposition the Top Fuselage Cowl Assembly onto the Aircraft Frame.

Pilot drill the rivet holes through the Instrument Cowls to the Aircraft Frame (including the Instrument Panel Frame) and through the Firewall to the Instrument Cowls. Note that the Top Hinge is incorporated into this assembly on the Port Side only.

Final drill the rivet holes to size. Do not final drill rivet holes that align with the top of the Starboard Side Panel.

Disassemble and deburr all machined surfaces.

Reassemble. High temperature RTV shall be installed between the Firewall and the Fuselage Cowl

Rivet the final assembly to the Firewall and Aircraft Frame as shown on the Sketch. Do not rivet the holes that align with the top of the Starboard Side Panel which is yet to be fitted.

Paint finish (touch up) the rivet heads and any paint finish damage.

Inspect the final assembly for compliance to the Sketch.
12.34 **Fit the Side Panels** [Port (access) and Starboard (fixed)]/[**Bottom Plate**]. (Note that this step refers to Panels/Plates that shall be installed after completion of the Fabric Covering of the Fuselage). (Sketch ACB34) Continues

For the Bottom Plate

Position the Bottom Plate to the Fuselage/Firewall as shown on the Sketch. Note that the bottom returned edge of the Firewall sits under the Bottom Plate leading edge.

Pilot drill the rivet holes through the Firewall to the Bottom Plate.

Final drill the rivet holes to size.

Disassemble.

Deburr all machined surfaces.

Reassemble the Bottom Plate to the Aircraft Frame.

Temporarily clamp the trailing edge of the bottom plate into position ready for the installation of the Side Panels.

Rivet the final assembly as shown on the Sketch.

Paint finish (touch up) the rivet heads and any paint finish damage.
12.34 **Fit the Side Panels** [Port (access) and Starboard (fixed)]/**Bottom Plate**. (Note that this step refers to Panels/Plates that shall be installed after completion of the Fabric Covering of the Fuselage). (Sketch ACB34) Continued

For the Port Side Access Panel:

Cut the Front Hinge Strip to length as shown on the Sketch.

Position the Front Hinge Strip to the Side Access Panel.

Pilot drill the rivet holes through the Side Access Panel to the Front Hinge Strip.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces.

Rivet the Front Hinge to the Side Access Panel as shown on the Sketch.

Position the Side Access Panel/Top Hinge to the Aircraft Frame.

Inspect the open/close operation of the Side Access Panel for the situation when the Front Hinge is engaged and when the Top Hinge is engaged.

Pilot drill the rivet holes through the Side Access Panel to the Top Hinge Strip.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces.

Rivet the Top Hinge to the Side Access Panel as shown on the Sketch.

Reinspect the open/close operation of the Side Access Panel for the situation when the Front Hinge only is offered to position and when the Top Hinge is engaged.

Pilot drill the rivet holes through the Firewall to the Front Hinge Strip.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces (The Top Hinge will need to be disengaged at this stage).
12.34 **Fit the Side Panels** [Port (access) and Starboard (fixed)]/Bottom Plate. (Note that this step refers to Panels/Plates that shall be installed after completion of the Fabric Covering of the Fuselage). (Sketch ACB34) Continued

Rivet the Front Hinge to the Firewall as shown on the Sketch.

Reinspect the open/close operation of the Side Access Panel for the situation when the Front Hinge only is engaged and when the Top Hinge only is engaged.

Mark and pilot drill the holes for the Camloc Studs in the Side Access Panels and the Camloc Fastener Receptacles in the Aircraft Frame Tabs. Note that the Camloc Fasteners shall be at a common alignment for the use of the Top Hinge or the Front Hinge.

Final drill and countersink holes to size in the Aircraft Frame tags for the Camloc Fastener Receptacles.

Deburr all machined surfaces.

Rivet the Camloc Fastener Receptacles into position as shown on the Sketch.

Fit Camloc Studs/Retainer Washers to the Side Access Panel.

Re-engage the Side Access Panel/Hinges to the Aircraft Frame.

Paint finish (touch up) the rivet heads and any paint finish damage.

Inspect the final assemblies for compliance to the Sketch. Ensure that open/close fitting is satisfactory and the Camloc Fasteners are aligned.
12.34 **Fit the Side Panels** [Port (access) and Starboard (fixed)]/Bottom Plate. (Note that this step refers to Panels/Plates that shall be installed after completion of the Fabric Covering of the Fuselage). (Sketch ACB34) Continued

For the Starboard Side Fixed Panel.

Position the Side Panel to the Fuselage/Firewall as shown on the Sketch.

Pilot drill the rivet holes through the Side Panel into the Firewall. Pilot drill the rivet holes through the Fuselage Cowl into the Side Panel and into the Horizontal Strip Tab. Pilot drill through the Side Panel into the Vertical Strip Tab. Pilot drill through the Side Panel into the Bottom.

Final drill the rivet holes to size.

Disassemble and deburr all machined surfaces.

Reassemble the Starboard Side Fixed Panel. High Temperature RTV shall be installed between the Firewall and the Starboard Side Fixed Panel.

Rivet the Side Panel to the Aircraft Frame/Firewall/Bottom Plate.

Note that the Fuselage Cowl overlaps the Side Panel on assembly.

Paint finish (touch up) the rivet heads and any paint finish damage.

Inspect the final assemblies for compliance to the Sketch.
12.35 **Fit The Windscreen/Windscreen Trim.** (Sketch ACB35)

Using the Templates provided position the polycarbonate sheet and mark the pilot drill holes and the profile of Windscreen and Windscreen Trim as shown on the Sketch. The interfaces between the Windscreen and Aircraft structure shall fitted with Rubber O-Rings, to take up the shock load of the Rivets/Bolts to prevent cracking of the Windscreen.

Trim the polycarbonate sheet to shape/size as shown on the Sketch.

Position the Windscreen to Aircraft Frame/Instrument Cowls/Headrack.

Position the Windscreen surface and pilot drill through.

Pilot drill the Windscreen to the Headrack Moulding as shown on the Sketch.

Pilot drill the Windscreen to the Instrument Cowls as shown on the Sketch. When the rivets or bolts are fitted to the Windscreen a washer may be used to compress the Rubber O-Rings.

Finish drill all screw and rivet holes to size

Disassemble.

Reassemble as shown on the Sketch - High temperature RTV sealer shall be installed with the final glazing process.

Rivet the assembly as shown on the Sketch. Remove all excess sealer.

Fit and rivet the front angle section

Paint finish (touch up) the rivet heads and any paint finish damage, a good idea is a black strip around the base of the windscreen where the rivets or bolts are used.

Inspect the final assemblies for compliance to the Sketch.
12.36 **Fit The Wing Tip Fairing/Fairing Infill Panel** (Port and Starboard). (Sketch ACB36 and SM11)

Note… you can leave a full rib here which does away with the need to make the infill panel.

Mark and pilot drill the screw holes for the Wing Tip Fairing as shown on the Sketch ACB36. The screw holes shall be located to engage with the centre of the Wing Rib. (Note: Avoid the positions of existing screws in the Rib Caps)

Position the Wing Tip fairings to the Wings and mark the Wing Rib through the screw holes of the Wing Tip Fairing. Provide a clearance of 0.13” between the Wing Tip Fairing and the Aileron.

Disassemble and inspect the position of the marks and adjust as required.

Core drill (for screws) into the Wing Ribs as shown on the Sketch.

With the Wing Tip Fairing located into position on the Wing Tip Rib offer the Fairing Infill Panel to the Wing Tip Fairing and final mark the final folds for the Fairing Infill Panel, fold to shape and fit the Fairing Infill Panel into position and drill the pilot rivet holes to secure the Panel to the Wing Tip Fairing. (This Panel shall not protrude into the Aileron pocket).

Final drill Wing Tip Fairing/Fairing Infill Panel to size.

Deburr all machined surfaces. Reseal any machined timber structure.

Assemble the Wing Tip Fairings/Fairing Infill Panel to the Wing Rib with rivets and screws as shown on the Sketch. Acrylic latex caulking shall be used to fill the holes in the timber prior to installing the screws at final assembly. Remove the excess caulking.

Paint finish (touch up) any paint finish damage.

Inspect the final assemblies for compliance to the Sketches.
12.37 **Fit The Fin Root Fairing** (Port and Starboard). (Sketch ACB13)

The fin root fairing is made with a capture plate which slips in behind the front tube member and therefore secures it in place without the need for fasteners at the front.

Mark and pilot drill the screw holes in the Fin Root Fairings as shown on the Sketch. The screw holes shall be located to engage with the Aircraft Frame mounting tags, do not drill into the frame tubes.

Position the Fin Root Fairings to the Aircraft Frame and mark the mounting tags through the pilot holes on the Fin Root Fairing.

Disassemble and inspect the position of the mark and adjust as required.

Drill the screw holes in the Aircraft Frame tags to the root diameter of the threads.

Deburr all machined surfaces.

Assemble the Fin Root Fairing to the Aircraft Frame with the screws as shown on the Sketch.

Paint finish (touch up) any paint finish damage.

Inspect the final assemblies for compliance to the Sketch.
Fit and Track The Propeller/Spinner Base/Spinner Cone. (Sketch ACB38)

Ensure that the Magneto switches are off.

Remove the spark plugs.

Match the orientation of the Spinner Base and the Propeller. Note the difference of rotation between the 4 stroke engine and the 2 stroke engines.

Assemble the Crankshaft Flange/Propeller Hub/Spinner Base/Propeller/Pressure Plate/Bolts/plain Nuts/Washers (including Bellevue Washers, as applicable) as shown on the Sketch.

Rotate the Propeller against a fixed datum and measure the run-out difference between the Blade tips.

If a run-out of more than the permissible maximum of 0.06” is found then dismantle the Propeller Assembly.

Reassemble with a packing shim inserted between the Propeller Hub and the Spinner Base. Rotate propeller and remeasure the run-out.

When the Propeller is within tolerance replace the plain Nuts with Fibre Loc Nuts and torque to manufacturers specifications. (This will need to be re-torqued again later) note that the precision of fitting this will dictate it’s life, an out of true / balance or roughly cut out unit will develop cracks.

Fit the Spinner Cone to the Spinner Base.

Install the spark plugs.

Inspect the final assembly for compliance to the Sketch.
12.39 **Conduct The Fuel Flow Test.**

Position Aircraft on stands at appropriate degrees of angle as shown on the Sketch ACB 42.

Fill each Tank with 5 litres of fuel.

Remove the Fuel Line from the Carburettor and direct the Line into a calibrated (in litres) catch can.

Direct the Fuel Valve to the Starboard Tank. Let run via gravity for an accurately monitored 5 mins and measure the amount of fuel that is transferred at the Carburettor Head into the calibrated catch can. Record the result into the Builder’s Journal. Check that it is within current CASA specs. Refer to “Firewall Forward” for full details. Note that flow must be 150% of maximum usage at take off position and under full power. (Figures are 125% for pumped flow).

Direct the Fuel Valve to the Port Tank. Conduct the fuel flow test as for the Starboard Tank and record the result.

Reconnect the Fuel Line to the Carburettor head and run the Fuel Pump (if fitted) to full flow pressure.

Inspect the system for leaks.

Switch off the Fuel Pump

Remove the Aircraft from the stands.

Drain all fuel from the Fuel Tanks/Gascollator complete.

Note that with bigger engines it may be necessary to replace the ¼” fuel lines and fittings with 5/16”

Inspect the final assemblies for compliance to the Sketch.
ASSEMBLY MANUAL No.  Contd

12.40  Deleted  Fit The Pilot Window (deleted Sketches SA5 and ACB22) single seater
12.41 **Fit The Top/Bottom Engine Cowl.** (Sketch ACB41) Continues

Make all Bracket and Hinge Sections as shown on the Sketch. (Note the returns for securing the Hinge Pins in some Hinge Sections and the detachable pins, which will facilitate the steps shown in the following operations)

Align, pilot drill, final drill and rivet all the Hinge Sections/Top and Bottom Engine Cowls and Nut Plate/Bottom Engine Cowl as shown on the Sketch. The final Assembly shall allow for a close fit to the Firewall and no gap between the Top and Bottom Engine Cowls.

Position the Alum Alloy Upper Angle Bracket and Top Engine Cowl to the Firewall to provide for alignment of the Top Engine Cowl to the Firewall.

Mark and pilot drill the rivet holes through the Upper Angle Bracket/Firewall.

Mark and pilot drill the Camloc holes through the Top Cowl/Upper Angle Bracket

Final drill the rivet holes in the Upper Angle Bracket/Firewall. Deburr and rivet the Upper Angle Bracket/Firewall

Position the Engine Cowls (Top/Bottom assembled) onto the Upper Angle Bracket to provide alignment of the Assembled Engine Cowls to the Firewall and secure at the Upper Angle Bracket. Pay attention to propeller hub clearance, allow for flex on engine mounts, 1/4” minimum.

Mark and pilot drill the rivet holes through the Lower Angle Brackets/Firewall and mark and pilot drill the rivet holes through the Vertical Hinge Sections/Firewall. (This is done by reaching through the Propeller Crankshaft opening of the Cowls to mark the position of the Vertical Hinge Section etc. on the Firewall).

Mark and pilot drill the Camloc holes through the Bottom Cowl/Lower Angle Brackets.

Final drill the rivet holes in the Lower Angle Brackets/Firewall, the Vertical Hinge Section/Firewall and the holes for the Camloc Studs in the Top and Bottom Engine Cowls.

Pilot drill, final drill and countersink the holes for the Camloc Receptacles and rivets in the Upper and Lower Angle Brackets as applicable.

Note that it is often the case that the lower rear floor of the bottom cowl needs to be cut away to allow for exhausts and to exit hot air, a glassed on downward lip is helpful a create a suction

Disassemble and deburr all machined surfaces and rivet the Camloc Fastener Receptacles, the Lower Angle Brackets and the Vertical Hinge Sections into position as shown on the Sketch.
12.41 **Fit The Top/Bottom Engine Cowl.** (Sketch ACB41) Continued

Fit the Camloc Studs/Retainer Washers to the Top and Bottom Engine Cowls.

Make any additional openings in the Cowls required to suit the particular Engine installed.

Paint finish (touch up) any finish paint that has been damaged.

Final assemble the Engine Cowls/Firewall and inspect for compliance to the Sketch.

12.42 **Rig The Aircraft Flight Controls.** (Sketches ACB42)

Note: Reduce the length of the Bolts that are used for the adjustment stops as possible once the length of the Bolts is known, as a result of setting the Rigging.

Position the Aircraft Frame to simulate a level flight attitude.

Set the Control Column/Pedals/Trim Tab Lever /Ailerons/Elevator/Rudder/Trim Tab in the neutral flight position.

Adjust the Ailerons to the required angles as shown on the Sketch ACB42 and record.

Adjust the Elevator to the required angles as shown on the Sketch ACB42 and SA11 and record. This adjustment is set when the Lower Fork End is drilled through from the Lower Boss (With the Axes of the Top and Bottom Fork Ends set to be parallel). The assembly is completed with selected Adhesive and rivets as for the Top Fork End.

Adjust the Rudder clearance as shown on the Sketch ACB42 and record.

Adjust the Trim Tab angles as shown on the Sketch ACB42 and record.

Inspect all Flying Controls for sound, free operation and security.

Remove the stand from the Aircraft Frame.
12.43 **Fit The Pilot Seats**
Cut the rear panel sides to sit over the framework, if short just cut enough to locate if tall cut a slot in to nearly the top, it is a good idea to glue a piece of lightweight timber in to support the weight right across instead of just the sides.

Mark and drill the bolt holes in the Pilot Seat as shown on the Sketch. These holes shall be to suit the position for the seat clamps.

Note, before installing the Pilot Seat, it is recommended that a couple material panels be stuck with velcro to the two triangular Fuselage sections under the Seat. This is to prevent anything being able to slide under the Seat, if something were to fall on the floor.

Assemble the Pilot Seat into the Aircraft Frame with Bolts/Nuts/Washers as shown on the Sketch.

Inspect the installation for compliance to the Sketch.

Fit the Cabin Rear Panel into position behind the Pilots Seat.

12.44 **Install The Charged Battery.** (Sketch ACB15)

Check that the Battery is in good condition, has a full charge and is primed to the correct acid level.

Place the Battery in to the Battery Mount.

Position the plastic Battery Cover and secure with the Tie-Down Strap as shown on the Sketch.

Connect the Breather Tube and feed the Breather Tube through the floor of the Aircraft as shown on the Sketch.

Connect the Positive Lead.

Connect the Negative Lead.

Inspect the final assembly for compliance to the Sketch.
12.45  **Ground-Run Test The Engine.** Continues.

Set the Aircraft for a position that simulates horizontal flight.

Fill the Fuel Tanks with increments of five litres of fuel at a time and mark the Fuel Level Gauges at each increment until the Fuel Tanks are full.

Mark the position of the Fuel Level Gauge on the Fuel Tank

Position the Aircraft in the Ground-Run Test Area.

Locate the emergency fire extinguishers in ready-access positions.

Fill the Fuel Tanks with the correct grade of fuel (Ensure that the fuel is adequate to complete the Ground-Run Test).

Inspect the Ground-Run Test Area and remove/secure any loose object that may wash into the Propeller.

Open the Fuel Valve.

Turn on the Ignition Switch.

Advise all personnel in the area of the impending Ground-Run Test.

Give a clear audible warning “CLEAR PROP”.

Start the Engine and cycle the Engine through the Ground Run Test according to the Manufacturer’s Specification.

Record the following for the Ground-Run Test:

* the time of the Test.

* the ambient temperature of the Ground-Run Test Area.

* the maximum attained RPM of the Engine.

* the type and grade of fuel used in the Test.
12.45  **Ground-Run Test The Engine.** Continued

On completion of the Ground-Run Test:

* turn off the Ignition Switch.

* close the Fuel Valve.

* drain the fuel from the Fuel Tanks and inspect the Engine for any leaks or other problems.

12.46  **Final Detailing.**

Transfer the Aircraft to the cleaned and prepared Workshop for any final detailing that may be required.
SECTION 13 FINAL INSPECTION

13.1 Licensed Aircraft Maintenance Engineer

It is a requirement of the Australian Ultralight Federation that for the Aircraft to be registered as an “Amateur Built Aircraft” the following shall be carried out:

* A final inspection shall be undertaken by a level 2 AUF appointed person.
* The appointed person shall be qualified as a Licensed Maintenance Engineer.
* Payment of the expense incurred.

We strongly advise that when you have checked every nut-bolt rod end & fitting yourself, get a qualified Aircraft Engineer to go over everything again.

This finishes the assembly sequences. Follow the engine manufacturer’s running-in requirements according to type fitted.
SECTION 14  SPARE PARTS LIST

14.1 The Spare Parts Catalogue is attached to this Manual and is to be used as a companion document to the Assembly Manual.

SECTION 15  LIST OF SKETCHES  Listed earlier on pages 11A, B & C.

15.1 Sheet Metal Manufacture (SM)  11A
15.2 Timber Parts Manufacture (TM)  11A
15.3 Ailerons/Wings Manufacture (WM)  11B
15.4 Fabric Covering (FC)  11B
15.5 Sub Assembly (SA)  11B
15.6 Aircraft Build (ACB)  11C
15.7 Deleted Sheet Usage Guide (Not Applicable for Fast Build Kit which is now standard)

SECTION 16 OWNER'S RECORD OF EVENTS

16.1 Amendments

16.3 Impressions

16.4 Difficulties of Maintenance/Assembly/Use

16.5 Suggestions for Improvement
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**Other Personnel Involved:**

**Photographs Taken:**

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SUPA PUP AIRCRAFT

ASSEMBLY MANUAL No. Contd

SECTION 17 OWNER’S NOTES
SECTION 17  OWNER’S NOTES