Xair Falcon (UK)
Construction Manual

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Introduction
This manual has been written from information provided by Rand Kar, the French Distributors of the Raj Hamsa kit from India, and knowledge gained from building the first UK version to BCAR Section "S" requirements.
This information is in two parts:

a) This Xair Falcon assembly manual.
b) A set of diagrams illustrating both the component items and their method of assembly

This manual has been used to guide the construction an aircraft, and is therefore offered in the confidence that it will supplement the set of diagrams from Rand Kar.
It is recognised that the skill and experience levels of builders will vary from those who have never built before to those who have constructed other aircraft. It is not possible to write a manual to suit all requirements, but it is hoped that the content level will be sufficient for the novice, and act as guidance for, the experienced builders

Purpose
This manual is provided, together with the diagrams produced by Rand Kar, for the purpose of providing guidance and information to the Kit Builder.

Scope

The Kit.
The scope of this manual is limited to the assembly of the kit purchased from The Wessex Light Aeroplane Company.

Supplementary Information
The manual also contains supplementary information, based on assembly experience, on fitting the remaining items and equipment both necessary, and optional. This includes engine and instruments.

Amendments
Constructive comments to improve the manual are always welcomed The manual will be amended to incorporate improvements and other changes, such as new modifications. These amendments will only be incorporated in manuals issued to builders who buy kits after the amendments have been incorporated. It is not the intention to provide a service to maintain manuals for completed kits. These will be regarded as having served their purpose.

The definitive list of what is approved as “standard” modifications to the build standard is in the current version of BMAA HADS HM5. Anything not listed in there is likely to require a special application to the BMAA technical office.

UK Modifications

The manual includes annexes that list both mandatory and optional modifications. The manual will suggest an appropriate point at which the builder should consider incorporating a UK Modification. The manual will not contain instructions on incorporating the modifications. These are contained in a supplementary book issued by The Wessex Light Aeroplane Company.

Section 1
UK Modifications

Notes.

1. Refer to BMAA HADS HM5 annexes A & B for the official list of mandatory and optional modifications.
2. The points at which UK modifications can be most conveniently incorporated are identified in the text at the appropriate stage.
3. These Modifications and details on how to implement them are contained within the UK Modification Booklet

Paperwork Requirements

Upon receiving your Xair kit, various forms must be completed to register the kit.

1.Obtain form BMAA/AW/022 issue 3 from the BMAA. This is to register kit as a homebuilt and get it's build No. The BMAA will also send you a list of current builders of the same type, a copy of the HADS, and the stage inspection sheets.
The fee for registering is £30.00. You will then have to contact your local senior inspector, as he or she has to sign this form to say that he is prepared to do the stage inspections for you. If you don't know of one, contact the BMAA office.

2. When you receive your paperwork from the BMAA, you will need to fill out the enclosed CAA registration form and send to the CAA with a fee of £45.00.

3. Upon completion of the project you will need a permit to fly, which is available again from the BMAA. Fee £90.00

Important Note

It is essential that the current copy of the British Microlight Aircraft Association (BMAA) Homebuilt Aircraft Data Sheet (HADS) For the Xair No. HM5 is available to the builder.
This can be obtained from the BMAA at:
The Bullring, Deddington, Banbury,
Oxford. OX15 0TT
Tel No. 01869 338888

Section 2
Preparation

1 The first stage of inspection by the BMAA Inspector will include, amongst other things, an examination of the area prepared for the build process.

2 Before the kit arrives it will be necessary to prepare the construction area. This will include:

a) Ensuring that there is sufficient space for the fuselage and wings
b) Lighting levels are adequate
c) The area is clean and dry with protective packaging available on the floor, as items are unpacked.
d) The required tools are available

Section 3
Unpacking

Notes:

1. It is suggested to put down some form of floor covering to provide protection to the tubing etc.
2. All items should be stored in their original packaging until required for use.
3. The use of a battery-powered screwdriver is recommended to remove the screws, which secure the lid on the wooden crates.

Unpacking

a) Position the long container in the construction area.
b) Open the container and carefully unpack the kit, noting and checking the contents against the inventory on the packing list.
c) Visually inspect each component for damage.
d) Stow all items in a safe location where they will be protected from any damage during the construction process.
e) Note any discrepancies and if found, Contact the Wessex Light Aeroplane Co. Details on the front of this manual.
f) Position the remaining container in the construction area.
g) Repeat Stage b) and replace items in the container, or completely unpack as required.

Contact BMAA Inspector
to perform Stage Inspection Number 1 and sign off

Section 4
Tools and consumables

Tools

You will need the following tools:

- Nylon or Robber tipped hammer
- 7, 10, 13, 14, 17, 19mm sockets or ring spanners
- Torque wrench (advisable but not essential)
- Pop rivet gun
- Drill and 4,5,6 and 8-mm HSS drill bits
- Screwdrivers, crosspoint and plain
- Various metric Allen keys

Consumables

- Removable Loctite or similar thread locking compound.
- Silicone grease
- Nylon Lubricant

Some of the Additional Items not included that you will need to purchase

- 1/8 inch or 3mm pop rivets.
- 2 lengths Black Armaflex Pipe Insulation 28 x 9mm (plumbers)
- 6 to 8mm PVC or similar tubing for the Pitot / Static head (2 x 5m)
- Battery Box – available from the WLAC
- Flame retardant 6mm ID Fuel Hose (4m) Do not use PVC or Polyurethane.
- Nylon Mesh type Fuel filter.
- In Line Fuel Cock to suit 6mm ID Fuel Pipe
- Primer Bulb – Type suitable for Microlight use with a failsafe non-return valve.
- Fuel Pipe clips – Size to suit outside diameter of fuel pipe used.
- Pieces of aluminium sheet approx 1mm thick. 6063, 6082 or similar spec.

Section 5
Airframe Assembly

References to the picture/drawing manual are given were applicable. These are not necessarily in the same order as in that manual. This is due to the different build sequences and various UK Section 'S' modifications and requirements etc.
It is necessary to cross check with the UK Modifications Manual during the build and incorporate any modifications required.

Identify the following items and remove their packaging. Carefully examine each item.

Items	Part Number	Qty
Main Axle Assembly with fasteners	211	1
Engine supporting tubes with plug	238	2
Front roll bars with plug	239	2
Rear roll bar with plug and fasteners	240	2
Tail Support Tubes	241	2
Floor tubes with plugs	242	2

a) Set these items to one side, to prevent any damage.
b) Place the Main Axle Assembly (211) oriented in the direction chosen for the build process.
c) Refer to diagram A1. You will note that the Main Axle Assembly has three pairs of tube receptacles and two pairs of mounting brackets, (a pair at each end)

Fitting the Floor Tubes (242).

a) After noting the positions of the bolts in the forward tube receptacles, remove the nuts, withdraw the bolts, and set them aside.
b) Position one of the Floor tubes (242) with the end fitted with a plastic blanking plug to the front. Insert the other unblanked end into starboard forward tube receptacle. Turn the Floor tube until the pre-drilled holes are aligned and insert a bolt ensuring that the threaded portion is inboard. Refit the nut finger tight.
c) Repeat this operation to install the Floor tube on the port side. Do not tighten the nuts at this stage.

Fitting the Engine supporting tubes (238).

a) After noting the positions of the bolts (above and adjacent to Floor tube fitting 242), remove the nuts, withdraw the bolts, and set them aside.
b) Hold the first Engine supporting tube (238) so that the plugged end is uppermost and engage the lower end into the bracket. Refit the bolt and finger tighten the nut. **N.B.** It is suggested to put a washer each side of the tube. To prevent bending in brackets when tightening bolts.
c) Repeat for the other engine support tube.

Fitting the Front Roll Bars (239)

a) After noting the positions of the bolts in the forward tube receptacles, remove the nuts, withdraw the bolts, and set them aside.
b) Hold a Front Roll Bar (239) so that the plugged end is uppermost and engage the lower end into the bracket. Turn the Roll Bar until the pre-drilled holes are aligned. Insert the bolt ensuring that the threaded portion is inboard. Refit the nut finger tight.
c) Fit the second Front Roll Bar on the other support bracket. Insert the bolt ensuring that the threaded portion is inboard. Refit the nut finger tight. The pilot's side (port) only will have a plastic bushing used for retaining the throttle cable, which will be fitted later.

N.B. This is the best time to fit the Armaflex Insulation to these tubes.

Fitting the Rear Roll Bars (240)

a) After noting the positions of the bolts and seat belts in the rear tube receptacles, remove the nuts, withdraw the bolts, and set them aside.
b) Hold a Rear Roll Bar so that the plugged end is uppermost and engage the lower end into the bracket. Turn the Bar until the pre-drilled holes are aligned Insert the bolt ensuring that the threaded portion is inboard. Refit the seat belt and fittings, finger tighten nut.
c) Fit the second Rear Roll Bar on the other support bracket. Insert the bolt ensuring that the threaded portion is inboard. Refit the nut finger tight.

Fitting the Tail Supporting Tubes (241)

a) Refer to A4 after noting the positions of the bolts and seat belts in the rear tube receptacles, remove nuts, withdraw the bolts, and set them aside.
b) Engage the lower end of the Tail Supporting Tube (plugged end goes to tail, (brackets up)) in the bracket and refit the bolt, and add washers each side of the tube to take up the difference between size of tube and distance between the brackets, whilst ensuring that there is no load bearing on the threaded portion of the bolt. Hand tighten the nut. Ensure that you have fitted the bolt with the nut on the inside.
c) Fit the Tail Supporting Tube on the other side.

Assembly of Keel Forward and Aft Sections 201 and 202

Preparation. Identify the following items and remove their packaging. Carefully examine each item. Refer to diagram A2.

Items	Part Number	Qty
Keel front part Assembly with fasteners	201	1
Keel rear part Assembly with fasteners	202	1
Fin Tube	219	1
Aileron cables	234	1

Note. The forward and aft sections are marked at the factory with alignment markings. Identify these now. Ensure that you fit these two assemblies so that these marks align exactly.

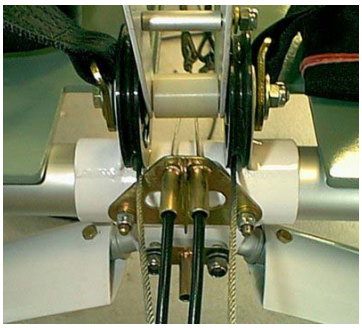
Caution. The front Keel Section is long and relatively heavy. It is recommended that you have the assistance of a helper to prevent damage in moving and positioning this item.

a) Remove the 6mm diameter bolt from one of the keel sections
b) Examine both Keel sections and ensure that all and any swarth or other loose material is removed + de-burr the holes. Carefully assemble the two sections, observing the alignment marks.
c) Re-fit the 6mm bolt, and engage the nut finger tight. See A2D
d) Fit and secure a 4mm pop rivet into the pre-drilled hole in the top of the Keel assembly.
e) Add a further two pop rivets to the brackets fitted at this point.

Caution – Safety Note You are now to fit the whole Keel Assembly to items 238, 239, 240 and 241. If mishandled, there is a risk of injury or damage. It is strongly recommended that you have assistance for this stage of the process.

Fitting the Keel Tube Assembly to the Supporting Struts.

a) Refer to diagram A2 and then study the illustrations A2A, A2B, A2C, A4A Note the Assembly details.
b) Remove all the bolts, saddle washers etc. on the keel at points A2A, B, C and A4A Set these aside.
c) With a helper taking the weight, fit the bolt through the top holes in one of the front roll bar (239). Re-fit a saddle washer, Pass the bolt through the Keel and fit the saddle washer on the other side. In turn, pass the bolt through the other front roll bar and fit the washer and hand tighten the nut.
d) Carefully maintaining the Keel Assembly in this position, refer to diagram A3 and remove the fittings 219110 from fin tube 219 and insert into the end of the keel tube.
e) With a large saddle washer each side of the keel, locate over the end of the 8mm threaded rod, the tail support tubes 241 with small saddle washers on each side. And temporarily fit the nuts.
f) Refer to diagram A2A and fit engine support tubes 238 in a similar manner.
g) Fit Aileron cables bracket to axle 211 as shown in A2E
h) Remaining tubes 240 can now be attached to the keel along with the Upper Aileron cable brackets (Refer to A2C & A5) and plate 102130. Do not tighten bolts at this time.



Note's:- *Fit a 6mm washer between Aileron cable brackets and tube 240.*
The Aileron cables must cross over from exit position on bracket fitted to axle 211.
The plate 102130 lower holes will be drilled at a later stage.

i) Flap lever assembly 262 can be fitted to the keel at this time diagram A4B.

Referring to the Falcon Modification Booklet incorporate modification number 1

Fitting the Front Fork Assembly

Note **"If a Rotax 912 is being fitted then to comply with weight restrictions"**
LIGHTWEIGHT ALUMINIUM WHEELS NEED TO BE INSTALLED.

Preparation. Identify the following assemblies and remove the packaging. Carefully examine each item. Refer to and study diagrams A6 and A6A

Items	Part Number	Qty
Nose wheel tube assembly with fasteners	208	1
Fork Steering Bellcrank with fasteners	209	1
Front fork assembly with fasteners and spacers	210	1

Note. The shaft of Front Fork assembly will have to rotate with rudder movement within the bearing of the Fork Steering Bellcrank 209 and the Nose wheel tube assembly 208. It is essential for both smooth rudder operation and long life that the shaft is as smooth as it can be. (use wire wool or similar if necessary). When the shaft is fitted in to the Fork Steering Bellcrank 209 and the Nose wheel tube assembly, lubricate the shaft with a nylon suitable lubricant (available in Halfords)

a) Align the top of the Nose wheel tube with the mounting bolts on the Keel tube and re-fit the bolts. Finger tighten the nuts.

b) Remove the long bolt. Align the Nose wheel tube fitting holes with the floor tubes 242 and insert the bolt, ensuring that the spacers are fitted correctly. Finger tighten the nut.

N.B. If you are working on your own, you may find that it is difficult to line up the holes with the bolt. One method used, was to fit an **X** shaped car wheel brace, into the place where the front forks go and use a twisting action on the nose wheel tube, to help line up the bolt with the hole.

c) Ensure that there is sufficient space between the bottom of the Nose wheel tube assembly and the working surface area.

d) Slide the shaft of Front Fork and Fork Steering Bellcrank into the Nose wheel tube assembly. Ensure that the stops on the bellcrank are pointing aft and the bolts are uppermost. Ensure that the Front Fork assembly is free to rotate within its limits.

Notes:

1. It is important to understand that three items are to be aligned to each other. These are the:
   - The Nose wheel tube assembly 208
   - The Fork Steering Bellcrank part. 209
   - Front Fork assembly 210

2. At a later stage, the two Steering link rods will be fitted and connected.

a) First align the Fork Steering Bellcrank part 209 to the Front Fork assembly by sighting down from above the Nose wheel tube and rotating the Fork Steering Bellcrank until it is correctly aligned.

b) Lower the Airframe to rest the shaft of Front Fork assembly on the ground. This will ensure that the shaft is positioned fully home in the Nose wheel tube.

c) Now carefully rotate the Nose wheel tube assembly to align with the Front Fork assembly. Check again that all assemblies are aligned.

d) Draw lines, using a permanent marker pen, across the interfaces of all assemblies. (These lines will enable any movement out of alignment to be detected during the subsequent drilling process.) Centre mark and drill an 8 mm hole through the nylon bearing at each side in turn, carefully monitoring the alignment marks. This process should mark the shaft on both sides of the Front Fork assembly.

e) Remove the Front Fork assembly, and carefully complete drilling the 8 mm hole. Remove all swarth and file smooth any rough edges.

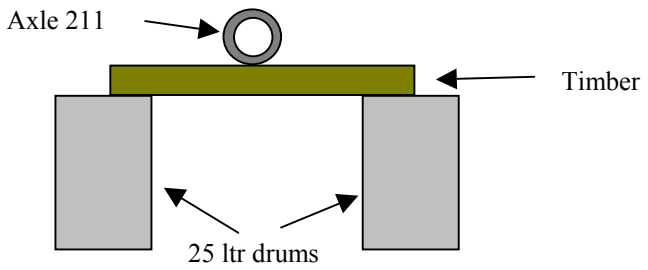
f) Temporarily re-fit the Front Fork assembly (it will have to be removed again to fit the Pod). Fit the 8-mm bolt, finger tighten the nut.

Fitting Main Undercarriage

Preparation. Identify the following assemblies and remove the packaging. Carefully examine each item. Refer to and study diagrams A7, A11

Items	**Part Number**	**Qty**
Tension leg assemblies with fasteners left and right (Wheel axles)	213	2
Compression legs with fasteners left and right	214	2
Rear shock absorbers	248	2
Front floor support tube / with Rudder Pedals	258	1

Note. You will need to raise the airframe high enough to allow fitting of the undercarriage components. One method is to use two 25 litre drums, placed on either side of the airframe with a 4" x 2" piece of timber sitting across the top of them, and then rest the axle 211 on top. (under the wing strut plates) see below. **Ensure, for safety, that the assembly is secure and cannot topple or fall.**



a) Fit the Tension leg assemblies 213 to the Main axle using the bolts supplied, Finger tighten the nuts. **N.B.** It is suggested to fit a 6mm washer between the bracket & tube to take up the gap.
b) Fit the Rear shock absorbers to the Tension legs. It is recommended that spacing washers be fitted to each side of the shock brackets to prevent bracket distortion when securing the nut and bolt.
c) Lift into place on the Main axle 211. Hand tighten the nuts.
d) Separate the rudder pedals from the front floor support tube, and temporarily fit this tube in place through the holes in 242
e) Position the Compression Tubes 214 with the pin and ring ends pointing forward and temporarily attach to the front support tube. Connect the other ends, with the nuts & bolts, to the Tension legs.

N.B. These Compression Tubes will have to be removed later to fit the Pod.

Installing the Main Wheels

Preparation. Refer to diagrams A11 and A11A.

Items	**Part Number**	**Qty**
Front wheel with tyres, tubes and bearings	229	1
Rear wheels with tyres, tubes and bearings	230	2

a) Carefully remove the brake drum back plate, from the wheel and note the orientation of the long spacer tube. It has a locating ring at one end.
b) Refer to diagram A11A. Slide the back plate onto the wheel axle, noting it has a location hole for the prong protruding from part 213. The back plate must be fully pushed home, so that it is tight against the spacer and sitting square.
c) Slide on the drum to wheel spacer tube, (smaller diameter end, (ring) fits towards back plate).
d) Slide on the wheels and fit the retaining bolt & washer.
e) Check the free movement of the wheels, and the operation of the brake levers. Fit front wheel 229 into the fork, with a spacer on each side of its axle.
f) The fuselage structure can now be lowered onto its wheels.

N.B. The next stage of work is very important. It will determine the vertical alignment of the Fin &Tailplane to the Aircraft. Ensure that you take the greatest care with this part of the assembly process.

a) Referring to A5 & A5A It will be necessary to ensure that the Fin Tube is at a right angle to the Axle assembly. If you are competent, stand to the rear of the Airframe and sight the vertical alignment (perpendicular) of the fin tube to the Axle 211. Alternatively place a spirit level on the Axle assembly and ensure that the Axle is exactly level. Then, again using a spirit level, check the Fin tube for vertical alignment. Apply a gentle twist to the Fin tube 219 to alter if not correct.

b) When all is correct, Clamp the plate 102130 diagram A5 to the adjacent supporting tubes 240.

c) Carefully drill (6mm bit) through the tube 240 and mark the plate. Similarly drill and mark the other side. Place a piece of masking tape, or mark the plate on one side, so as not to lose the correct orientation, and temporarily remove the plate.

d) Complete the drilling of the two holes in the plate, taking care to remove any burrs or rough edges.

e) Re-fit the plate (look at your marks to preserve the same orientation) and all fastenings, fit washer between plate and tube.

Note. At this stage of assembly, you can fasten all nuts & bolts previously installed and finger tight, except anything marked temporarily above. i.e. Rear attachment 241, front fork 210 & compression tubes 214.

Fitting the Floor Assembly 250

Note **"If a Rotax 912 is being fitted then to comply with weight restrictions"**
A LIGHTWEIGHT CARBON FLOOR NEEDS TO BE INSTALLED.
Substitute this for part No. 250

Preparation. Identify the following assemblies and remove the packaging. Carefully examine each item. Refer to and study diagrams A7A to A8D.

Items	Part Number	Qty
Wooden Floor	250	1
Control column assembly	259	2
Under seat tube with U brackets	243	1
Rudder pedal Assembly	258	1
Throttle Lever assembly	260	1

a) Position the wooden floor into position.

b) Position the front Under-seat Tube 243 (with U brackets) to align the mounting bolt holes with the corresponding holes in the floor.

c) Insert a mounting bolt through the floor, as shown in diagram A8B, passing through one side of the U bracket, through the floor tube and the other part of the U bracket. **Note** It is normal to have to pull in the two floor tubes to get the bolts located.

d) Place the rudder support base assembly to locate the long bolts through the floor and the forward support tube. A7A & A8A

e) Locate the rudder bars in place, ensuring that the brake pedals are fitted to the left (port) side. Fit the nuts and washers but do not tighten. **Note** that the position of pedals fore and aft does not matter.

f) Secure the floor to mounting tubes 242 and 243 with medium size cable ties. Loosely fit large cable ties to attach floor (aft end) to the Main Axle 211.

g) Fitting the control column base assembly 259. As supplied, the bolts may be inverted in this assembly. All bolts, when assembled must have the nuts at the bottom. (It is recommended that you drill the 8mm bolts for a split pin.) If necessary, remove and refit the bolts. Before taking the assembly apart, make a careful note of its construction, particularly in regard to the location of the spacing pieces and the pulleys red spot. (facing down)

h) Carefully separate the control column base assembly 259, to fit the two mounting plates above and below the wooden floor. The fitting location is identified by the position of the holes in the floor. Carefully refit the securing bolts, distance pieces and pulleys in place, along with the aileron cables. Tighten all nuts. See diagrams A7B & A8D.

i) Do not fit sticks at this time.

j) Temporarily fit the throttle levers. (you will have to drill the tube for the right hand lever) slide on the right hand lever, and mark with a pencil its position on the tube, so that there is no sideways movement. See diagram A7C. Remove the assembly from the floor. And remove the existing bolt in the left hand lever.

k) Remove the bolt from the left hand lever, lay the throttle levers flat on the wooden floor (or similar flat surface) and slide on the tube, lining up the original hole with the left hand lever. Adjust the right hand lever position so that it lines up with the pencil mark. (you should now have two throttle levers that are parallel to each other, with the correct spacing in between for the mounting blocks).

l) Mark the position on the tube, through the hole in the right hand lever, remove the tube and drill a 6mm hole.

m) Re-assemble the throttle assembly in its position on the floor. The heads of the bolts will face the seats.

Note: Incorporate UK Modification Number 11 at this time. (On some later Kits this may not be required as it is pre fitted).

Fitting the Rudder Control cables.

Preparation. Identify the following assemblies and remove the packaging. Carefully examine each item. Refer to and study diagrams A8C, D, E and F.

Items	Part Number	Qty
Set of control cables	234	1

a) Lay out the rudder cables so that the shackle is at the aft end.

b) The rudder cables will have to be threaded through the gap between the pulley and the main axle A8C, you may have to partially remove the pulleys to open a gap at one side. (one method is to insert a screwdriver, as you withdraw the bolt. This will allow you to tilt the pulley assembly enough to slide the cables down the gap.) Take great care not to lose any spacing washers nor change the orientation of the pulleys. There is a possibility that when the bolt is withdrawn, the installation sequence of pulleys and spacer washers may be lost. This will certainly be the case if you drop them! If this does happen, the installation sequence is:- *Bolt and large thick washer, through seat belt anchor and bracket, three washers, pulley with rudder cable, two washers, elevator rod bracket, spacer, elevator rod bracket, two washers, pulley with rudder cable, three washers, through bracket and seat belt anchor, large washer and nut on other side.*

c) Tighten bolts just enough to allow the elevator rod bracket to move freely.

d) Temporarily fit the cables to the rudder pedals.

e) After first **crossing** the rudder cables A8F, fit the cables over the pulleys on the keel tube. A8E

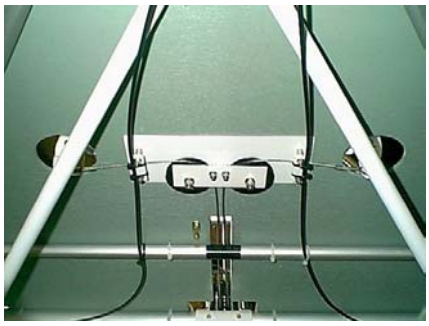
Note. It will be necessary, as before, to partially remove the pulley wheels to locate the cables. Take great care not to lose any washers and ensure that the pulley wheels have the red dot facing out. **IMPORTANT, Bend down the cable guides so that the rudder cables cannot get off the pulley wheels.**

Connecting the Brake Cables

Preparation. Identify the following items and remove the packaging. Carefully examine each item. Refer to and study diagram A9

Items	Part Number	Qty
Brake cables	228	2

a) Withdraw inner cables from outer sheaths and thread through rudder pedals and cable guides. Refit outer sheaths and route under the floor, exiting through the top of the shock mounting.
b) Thread through brake adjuster on brake drum, wrap around lever and tighten the bolt.
c) Ensure that cables are routed under floor to maintain a large radius curve where they leave the brake pedals. Attach cables using cable ties, (taking care not to over tighten) to convenient points beneath the floor.
d) Adjust cables so that the slack is just taken up. Check brakes operation and cut inner cables to length. It is Required that the newly cut inner cable ends are covered with a piece of 3mm heat-shrink tubing to prevent splaying of the strands.



Installing the Elevator Tube Assemblies

Preparation. Identify the following assemblies and remove the packaging. Carefully examine each item. Refer to diagrams A12 and A12A, A12B and A12C.

Items	Part Number	Qty
Elevator control tube assembly with fasteners	207	1
Elevator tube front part assembly with fasteners	217	1

UK modification number 2. *This modification affects several of the nuts and bolts used to secure the elevator tubes 207 and 217. Study this modification now and incorporate the split pins as shown. Do not incorporate the modification until final assembly of these bolts.*

Note: Incorporate UK Modification Number 21 before installing part 207.

a) Position the Elevator tube front part assembly 217 as shown in diagram A12A Ensure that the trim lever is on the port/pilot's side.
b) Fit and tighten the front bolt to allow free movement of the elevator controls.
c) Connect the rear of the tube as shown in diagram A12B. Fit and tighten the rear

bolt to allow free movement of the elevator control fore and aft

d) Position the rear of the Elevator control tube assembly 207 as shown in diagram A12C. Fit the bolt/nut but do not tighten.

e) Connect the front of the Elevator control tube to the fitting as shown in diagram A12B. Fit and tighten the front bolt to allow free movement of the elevator control fore and aft.

Installing the Seat Tube 212

Preparation. Identify the following item and remove the packaging. Carefully examine. Refer to diagram A13

Items	Part Number	Qty
Seat back tube with fasteners	212	1

a) Position the Seat back tube 212 as shown in diagram A13 and fit bolts through the side brackets, do not tighten the nuts. These nuts will have to be removed again to enable the fuel tank securing straps to be fitted

b) Attach elevator stop cable to centre bolt on front of tube 212. Do not tighten.

Fitting the Seats

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagram A14

Items	Part Number	Qty
Seats	251	2

a) Position the first seat and carefully release all the Velcro strips and move seat cover and foam rubber aside to give access to the bolt holes.

b) Fit four bolts (it is advisable to fit “penny” washers, under the bolt heads and nuts to prevent crushing) through the seat base and push these through the pre-drilled holes in the floor.

c) Fit the corresponding penny washers and nuts from below the floor. Do not tighten the nuts yet.

d) Fit the bolts through the seat backs into tube 212.

Note: Incorporate UK Modification Number 9 at this time.

e) Check that the seat is correctly positioned and tighten the seat bolt nuts. To prevent damaging the fibreglass seat shell do not over tighten these nuts.

f) Refit the seat cover and secure the Velcro strips.

g) Repeat steps a) to f) to fit the other seat.

Fitting the Fuel Tanks.

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams A15, A, B and C.

Items	Part Number	Qty
Fuel Tank assembly	224	2
Set of webbing	233	1
Set of hoses	235	1

Note: Incorporate UK Modification Number 3 & 4 at this time.

a) Open pack 233 and identify the four tank securing webbing straps. Set these aside.
b) Study diagram A15 and note the positions of the fuel tanks.
c) Refer to diagram A15A. Remove the washer and bolt shown, fit the securing cable and refit the washer and nut.
d) Refer to diagram A15B. Remove the washer and bolt shown, fit the securing cables of both tanks and refit the washers and nuts.
e) Fit the Link tube between the two tanks
f) Study the webbing strap buckle and ensure that you understand how fit the strap so that it can be tensioned and remain locked by the buckle.
g) Fit the four straps over the axle and beneath the floor. Do not tighten the straps.
h) The tanks should now be hanging in position.
i) It is Required that some foam rubber be installed between the tanks and the seat backs to prevent chafing.
j) Tighten tank straps, and you can now tighten the rear floor cable ties.
k) Install the fuel tank vent pipes.

Note. If desired, the fuel pipe run may be installed at this point in the construction. The access is easier than later in the construction. Final installation may be completed later when the engine is fitted.

Fitting the Fin cover & Tailplanes
Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams B1, A, B & C B2 A, B, C & D

Items	Part Number	Qty
Vertical fin cover	236229	1
Top fin leading edge tube	244	1
Fin lower tube	245	1
Tailplanes	252	2

Notes:

1 You will need to add ballast to the front of the airframe to counterbalance the weight of the tail assembly. If you have an engine, this could be lifted into position.
2 The Vertical fin cover is enclosed with the wing and fuselage cover. Note that it

made of two triangle shapes. It will be fitted with the larger triangle at the top. See diagram B1.

3 The Fin tube 219, 8mm bolt/studding securing tail tubes 241 previously temporarily fitted, will have to be removed for this process. It will be necessary to remove all the fittings on the lower half of this tube 219.

a) Examine the Fin Cover and note the correct orientation for fitting. Refer to diagram B1 and slide it forwards over the fuselage tube.
b) Refit the fin trailing edge 219 inside the fabric from the top, refit the 8mm bolt/studding, saddle washers and tubes 241.
c) Refer to diagram B1B. remove the bolts and plastic spacers.
d) Examine the top fin leading edge tube 244, note which end has the threaded insert fitted, this is at the top. Slide tube inside fabric.

Note The bolt on the top of the fin tube 219 which secures tube 244 also is used to support the tailplane upper cables. B2B This bolt could be removed again later to fit these cables, but we have found that it is best to include them now. This is because tube 244 will be under tension once the fabric is fitted, making removal/re-fitting of this bolt difficult.

e) Locate bolt through hinge and upper tailplane cables through 219 and pick up a few threads in tube 244. Leave loose for now.

Note
Unfortunately the tailplanes will be hanging loose for now, try to secure them some way until the next few steps are completed. Also make sure the fin fabric is hooked over the end of the keel tube before proceeding.

f) Position the forward end tube 244 between the brackets shown in B1B
g) Fit the bolts and saddle washers, if needed use a screwdriver, or similar metal rod, align the tube between the brackets.
h) Fully secure the bolt at the top end of the tube.
i) Insert the lower tube 245 forward from the aft end.
j) Fit the forward bolt and finger tighten the nut.

Note. It will now be necessary to fit a supporting block underneath keel tube at the rear. This block will be needed to prevent the tube moving when a downward force is applied to the lower tube 245. Assistance with this operation is desirable.

k) With the supporting block in place, force the aft end of tube 245 down until it can be moved across into alignment with the bottom of the fin tube 219. This operation will tension the lower fin cover material.
l) The lower fittings previously removed may now be replaced. B1C. Do not tighten nuts at this stage.
m) Replace all the brackets removed from fin tube 219 and locate the tailplanes between brackets as shown in B2A & B.
n) Remove upper bolt from lower brackets, as shown in B2D, and fit lower tailplane cables.

Note: Incorporate UK Modification Number 16 at this time.

<u>Fitting Elevators & Rudder</u>

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams B3, A, B4, B5A & B, B6A & C

Items	Part Number	Qty
Rudder	232	1
Trim cables	226	1 set
Elevators	231	2
Elevator Bungee	Bag 233	
Elevator fork	218	1

a) Fit the rudder referring to B3 & B3A
b) Fit elevators to tailplanes, see B4, and install elevator fork 218. B5A & B.

Note: Incorporate UK Modification Number 2 at this time.

c) See diagram D4. Fit elevator compensator Bungee, around hinge tube at rear, back over the top of the saddle washers, tie knots in the ends of the Bungee and attach to elevator tube 207, with a jubilee/hose clip. (add tape or similar to the tube for protection). Adjust tension in the elastic, so that the elevator stays up, on it's own.

d) Refer to diagram B6A & B6C, Ignore B6B. Install trim cables.

Note: Incorporate UK Modifications Numbers 6, 7, 8, & 22 at this time.

e) Cable tie trim cables to elevator fork, but do not attach to trim tab for now.
f) Connect the rudder cables to the rudder and at the pedals
g) Examine the Steering link rods and Note that they are unequal in length the lengths of the tubes, they are 245 and 260mm.
h) Refer to diagram A9 and fit the Steering link rods as shown.
i) Adjust the steering links so that the bolts to which the cables are connected are in line on the pedals, the nosewheel is pointing streight ahead and the rudder must be aligned to the axis of the aircraft. If you push the aircraft along and note the line of travel you can test the nosewheel for its alignment.

Note: The tension of the rudder cables is set by how shorter or longer the two steering link rods are. The cables need to be taut but not tight, your inspector can check this.

Contact BMAA Inspector to perform Stage Inspection Number 2 and sign off.

Section 6
Pod, Windscreen & Instrument Panel

Fitting the Pod

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams C1 to C10

Items	Part Number	Qty
Pod	249	1
Windscreen,	253	2
Instrument Panel Top	255	1
Instrument Panel front,	256	1
Windscreen fixings,	257	
Medium Cable Ties.		

Notes.
It will be a lot easier if you have help to fit the Pod.
Take great care to position the Pod centrally before drilling holes. If this work is correctly performed, the final shape will be satisfactory. Constant checks will be required throughout the process to ensure that the Pod is centrally aligned.
Remember that the compression struts 214, are left and right handed

a) Position the airframe to rest the fuselage on its tail.
b) Insert supports under the main axle, at the strut attachments, so that the wheels are off the ground, with plastic drums as before when fitting undercarriage.
c) Remove the nose wheel assembly and the compression struts 214.
d) Remove nuts & washers from underneath the pod, which secure the rudder pedal assembly to the floor.
e) Remove the small bolt from the lug on the front fork support tube.
f) Lift Pod into position and temporarily support in place.
g) Manoeuvre Pod from underneath until the holes in the bottom of the Pod, line up with bolts from the rudder pedal assembly. Temporarily fit spare cable ties, through holes in rear of pod and around axle 211, to hold rear of pod up.
h) Check and ensure that centre hole in the Pod is aligned with nose wheel tube
i) Drill a hole in the Pod aligned with the lug on the front fork tube and fit the bolt. *It helps to shine a torch through the hole on the inside, then drill from underneath.*
j) See Drawing C10. Remove nuts from rudder assembly bolts, and add, from the inside, between the tube and the Pod, the thick nylon spacer washer to the bolt.
k) Fit the other (thinner) nylon washer to the underside of the Pod.
l) Repeat this operation to fit the other spacer washers & nuts.
m) Refit nosewheel assembly and tighten the 8mm bolt this time
n) Refit Compression struts 214 in their proper left and right hand locations.

Note. It is recommend to both fit a washer, (to take up the gap), between slots in end of the compression tubes and the plates. And to replace the clevis bolt, with a nut & bolt. (6mm dia x 30mm long shanked bolt, 8.8 spec).

Windscreen and Dash

See Diagram C4. Perform a trial fit of the two sections of the Instrument panel.

Note. It is suggested that, to facilitate possible maintenance access and removal of the instrument panel, 4mm captive anchor nuts be fitted.

Note: Incorporate UK Modifications Number 5 at this time.
The approved landing light modification can be done at this time.

a) When you are satisfied with the alignment, drill and fit the seven 4-mm bolts to join both pieces of the instrument panel together. Slide assembly into place. *Note this unit will determine the shape & rigidity of the Pod & windscreen.* Line up, and in the top instrument panel; drill the two furthest forward 4mm holes in the front corresponding to the two holes in the Pod. *Shown in C4 as bolts 1 & 2 not the centre one which is not shown.* Temporarily fit two 12 x 4mm bolts.
b) Proceed around the dash top alternating side to side as shown in C6 3 & 4.
c) When all the bolts are fitted to the dash top remove them again on one side only. Fit trim to pod edge on this side.
d) Add trim to the windscreen holes, which allow cabin tubes to pass through.
e) Temporarily detach the engine support tube at the engine mount, and pass through the hole in the windscreen.

Notes.
1. You may have to use an adhesive (UHU or similar) to secure the trim to the windscreen holes.
2. Before positioning the windscreen in place, if not previously fitted consider fitting Armaflex, (28 x 9mm) black foam pipe insulation to Roll bars 239 at this stage whilst the top fixing bolt can be temporarily removed to allow the foam pipe to be slid down the tube. This will enhance appearance and provide a better support between the windscreen & tubes. It is also required for the fitting of the optional door kit.

f) Insert the windscreen half between the Pod & dash top panel, temp fit a bolt to the lower front hole on the windscreen to the centre one on the Pod. See C9.
g) Temporarily fit cable ties to windscreen around cabin tubes to hold in place, making sure there is enough material to fit bolts along the side of the pod.
h) Starting from the centre, with a combination of lifting the pod in place and pushing the dash top forward and out, drill through the windscreen, lining up with the pre-drilled holes. Proceed to where you stopped earlier.
i) Remove bolts on other side and copy what was just done with the other half. Joining windscreen only at the moment with the bottom bolt hole and not up the centre of the screen. **Note: Windscreen halves overlap.**
j) When finished fit remaining bolts that join the pod to the windscreen on both sides.
k) Join windscreen halves together up the middle.
l) Finally fix all the remaining plastic ties, to cabin tubes, and particularly those on the level of the engine support tubes, which prevent windscreen collapsing under pressure from wind of the propeller. See C9A
m) The Dash front can now be removed again for the fitting of the instruments and wiring.

Incorporate UK Modification Number 12 at this time.

Notes.

1. Refer to HADS No. HM5; paragraph 8 for the minimum required instrument fit. It is suggested that if all the aircraft instruments are available they be fitted now. Plan the layout of the instruments carefully, taking into consideration future requirements of possible Radio and GPS fit. Refer to the relevant BMAA TIL 027 for guidance on how to fit instruments.
2. It is a recommendation from one of the BMAA test pilots that engine switches are fitted to the central panel, in line with TIL 027 don't fit too close to the compass.
3. The Instrument front panel will have to be removed for this work.
4. The Wiring loom components may also be fitted at this time. (See wiring diagram.)
5. You can also fit the Pitot & Static tubes at this time.
6. Holesaws can be used for drilling out the hole shapes for the various instrument gauges. The sizes required are: 42, 52, 57 and 78mm.

Additional Note: It is VERY important that all cables and tubing are properly secured behind the dashboard. This is especially important where they are near the rudder and brake pedals, so that they don't get caught on the pilot's feet.

Section 7
Rear Framework & Fuselage Cover

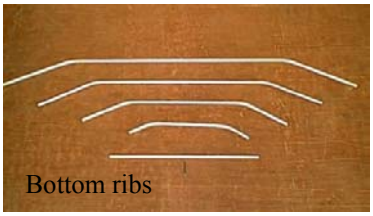
Rear Framework

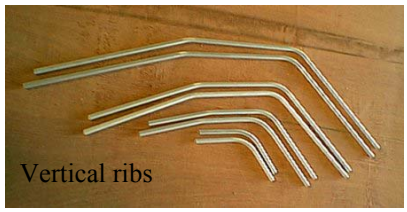
Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams D1 to D3A

Items	Part Number	Qty
Fuselage Ribs,	223	
Pop Rivets	4mm	
Framework fittings	223	

Note. The Rear Fuselage framework is to give the fuselage its shape. Although care should be taken, perfect alignment is not critical. Some slight changes have been made to the UK prototype and are shown in the photographs below. It is suggested to follow these where possible rather than the assembly drawings. This section will require a lot of pop riveting.

a) First lay out all the ribs marked as 223065C in drawing D1.


Bottom ribs


Vertical ribs

b) Starting with the vertical ribs pop rivet the ribs to the pre fitted brackets on the keel and tail support tubes 241 as shown in D1A & D1B. **Note** the furthest forward rib (longest) is fitted with a tip and bolted into place at plate 102130.

c) Fit the bottom ribs as above.

d) Lay out the long side ribs marked as 223065B & 223065S in drawing D2.

e) Referring to D2 trial fit the two-streight side ribs (223065S) into position, the longer of the two fits between point "C" and point "F" and the shorter from point "B" and the middle of the last vertical rib. See picture "A" below.
Note. Side ribs are on the outside of the vertical ribs.

f) Mark the position of the brackets that are to be fixed onto rear cabin tube 240 as shown in D2B & D2C. Pop rivet the brackets in place on tube 240.

g) Remove the brackets fitted to the rear of 241 and then make up a new one like shown in picture "B" below. (A mirror double of the original). Out of a piece of 1mm aluminium 6063 or 6082 sheet stock.

h) Rivet long streight top tube in place, between the top bracket D2C and the top of the new bracket fitted at D2F. It may need cut if too long.

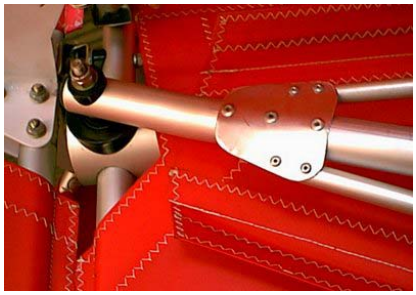
i) Cut a square piece of aluminium sheet approx 50 x 50mm and rivet in place in middle of vertical rib shown in picture "A" below.

j) Rivet second streight rib between D2B and this plate, cutting of excess to suit.

k) Fit a tip No. 2 (drawing D2A) into the two long curved ribs, and trial fit into the slot on the rear lip of the pod. Rivet in place.

l) Relocate the tip/rib into the pod, and rivet to the bottom of the bracket shown below in picture "B" Cut off excess tube.

Pic A



Pic B

m) Fit remaining lower curved rib, locating the end on the piece at the axle see pic "C" below. Pop Rivet in place.

n) Cut from your aluminium sheet approximately 26 off 50 x 50mm square or round pieces. These are then fitted like shown in D2D to all places where the ribs cross. This holds the ribs all firmly in place. Drill a 3mm holes and fit a 3mm pop rivets. Ignore D2E and replace as above. see pic "D"

o) Fit short cross tube referring to D3 and D3A

Pic C

Pic D

It is advisable that Mod 23 Battery Carrier is installed at this time before the cover is fitted. See Mod manual for details as a certain amount of wiring is required.

Rear Fuselage Covering

Preparation. Identify the following items and remove the packaging. Carefully examine.

Items	**Part Number**	**Qty**
Fuselage sailcloth	236	1
String		

a) Verify that control cables are correct; rudder cables go either side of control tube 207 then cross before going over pulleys on top. Check that the trim cables are ok. Check fuel tanks and the fuel lines to ensure that there are no leaks.

b) Cable tie Aileron cables to side ribs to give a smooth curve in cable.

c) Wrap fuselage covering around framework, and starting at rear overlap Velcro strip on top, not forgetting to hook slots over the elevator fork.

d) Stretch the fabric forward by wrapping it around tube 240 with one hand, and hold in place with cable ties.
e) Attach lacing string to the top of one side and lace the string through all the eyelets to the bottom.
f) Repeat this for the other side, also to the bottom of the fabric, through the holes in the Pod.
g) Pull and tension the string on each side and bottom in rotation until you are satisfied with the fit and location of the fabric on the tube. Tie and secure all the strings. Ignore eyelets in cover at tail, and Velcro in place only.
h) Carefully examine and ensure that all other components inside the fuselage frame are fitted and secure as required.
i) Fit fabric cover/baggage compartment behind the seats, the flap fork will need to be temporarily removed. Fit small fabric side pieces.
j) Attach trim cables to trim tab and secure along fork with cable ties. Ensure trim lever is working in the correct way, which is - trim tab deflected down when trim lever is pulled back.

Note:
If fitting optional door kit, this is best done now.
Referring to the instructions supplied with the relevant Door Kit.

Section 8
Assembling the wings

Assembling the wings

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams E1 to E6

Items	Part Number	Qty
Sailcloth for Wing left/right	236	2
Wing tip tubes left/right	237	2
Wing spar tube leading edge left/right	203	2
Wing spar tube trailing edge left/right	204	2
Aileron Cables	234	4
Wing Compression strut	203003	2
Wing Compression strut with pulleys	203002	2

Prepare a clean surface and place the wing sleeve flat onto it with the lower surface uppermost. To avoid marking or damaging the wing fabric during this assembly, take great care that the surface is kept clean. Do not step onto, or walk on, the wing material. **N.B.** Wing spars are left and right.

Note. You are about to insert the foam stiffener material into the leading edge pocket. The foam is narrower at one end, this goes to the tip. Insert your arm into the pocket at the wing tip end. Progressively push your arm into the pocket, pulling the sailcloth up your arm, do this until your fingers can touch and pull the foam material out to the wing tip. (it might be helpful if somebody else could feed it in from the other end).
Be careful. It is possible to rip the foam. Ensure, by feeling all along the leading edge, that the foam is correctly and evenly positioned with no folds or tucks. Diagram E1

a) See diagram E2. Align and assemble the two parts of the trailing edge, fit a 4mm pop rivet into the hole adjacent to the join, and unroll the cable. Temporarily remove the small triangular plate from the outer end of the trailing edge to enable the trailing edge to be inserted into the wing pocket.

b) Align and assemble the two parts of the leading edge, fit a 4mm pop rivet into the hole adjacent to the join, and unroll the cable.

c) Referring to diagram E2A, E2B, E4C & E4D Install the compression tubes between the leading edge & Trailing edge tubes.
One of the compression tubes has a set of pulleys for the Aileron cables, this tube is installed with the pulleys closest to the Leading edge, and nearest the tip.
See diagram E4.

Note: pulley mounting shown on E2B has now been changed to a pulley on both sides of the tube, with an extra cable guide. See photo below

Refer to UK Modification Number 14 for full details of this.

d) See diagram E3 Insert wing tip tube between L/E & T/E.

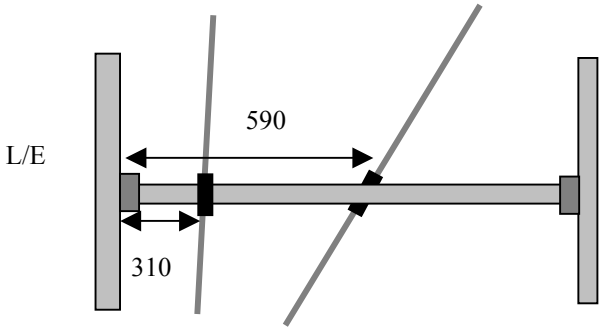
e) See diagrams E4A & E4B connect bracing cables at wing root, (note cables pass below the compression tube).

f) Lay out the Aileron Cables and identify each one referring to diagrams E5, F2E & F2F.

g) A pulley is located each side of the compression tube and not as shown in diagram E5B. (see photo) One of the cables (noted as 234219 in E5) is the aileron return cable, which connects to the bottom aileron horn, and so is located around the bottom pulley. This cable then connects to the other similar cable in the opposite wing with a turnbuckle approx. below the keel tube.

h) The cable has a piece of tubing located on it that attaches to the compression tube as shown in E5A with two cable ties, position this tube 310mm from inside the leading edge. (On bottom side of wing compression tube).

i) The other cable (noted as 234218 in E5) is the cable, which connects to the aileron cable coming from the stick. This connects to the top aileron horn. Similarly attach the piece of tube 590mm from inside the leading edge to the topside of the wing compression tube.



Wing shown from below

j) Check all nuts and bolts and clarify the cables locations above.

k) Place the wing skin on a flat surface with the bottom side up and slide the complete wing assembly into the wing.

Note the aileron cables will have to be fed out through the holes in the fabric, make sure that they don't get crossed inside the wing. (You can use a wing rib to fish them out, attaching the string on the end of the rib to the shackle on the end of the cable.

l) Repeat this procedure, paragraphs (a) to (l), to assemble the other wing.

Section 9
Attaching the Wings to the Aircraft

Attaching the Wings to the Aircraft.

Preparation. Identify the following items and remove the packaging. Carefully examine. Refer to diagrams E6 to E9

Items	Part Number	Qty
Wing lift strut assembly with fasteners front	205	2
Wing lift strut assembly with fasteners rear	206	2
Jury struts	215	2
Jury struts	216	2
Link struts	?	2
Wing Straps	233	8
Wing Battens	220	

Note. You will need assistance with this task

a) See diagram E6A. Attach the lift struts to the airframe at the axle; make sure they are fitted the correct way (link strut brackets, facing towards each other).
b) Position the first wing near to its position on the airframe
c) See diagram E6C Insert the leading edge tube between the brackets and attach insert the clevis bolt & ring
d) See diagram E6B Fit trailing edge into position and clevis bolt & ring.
e) See diagram E6D & E6E Attach front & rear lift struts to the leading and trailing edge brackets.
f) Repeat the work of paragraph (a) to (e) for the other wing.
g) See diagram E7. Install the jury/link struts.

Note: Incorporate UK Modification Number 13 at this time.

h) See diagram E8A. Insert the 4 larger streight battens into the root of the wing.
i) Lay out the wing battens, noting numbers, check the contour of each batton, against the Batton Profile contained in the Operators manual.
j) Starting inboard from the wing root; progressively insert the upper battens then the lower ones, in each wing. E8
k) See diagram E8A. Tension the wing panels by pulling them together using webbing straps 233 (spend time working out how the straps loop around rings so that you can pull the panels together). Proceed gradually, tensioning each strap in several stages. Five straps join the upper battens, and three join the lower ones.

Note. Do not over tighten the straps as you can tear the fabric. The wing tensioning process can be redone after the first few flights. This should then have the wing at its correct operating tension.

Assembling the Ailerons & Flaps to the wings

Preparation. Identify the following items and remove the packaging. Carefully examine the Aileron & Flap assemblies. Refer to diagrams F1A to F2D

Items	Part Number	Qty
Flap assembly	261	2
Aileron assembly with fasteners left and right	222	2

a) Fit the Flap into position referring to drawings F1, F1A & F1B.
b) Offer the Aileron into position, noting that one end locates into the flap, attach at tip, but do not over tighten the bolt, as this is a hinge. F2, F2A, F2C & F2D

Note: Incorporate UK Modification Number 17 at this time.

c) Attach the aileron cables to the bottom and top aileron horns. F2B
d) Attach the Flap forks to the Flap horn inside the fuselage.
e) Repeat stages (a) to (d) for the other wing.
f) Connect top aileron cables to cables from sticks at position (E) as shown in F2 above the seats.
g) Join together bottom aileron cables at position (F) as shown in F2 .

h) See diagram E9. Fit top and bottom fabric pieces to close the gaps between the wing panels. Some trimming to the top panel will be required, to allow for the exhaust bracket.
i) Add the pitot/static head to the front lift strut and connect the pipes to the ones coming from the dashboard.

Note. Do not wirelock the turnbuckles at this stage. Refer to section 11 for fine tuning & setting of all of the controls.

Warning. The nylon bushes holding the ailerons must **not** be lubricated with oil or grease only use a silicon or nylon lubricant.

Contact BMAA Inspector to perform Stage Inspection Number 3a and sign off

Section 10
Installing the Engine,

Install the engine referring to the manufactures installation guidelines.

UK Modifications numbers 10, 15, 19, are applicable if fitting the Rotax 912 engine.

Installation Details of engine mount fitting for Rotax 912 or Jabiru 2200 are available from Wessex LAC or Xair Ireland.

Fuel system diagrams are contained in the Falcon Modifications Booklet.

Note: An engine installation checklist will have to be completed this should come with your build paperwork from the BMAA.

Contact BMAA Inspector to perform Stage Inspection Number 3b and sign off

Section 11
Fine Tuning of the Controls and Control Surfaces

Control Surface Deflections
Shall be set to the limits and settings given in the HADS No. HM5 current and latest issue.

Placards.
Placards shall be fitted and contain the information in the HADS No. HM5 latest issue.

Elevators & Pitch Controls
Ensure that the pivot bolts are not too tight against the washers. The elevator control should operate smoothly through the whole range of movement. Check sufficient movement is present according to the HADS, if not change the position of the forward bolt on part 217 where it attaches to the control column.

Elevator Bungee
This shock cord is to compensate for the weight of the elevator. Check that it is tensioned just enough so that the stick does not fall forward or that the elevator, does not drop when released.

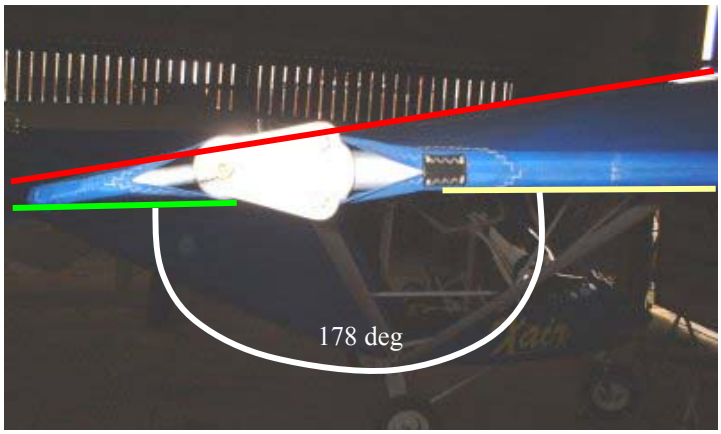
Elevator trim tab.
Check and ensure that it moves in the right direction. Push the trim lever forward, the tab should move up. Adjust the cables so that the trim tab is in line with the elevator when the lever is vertical. The trim cables must be tight, but not excessively so. Do not apply any lubricant to the pulley wheel. You may also need to tighten the screw to prevent slipping.

Ailerons
The correct setting of the ailerons is measured at the wing tip.
The lower surface at the tip is 2 deg down from that of the lower surface of the wings tip tube. See picture.

The red line shows that the Aileron approx follows the Profile of the wing upper surface.

The green line is the aileron Lower surface and the yellow Line is the lower surface of the wing tip tube.

A measuring protractor can be easily made from a piece of ply or lexan.



Set both aileron turnbuckles so that the stick is in the middle. Then adjust the aileron return cable turnbuckle so that the cables are taut, but not so tight as the stick is too stiff to move.
On completion, safety wirelock the turnbuckles.

Flaps
Adjust the flaps so that they are both in line with the ailerons when viewed from behind.

The Rudder.
First check that the rudder cables are crossed. The cables will under slight tension when the rudder is centred: slack in all other positions is normal. When the pedals are lined up, the rudder should be in line with the longitudinal axis of the aircraft; the easiest way to get this is to clamp the rudder between two cleats and set the adjustable links so that:

- The nose wheel is in line with the longitudinal axis
- The pedals are lined up
- The cables are slightly taut

Pulleys.
Check the fitting and operation of the pulleys. The pulleys at the aft end of the fuselage Keel must be installed so that they cannot move off their bearing. The red mark must be visible for the outside. Only in this way will the bearing keep the pulley in place.

Lubrication.
The ideal lubricant is a silicone or nylon spray. (do not use WD-40, as it will stain the sailcloth if any comes in contact with it) Apply to all points likely to create unwanted friction: control tubes washers and pivots, elevator and rudder hinges, aileron and pedal bearing, all pivot bolts of sticks as well as the fork main axle.

In summary, to obtain smooth, precise controls, you need: barely taut cables, barely tight bolts and regular lubrication

Pre-flight checks:
When you have completed the above checks, sit in the cockpit and ensure that the control-to-control surfaces system works perfectly, and give the right responses. This is vital common sense.
Carry out a complete and detailed pre-flight check, as detailed in the Xair Falcon flight manual.

Ensure that all control surface deflections are set in accordance with HADS No. HM5

NOTE: Please make sure that you have the UK approved Operators Manual and aircraft log books made up before contacting your inspector for the final inspection.

Contact BMAA Inspector to perform Stage Inspection Numbers 4 and 5 and sign off

Annex A

Xair parts listing sorted alphabetically by item name,

Item Name	Part No	Quantity
Aileron Assembly	222	2
Back Seat Tube Assembly	212	1
Battens Set	220	30
Brake Cable Assembly	228	1
Build Manual Text		1
Build Manual Illustrated		1
Cables Set Check sheet in picture manual	234	1
Compression Legs Assembly	214	1
Control Stick Assembly	259	1
Covers Wing, Fin & Fuselage	236	1
Dash Board Front	256	1
Dash Board Top	255	1
Electrical Wiring Set Consists of:-	225	1
Main Loom		
Dash Board Loom		
Engine End Loom		
Amp Meter		
Elevator Assembly	231	2
Elevator Control Tube Assembly	207	1
Elevator Fork Tube assembly	218	1
Elevator Tube Front Part Assembly	217	1
Engine Support Tube	238	2
Fasteners package (4mm bolts & nuts)	257	50
Fin Lower Leading Edge	245	1
Fin Top Leading Edge	244	1
Fin Trailing Edge Assembly	219	1
Flap Assembly	261	1
Flap Fork Assembly	262	1
Floor assembly	250	1

Floor Tube	242	2
Fork mobile part (Fork Steering	209	1
Front Fork assembly	210	1
Front Wheel Assembly	229	1
Fuel Tank Assembly	224	2
Fuselage Fittings	223	10
Hoses Set	235	1
Horizontal Jury Strut	?	2
Jury Strut Assembly Long	215	1
Jury Strut Assembly short	216	1
Keel Front part Assembly	201	1
Keel Rear part Assembly	202	1
Leading Edge Assembly Wing	203	2
Leading Edge Foam	254	2
Main Axle Assembly	211	1
Nose wheel Tube assembly	208	1
Operators Manual		1
Pod	249	1
Pod Lettering		2
Pop Rivets Set & cable ties	247	80 + 30
Rear Wheel Assembly	230	2
Roll Bar Front	239	2
Roll Bar Rear	240	2
Rudder Assembly	232	1
Rudder Pedals LHS & RHS	258	2
Rudder Tab	246	1
Seat assembly	251	2
Shock Absorbers Rear	248	2
Stabiliser assembly	252	2
Tension Legs Assembly	213	1
Throttle & Choke Assembly	227	1
Throttle Levers	260	1
Tip Tube	237	2
Trailing Edge Assembly Wing	204	2

Trim Cable Set Consists of:-	226	1
Inner 1.25mm dia x 10M long		
Front Cable outer 55cm long 2 of		
Rear Cable outer 158cm long 2 of		
Tail Supporting Tube	241	2
Under Seat Tube	243	1
UK Modifications Kit & Manual		1
Webbings – wing straps, tank straps	233	7 + 4
Windscreen halves	254	2
Wing Strut Assembly Front	205	2
Wing Strut Assembly Rear	206	2

Annex B

Xair parts listing sorted Numerically by item part number

Part No	Item Name	Quantity
201	Keel Front part Assembly	1
202	Keel Rear part Assembly	1
203	Leading Edge Assembly Wing	2
204	Trailing Edge Assembly Wing	2
205	Wing Strut Assembly Front	2
206	Wing Strut Assembly Rear	2
207	Elevator Control Tube Assembly	1
208	Nose wheel Tube assembly	1
209	Fork Steering Bellcrank	1
210	Front Fork assembly	1
211	Main Axle Assembly	1
212	Back Seat Tube Assembly	1
213	Tension Legs Assembly	1
214	Compression Legs Assembly	1
215	Jury Strut Assembly Long	1
216	Jury Strut Assembly short	1
217	Elevator Tube Front Part Assembly	1
218	Elevator Fork Tube assembly	1
219	Fin Trailing Edge Assembly	1
220	Battens Set	1
222	Aileron Assembly	2
223	Fuselage Fittings Set	1
224	Fuel Tank Assembly	2
225	Electrical Wiring Set Consisting of:- Main Loom Dash Board Loom Engine End Loom Amp Meter	1

226	Trim Cable Set Consisting of:- Inner 1.25mm dia x 10M long Front Cable outer 55cm long 2 of Rear Cable outer 158cm long 2 of	1
227	Throttle & Choke Assembly	1
228	Brake Cable Assembly	1
229	Front Wheel Assembly	1
230	Rear Wheel Assembly	2
231	Elevator Assembly	2
232	Rudder Assembly	1
233	Webbings – wing straps, tank straps	7 + 4
234	Cables Set	1
235	Hoses Set	1
236	Covers Wing, Fin & Fuselage	1
237	Tip Tube	2
238	Engine Support Tube	2
239	Roll Bar Front	2
240	Roll Bar Rear	2
241	Tail Supporting Tube	2
242	Floor Tube	2
243	Under Seat Tube	1
244	Fin Top Leading Edge	1
245	Fin Lower Leading Edge	1
246	Rudder Tab	1
247	Pop Rivets Set & cable ties	80 + 30
248	Shock Absorbers Rear	2
249	Pod	1
250	Wooden Floor assembly	1
251	Seat assembly	2
252	Stabiliser assembly	2
254	Windscreen	2
254	Leading Edge Foam	2
255	Dash Board Top	1
256	Dash Board Front	1

257	Fasteners package	1
258	Rudder Pedals LHS & RHS	2
259	Control Stick Assembly	1
260	Throttle Assembly	1
261	Flap Assembly	1
262	Flap Fork Assembly	1
?	Horizontal Jury strut	2
	Operators Manual	1
	UK Build Manual Text	1
	Build Manual Illustrated (Picture Manual)	1
	Pod Lettering	2
	UK Modification Kit & Manual	1

Approved components to comply with the weight restrictions if fitting of a Rotax 912 may be obtained from, Wessex Light Aircraft Co Ltd.