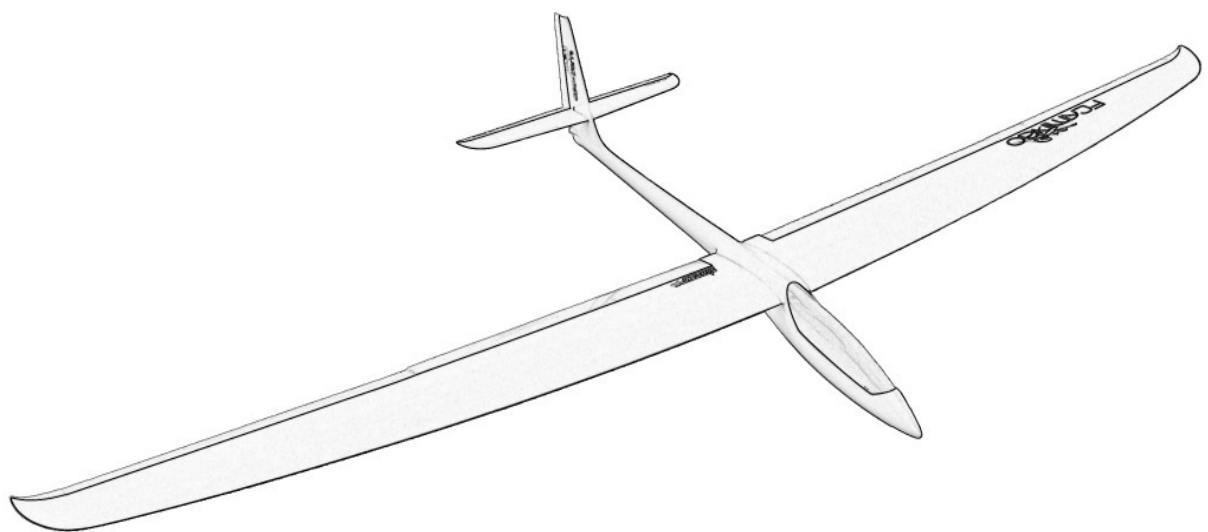


 **Lamingo** 2006

 **Lamingo** 2006  
ELECTRO



## Contents:

<b>Flamingo / Flamingo Elektro 2006 Glider/Electric Glider. ....</b>	<b>3</b>
<b>Preface.....</b>	<b>3</b>
<b>Kit Contents.....</b>	<b>4</b>
<b>Technical Data.....</b>	<b>4</b>
<b>RC functions.....</b>	<b>4</b>
<b>Assembling your FLAMINGO 2006.....</b>	<b>5</b>
<b>The Fuselage. ....</b>	<b>5</b>
<b>Fuselage Openings / Wing faring.....</b>	<b>5</b>
<b>Installing the winch hook (*).....</b>	<b>5</b>
<b>Installing the optional aero-tow release (*) .....</b>	<b>6</b>
<b>Completing the canopy.....</b>	<b>6</b>
<b>Installing the canopy catch. ....</b>	<b>6</b>
<b>Installation of the all-flying tail plane. ....</b>	<b>7</b>
<b>Completing the tail-plane halves. ....</b>	<b>7</b>
<b>Vertical stabiliser and rudder.....</b>	<b>8</b>
<b>Rudder control horn.....</b>	<b>8</b>
<b>Installing the servo mounting frame (*).....</b>	<b>8</b>
<b>Completing the fuselage control linkages. ....</b>	<b>9</b>
<b>Electric Motor Installation (*).....</b>	<b>10</b>
<b>The Wings .....</b>	<b>10</b>
<b>Installation of the wing servos.....</b>	<b>11</b>
<b>Installation of the wing control horns. ....</b>	<b>12</b>
<b>Wing servos wiring. ....</b>	<b>12</b>
<b>Finishing.....</b>	<b>13</b>
<b>Radio Control Equipment Installation.....</b>	<b>13</b>
<b>Balancing &amp; Adjusting.....</b>	<b>14</b>
<b>Recommended control throws.....</b>	<b>15</b>
<b>First Flights. ....</b>	<b>16</b>
<b>Safety.....</b>	<b>17</b>
<b>Parts List. ....</b>	<b>18</b>

## **FLAMINGO / FLAMINGO Elektro 2006 Glider/Electric Glider.**

Flamingo 2006 ARC	# 41500
Flamingo 2006 ARF	# 41510
Flamingo 2006 Design	# 41515
Flamingo 2006 E – ARC	# 41520
Flamingo 2006 E – ARF	# 41530
Flamingo 2006 E – Design	# 41535

### **Preface.**

Thank you for choosing to the FLAMINGO / FLAMINGO Elektro 2006 high performance glider / electric glider. We wish you much success and enjoyment with your new model.

Your TANGENT model kit from the home of GRAUPNER represents a mature design and the product of many years experience in the manufacturing of high performance model aircraft. However, despite the most scrupulous quality control, small deviations may arise. We ask therefore that all parts be carefully inspected prior to undertaking any assembly work and before flying the model. This is particularly important as any used parts are not subject to repair or replacement. Notwithstanding the above, we are happy to repair or replace parts found to be faulty – subject to approval by the factory. Please therefore return any faulty parts together with a detailed description of the fault.

Our products are the subject of continuous development and as such we reserve the right to make changes to the design, engineering, manufacture and materials supplied without prior notice. As the product is supplied in kit form, no claims will be considered in respect of the assembly or operation of the model.

### **Caution!**

**Remote controlled models and model aircraft in particular, are not toys in the normal sense. Building and operation of this model aircraft requires a high degree of technical understanding and care, as well as considerable skill and discipline at the flying field. Errors in the building process and in the operation of this product can result in serious personal injury and damage to property. As kit manufacturer we have no control over the assembly, maintenance and operation of this model aircraft, we therefore take this opportunity to stress the potential hazards and emphasise the personal responsibility on the part of the user.**

## Kit Contents.

(See Detailed Parts List)

- 1 **Pair ARC Wings - incorporating LSCTP-Technology** with elliptical tips, INTRO-Technik, torsion-rigid and fully integrated Ailerons and Flaps incorporating Elastik Flap Technology. TA-Servolocks and steel wing-joiner.
- 1 **Fuselage** – in brilliant white, with Multilock-Wing locks (for assembly without tools!). CFK reinforced fuselage boom, with integrated Bowden cables.
- 1 **CFK- Canopy**
- 1 **Pair Tail-plane** with integrated joiner system, finished leading and trailing edges.
- 1 **Ruder** in preformed Balsa
- 1 Set pre-formed wooden parts.
- 1 Quality hardware accessory pack.
- 1 Set wire parts.
- 1 Set Building Instructions.

## Technical Data.

Wingspan (mm) .....	2850
Fuselage length (mm) .....	1330
Wing area (FAI) in dm <sup>2</sup> .....	27
Weight (gm). .....	from 2650
Wing loading (g/qdm) .....	from 48
Aerofoil .....	HQW 2,5/10
Horizontal dihedral (deg) .....	1
Centre of Gravity (mm - from root leading edge) .....	92

## RC functions.

Ailerons	2 C 351 (Grp # 5123)
Flaps	2 C 351 (Grp # 5123)
Rudder	1 C 4041 (Grp # 3916)
Elevator	1 C 4041 (Grp # 3916)
Aero tow release	1 C 351 (Grp # 5123)

It is important that the **Receiver Battery** be selected to match the intended use. The capacity ought to be sufficiently generous to cope with the on board radio control system (it's always more useful to have more battery capacity than lead nose-weight!). Considering the use of up to 7 servos, we recommend a battery pack of at least 1700 mAh capacity (C ) and of good quality and always well maintained.

If the model is to be equipped as an electric glider with a Battery Eliminator Circuit (BEC) system, then please ensure that the BEC has sufficient capacity to cope with the current demand of the servos installed, better still, fit a speed controller without an on-board BEC and use a separate battery to power the receiver.

In the case of the powered glider we recommend the following a tried and tested drive configuration:

Motor:	Compact 460Z 11,1 V (Grp # 7748)
Spinner:	Precision Spinner (Grp # 6040.4)
Propeller:	Folding C.F.P. (Grp # 1336.33.18)
Speed Controller:	60A Brushless C (Grp # 7236)
Battery:	LiPo 3 / 2600 (Grp # 7652.3G2)

### **Important Note regarding Styrofoam wing cores.**

**For all joints involving Styrofoam wing cores it is essential that you do not use any solvent based adhesives, and in particular avoid use of any form of cyanoacrylate glue. Use of such adhesives will destroy the foam and render the affected parts useless. Use only solvent-free adhesives, such as Epoxy resin and/or Aliphatic Resin (white wood glue) if working anywhere near exposed areas of Styrofoam.**

### **Notes regarding the use of Epoxy Resin.**

Epoxy alone is not a viable adhesive! However, the addition of appropriate additives makes for a variety of excellent adhesives. Match the choice of additive to the job at hand:

1. Chopped cotton fibres – produces a tough but flexible joint.
2. Superfine glass fibres - makes a hard joint.
3. Microballoons – produces a highly effective, lightweight filler.

### **Assembling your FLAMINGO 2006.**

The kit you have purchased includes all the parts required to complete the basic airframe (ARC) and covering (ARF), but does not include adhesives or radio control components. You can make a significant contribution towards the ultimate appearance and performance of your model by building carefully and accurately. It is a well known fact that a poorly built model does not fly well and may be difficult to control. A well built and properly trimmed model will reward the pilot and spectators with good performance and accurate handling characteristics. Be patient, take your time; the effort will be well worth while!

**Note:** For those customers intending to install an electric drive system, please pay particular attention to the parts of the instructions indicated with an asterisk (\*).

### **The Fuselage.**

Begin the construction with the Fuselage as this is the point of reference for all other parts.

### **Fuselage Openings / Wing faring.**

Open out all of the fuselage openings at the points indicated in the mould. Carefully drill the 3mm dia. holes at the four pilot positions to accommodate the wing incidence pins. Use the same drill to make a series of small adjacent holes to open out the wing-joiner position and the holes for the wing servo connections in the wing faring.

Tip. Use a needle file or suitable rotary tool to finish the job.

### **Installing the winch hook (\*)**

(Pure glider version - not applicable for the eclectic version)

Using a flexible tape-measure, measure and mark a point 455 mm from the nose along the underside of the fuselage. Drill a 2.5mm hole to accommodate the winch hook. Cover the hole on the outside with tape to protect the surface and roughen up

the inside of the fuselage in the area of the hole. Now glue the tow hook support block into place centrally over the hole using thickened epoxy.

**Tip.** Use a self tapping screw, through the hole in the bottom of the fuselage to secure the support block while the epoxy cures.

### **Installing the optional aero-tow release (\*)**

This is also a good time to install the aero-tow release (if required). There are a selection of purpose made aero tow release mechanisms available commercially for which installation techniques vary, but the simplest form is described below:

Carefully mark out and cut a 10mm slot about 2mm wide transversally about 5cm from the nose and with the lower third of the fuselage diameter. Using thickened epoxy, fix a length of PVC Bowden cable outer along the inside of the fuselage such that it intersects the slot at 90 degrees. The slot should be positioned so as to allow at least 5-10mm of the PVC tube in front of the slot.

#### ***Fig 1. Aero-tow Release***

Once the resin has cured, cut away the Bowden cable outer from inside the slot and insert a length of 0.8mm steel wire inside the PVC tube such that it engages both sides of the slot when closed and is clear of the slot when open. Connect the free end of the steel wire to a suitable servo to operate the aero-tow release. You will require a simple loop, best made from monofilament nylon to link up to the towline.

### **Completing the canopy.**

The Carbon canopy is supplied ready made, requiring only minimal finishing. Place the canopy on the fuselage opening, carefully check the joint and adjust as necessary for a perfect fit. Minimum gap and good overall appearance will be your just reward for a little extra time and effort at this stage.

### **Installing the canopy catch.**

The forward canopy pin is held in place by the channelled hardwood support. The support is glued to the inside of the canopy at a position about 15mm inboard of the forward canopy opening in the fuselage, using thickened epoxy. Be sure to roughen the inside of the canopy with abrasive paper before gluing to ensure a good bond. The canopy pin is likewise glued into the channel in the hardwood support – such that the pin protrudes about 15mm from the front of the support to engage with the rim of the fuselage opening. Once cured, test fit the canopy, and use a 3mm drill or suitable round file to form a recess in the forward rim of the fuselage opening to accommodate the canopy pin. Re-check and trim carefully until a perfect fit is achieved.

The rearward canopy fixing is made using the GRP leaf-spring which is bonded to the inside of the canopy and held in place with a small piece of fibreglass cloth and some epoxy. Again, be sure to roughen up the inside of the canopy with abrasive paper before bonding the leaf-spring in place.

#### **Fig 2. Canopy Catch**

## Installation of the all-flying tail plane.

The elevator bell-crank is factory installed in the **FLAMINGO and FLAMINGO Elektro**. This system has proved entirely effective in many of our models over a long period of time and ensures a secure connection with no unwanted slop in the control.

Proceed as follows:

- Open the holes in the fin using a twist drill.
- Prepare the steel wires for the elevator joiner. These should be cut to length (if necessary) and rounded off at the ends.
- Prepare a means to hold the fuselage with the fin at right angles to the work surface. Also prepare something on which to support the two tail-plane halves at right-angles to the fin and at the correct height. (A few carefully selected books might well serve as an adequate jig for this purpose!)

Attach the all-flying tail-plane making sure that the rearward steel wire joiner passes through the hole in the bell-crank installed the fin. Carefully check the alignment of the tail-plane halves with the fin. Now loosen the two Aluminium nuts holding the bell-crank bearing in place and make any adjustment necessary to ensure that that tail-plane halves can be aligned at exactly 90° to the fin. Apply a little thickened epoxy to the inside of the two nuts and carefully tighten, constantly checking that correct alignment between tail-plane and fin is maintained at all times.

Leave the entire tail-plane assembled in the jig described above until the adhesive has fully cured.

### ***Fig 3. Alignment of the all-flying tail plane***

**Tip:** While working with adhesives in this area apply thin parcel tape over the sides of the fin in the area of the bearing and cut through the tape to expose the holes. This will ensure that any excess adhesive does not spoil the finish on the fuselage.

## Completing the tail-plane halves.

Work on the uncovered tail-plane panels is limited to finishing the root outline to match the profile of the fin. The tail-plane halves are factory finished, but some may wish to achieve an even more accurate match by carefully working the root area using a fine grade abrasive paper.

**Note:** The joiner tubes installed in the tail-plane halves incorporate the integrated All Moving Tail-Lock mechanism.

**Before fitting the joiners into the brass tubes for the first time, check that the wire joiners are perfectly straight and burr free. When pressing the tail-plane halves into place, you will feel a mild mechanical resistance which is sufficient to hold the tail-plane halves securely in-place during flight.**

## **Vertical stabiliser and rudder.**

The rudder supplied in the kit is complete and requires only minimal finishing. The hinge is made by a steel wire running in a factory installed pivot tube installed in the leading edge of the rudder.

Open-up the rudder push-rod shroud at the rear of the fuselage using an 8-10mm dia. round file or similar rotary tool.

Using a small round file; form a small semi-circular recess at the top of the fin post to accommodate the leading edge of the rudder.

**Note:** Customers building the ARC version may wish to take this opportunity to adjust the profile of the leading edge of the rudder to match the trailing edge of the fin.

Transfer the position of the two hinge positions in the leading edge of the rudder onto the trailing edge of the fin post and drill a 3.5mm hole at each point to accommodate the hinge bolts (eye-bolts) and trial fit with the hinge bolts positioned in the rudder pivot tube. Work carefully to determine the right depth of the hinge bolts so as to ensure equal and adequate rudder throws. Once satisfied with the positioning, bond the hinge bolts into place in the fin post using thickened epoxy.

**Tip:** It is possible to unscrew the hinge bolt and reset it with a little more adhesive should you find it necessary to make an adjustment after the hinge bolts have been set into the fin post.

The rudder is attached by pressing the steel wire down through the pivot tube from the top, and engaging both hinge points.

### ***Fig 4. Rudder Hinge***

## **Rudder control horn.**

Drill a 4mm hole in the base of the rudder to accommodate the eye-bolt which forms the rudder control horn. The hole to be made such that the hole in the eye bolt is positioned centrally within the rudder push-rod shroud and at 90° to the rudder itself. Drill carefully, without piercing the outer skin of the rudder.

Once satisfied, bond the eye-bolt securely into the rudder using thickened epoxy leaving a small bead of thickened epoxy around the base of the eye-bolt.

**Note:** Customers building the ARC version may wish to cover the rudder before gluing the eye-bolt in place.

Customers building the ARF version will need to carefully remove a little of the covering material around the fixing point.

## **Installing the servo mounting frame (\*)**

The wooden parts for both pure glider and the electric version are supplied in the kit – please select only those parts required.

**Note:** The servo mounting frame does fit in the fuselage opening! Turn it around carefully and you will find that it will slip neatly into place. Don't be tempted to sand away too much material which will result in a poor fit.

From the wooden parts kit, select the semi-circular fuselage support frame and the servo mounting frame. Position these parts such that the fuselage support frame fits snugly in the rear of the cockpit opening and align the servo mounting frame to suit. Make sure that there is sufficient space in front of the servo mounting frame to accommodate your chosen battery pack. Mark the position carefully with a pencil. Now remove the two protective strips from the inside of the fuselage opening and tack the support frame and servo frame in place using an instant adhesive – before bonding the entire structure into the fuselage with a generous bead of thickened epoxy.

Test fit and install the rudder and elevator servos according to the instructions supplied with the servos.

### ***Fig 5 & 6. RC Servo Frame***

For **FLAMINGO Elektro** – complete the following additional steps:

Position the servo mounting frame and glue in place as described above. Now glue the three identical battery support pieces together – to form a 9mm laminated support piece. Once cured, bond the 9mm laminated support piece into the fuselage opening at the rear of the servo mounting frame as shown.

Now assemble the flight battery tray and the associated support former and position the assembly to the rear of the servo mounting frame such that the flight battery tray rests on top of the laminated support piece.

**Note:** The precise positioning of the components installed in the nose of the fuselage will depend to some degree on your choice of motor, flight-pack and receiver battery. Check the physical layout of the components, bearing in mind the recommended centre of gravity point.

Once satisfied that the position of the flight battery tray (such that the model can be balanced at the recommended centre of gravity) the battery tray is fixed to the laminated support piece using the two screws provided.

### ***Fig 7 & 8. Servo Frame & Battery Mount***

#### **Completing the fuselage control linkages.**

Cut the rudder and elevator linkages to length and solder clevis adaptors securely to the wire ends having first thoroughly cleaned and prepared the joint. Fit clevises and lock-nuts and adjust accordingly such that the control surfaces are held at neutral when the servo positions are centred.

**Tip.** Suitably thickened epoxy may also be used to fix the clevis adaptors to the control linkages (as an alternative to solder). This method is more appropriate in the case of glass fibre push rods. In either case it is good practice to apply a small piece of heat-shrink tubing over the joint.

## Electric Motor Installation (\*)

The nose of the FLAMINGO Elektro is prepared to accept the recommended motor. Some adjustment may be required to accommodate alternative drive systems.

**Note:** Be sure to make provision for adequate air-intake to cool the drive system. Some customers may prefer to use a so called Turbo-Spinner which provides for intake of air through the spinner itself, but make sure that adequate cooling is provided.

Prepare the area where the motor mount is to be bonded to the inside of the fuselage nose with a coarse abrasive paper (80 grit) to ensure a good bond. The motor mount should be installed about 1mm back from the edge of the fuselage nose and installed so as to provide 3° down-thrust and 2° side-thrust (depending upon your choice of drive system). Carefully position the motor mount in place and secure with a few drops of instant adhesive before finally bonding in place with a bead of suitably thickened epoxy.

**Tip:** Fit a long nylon bolt through the centre hole in the motor mount and use the protruding part of the bolt as an aid to adjusting the precise amount of down-thrust and side-thrust. The bolt also serves as a useful handle while positioning the motor-mount in place.

With the motor temporarily installed, fit the propeller yoke and spinner and check the alignment of the fuselage nose with the spinner. Carefully grind the front of the fuselage nose to match the profile of your chosen spinner.

Only when the motor-mount is secure, install the motor (remember to use lock washers) and ensure that the drive shaft turns freely and there is adequate clearances for the propeller yoke and spinner assembly. For the sake of safety, don't install the propeller until the model is complete!

**Note:** Check that the screws used to secure the motor to the motor mount are not too long as they may otherwise foul the internal motor mechanism. You may find it necessary to countersink the mounting screws slightly, to achieve clearance with the propeller yoke/spinner assembly.

### *Fig 9 & 10. Motor Mount*

## The Wings

The wing panels are supplied largely complete and require only the minimum of installation work and finishing.

### Wing / Fuselage Joint

The FLAMINGO 2006 features a floating joiner, meaning that the opening in the fuselage is approx. 1.5 mm larger than the diameter of the wing joiner. This system is widely used in full-size aircraft and has been well proven over many years of model design and manufacture.

The main wing joiner consists of a single  $\varnothing$  10 mm hardened steel wing-joiner which is ample to carry the flight loads. The fuselage is suspended between the wing panels on four steel incidence pins.

Work carefully when drilling the holes in the wing roots to accommodate the incidence pins as these determine then incidence (with respect to the fuselage). Using small screw-clamps, carefully fix small 3mm thick pieces of scrap Balsa to the top and bottom surfaces of the wing at both leading and trailing edges. The upper pieces should be positioned to overhang the wing root by a few millimetres - to act as guides along the fuselage wing fairing.

Position one wing panel carefully against the fuselage fairing at the leading and trailing edge, using the small Balsa pieces as guides, and tape it firmly in place. Now mark the position of the holes for incidence pins on the wing root by working through the holes in the opposite side of the fuselage using a sharpened 3mm steel rod (or similar tool).

Remove the wing and drill the holes in the wing root using a 3mm twist drill. Remember to take account of the wing dihedral; the holes should be drilled parallel to the wing joiner. Once both wings have been marked and drilled, the four incidence pins can be bonded into place using a slow setting thickened epoxy. Be sure to make one pin in each wing a little longer than the other, and round off the end of the pins to facilitate easier assembly at the flying field.

Note! Apply a suitable release agent to the holes in the fuselage sides and to the fairing itself before applying the adhesive, then fit the wings to the fuselage, with the steel joiner installed to allow the epoxy to cure overnight.

### ***Fig. 11 & 12. Floating Wing Joiner***

The supplied Nylon wing locks are used to secure the wing joints. The sockets have already been installed in the fuselage wing root. The matching plugs are required to be glued into the wing roots to complete the joint.

First check the plugs fit the holes provided in the wing roots and adjust if necessary. Once the holes have been adequately prepared, glue the plugs into the wing roots and with the steel wing joiner installed, engage the wings firmly with the mating sockets and ensure correct alignment. Take due care when completing this step to avoid the effects of any excess epoxy.

**Tip.** Cover the fuselage wing roots with kitchen film (or similar material) to protect the surface and apply a releasing agent to the locks themselves while the epoxy cures. Once cured, the wing locks are easily separated by applying firm pressure, by hand, along the leading edge of the wing.

### **Installation of the wing servos.**

The TA Servo LOCK system supplied with your FLAMINGO 2006 kit provides a universal wing servo mounting mechanism which is both simple and very secure.

Remove sufficient polystyrene to the inside the factory prepared servo-wells to accommodate your chosen servos up to the inside of the upper wing skin. Reinforce the area of the upper wing skin with a small piece of 100 g./dm<sup>2</sup> glass cloth and epoxy resin. This prevents stress points in the upper wing skin as a result of installing

the servos. Finally glue the plywood servo mounting frames to servo openings in the wings.

**Note:** In the case of the ARF version, the plywood servo frames are pre-installed at the factory.

The servos themselves are simply bonded to the inside of the servo cover scoop using suitably thickened epoxy and screwed onto the plywood frames (see also the installation note supplied with the TA servo LOCK set). Be sure to roughen the surface of the servo cover to ensure a good bond.

**Tip:** Protect the servos with heat shrink sleeve. This makes for easy removal and replacement of the servo, but care should be taken so as not to overheat the servos while applying the sleeve.

### **Installation of the wing control horns.**

Ailerons: Mark out the position of the aileron control horns on the lower surface of the aileron. The horn should be positioned directly opposite the scoop in the servo cover and about 3 mm from the aileron leading edge.

Drill a series of 2mm diameter holes and cut away the excess to form a neat slot to accommodate the supplied GRP control horns. Take care not to cut through to the upper surface of the aileron and undercut a little of the material inside the slot to allow for additional adhesive.

Locate the aileron control horn such that the eye is at 90° to the hinge line and about 12mm above the lower surface of the aileron.

Flaps: Similarly locate the slots to accommodate the supplied GRP control horns about 3mm behind the leading edge of the flap such that the eye is located about 10mm behind the flap leading edge and about 13mm above the lower surface of the flap.

**Tip:** Make a stencil in the shape of a triangle with 15-20° sides from a scrap piece of plywood and use it to ensure that the eye holes in all control horns are set at the same angle.

Once satisfied with the position, bond the GRP control horns into place using thickened epoxy and allow to cure.

**Note:** ARF customers will need to remove a little of the covering material while those building the ARC version may prefer to wait until after the wings have been covered before bonding the control horns in place.

### ***Fig 13 – 16. Wing Servo & Control Horns***

#### **Wing servos wiring.**

Prepare two cable harnesses to connect the wing mounted aileron and flap servos to the receiver system. The connectors may be either fixed into the wing and fuselage wing fairing roots, or left on flying leads. However you choose to proceed, be sure to use good quality twisted servo leads, with a wire diameter of no less than 0.25 mm<sup>2</sup> and polarised connectors, preferably with Gold contacts.

**Note:** Quality cable sets, including connectors and separation filters are available via the specialist model trade; choose high quality components for optimum reliability. In the case where flying leads are used, take care always to handle the leads only by the connectors. Don't pull on the leads!

ARF customers should now move to installation of the radio control equipment while those building the ARC version should now begin the finishing stage.

## **Finishing.**

**Film covering** – all the wooden surfaces are supplied pre-sanded, but will benefit from further fine finishing prior to covering. Follow the instructions provided with the covering materials, always taking care to make all joins in the direction of the air-flow.

As an alternative to our own high stable decorative vinyl based covering material, we can also recommend Oracover (Profilm) covering materials.

**NOTE:** Take care to avoid excessive heat when using heat-shrink covering films on the wings as the polystyrene cores will be destroyed (polystyrene starts to melt at 70°C). Use low temperature heat-shrink covering films and make every effort to avoid prolonged exposure to heat.

**Fibre-glass finish** – for the ultimate finish to your FLAMINGO 2006, cover the wings and tail-plane with a lightweight glass-fibre cloth and treat with a suitable finishing resin. This involves a specialist process which is well documented in the popular model trade. Choose good quality materials and follow the manufacturer's instructions. Take care not to add excessive weight!

## **DESIGN Models.**

Our DESIGN range of models are supplied with pre-printed graphics which are both lightweight and durable. Please observe the following simple steps to maintain the appearance:

- TA-Film is stable up to a nominal temperature of 70°C so care should be taken not to expose the surfaces to excess heat. The use of a normal hairdryer is all that is required to soften the material should it eventually become necessary.
- The graphics are waterproof but are not resistant to solvents. Clean your model with a mild solution of soapy water applied with a soft sponge and dry carefully to restore the fine finish.
- Do not under any circumstances use cleaning products which contain concentrated alcohol or acetone as a solvent.

## **Radio Control Equipment Installation.**

**Fuselage servo installation** - Install the servos in the servo mounting tray, following instructions supplied with your radio control equipment. Connect the servo output horns and clevises and check full and free movement – using the full range of the servo. Also check for any slop in the push-rods and secure the Bowden cable carriers always keeping mind to minimise the length of unsupported control linkage.

**Note:** Depending on your choice of servos, you may find that you will have to remove a little material in the area of the fuselage opening to accommodate the servo output horns. Do so carefully, removing only the minimum amount of material necessary to install and operate the servos.

**Wing servo installation** - Ensure that the servo output arms are set at 90° with the servo electrically centred. Prepare the linkages, using threaded rod, clevises and lock-nuts remembering to apply a drop of thread-lock to the lock nuts or apply a short length of heat-shrink over the joint.

Secure the servo covers in place using the four small screws provided. Use a countersink tool to recess the screw heads into the servo covers to improve both the appearance and the aerodynamic performance.

**Receiver installation** - The receiver is best installed to the rear of the fuselage cockpit opening, a good quality Velcro Hook & Loop material is quite adequate for this purpose. The receiver antenna is ideally inserted into a suitable antenna tube (or plastic Bowden cable carrier) and inserted down the length of the fuselage

Although there is a certain amount of Carbon used in the construction of the fuselage, we would suggest that there is no problem running the antenna down the inside of the fuselage boom (we fly all our models this way). However, ALWAYS carry out a thorough range test before flying the model and if any doubt whatsoever then allow the antenna to hang freely.

**Tip:** Never install the antenna taught, but allow some slack in the wire to allow for small movements within the fuselage.

The model is now largely complete, but some very important work remains to be done while still in the workshop.

## **Balancing & Adjusting.**

The correct centre of gravity and longitudinal dihedral are first determined theoretically, and then confirmed in practice by test flying model.

### **A successful first test flight is invariably a matter of good preparation!**

Start with the centre of gravity at 92mm behind the root wing leading edge – this has been found to be ideal. You ought to be able to achieve the required balance point by careful location of the receiver battery (and flight battery in the case of the electric version). Be sure all batteries are secure as any movement whilst in flight will impact the correct centre of gravity and adversely affect the proper flying characteristics of the model.

The correct longitudinal dihedral is +1°. This is the angle of the elevator (at the neutral position) with respect to the wing and is best measured using an incidence meter.

The following recommended control throws have been determined following several test flights, confirmed by several different model pilots. We strongly recommend that you begin with the recommended throws and only change them with experience.

## **Recommended control throws.**

The throws are measured at the point of maximum deflection – in millimetres:

### **Normal Flight**

	<b>Up</b>	<b>Down</b>	<b>Left/Right</b>
Rudder			<b>40 / 40</b>
Elevator	<b>12</b>	<b>12</b>	
Ailerons	<b>15</b>	<b>8</b>	
Flaps	<b>0</b>	<b>0</b>	

The flaps may be set to move upwards, half the travel of the ailerons for full control of the trailing edge

### **Thermal Setting**

	<b>Up</b>	<b>Down</b>
Ailerons	<b>15</b>	<b>8</b>
Ailerons (Camber)		<b>1,5</b>
Flaps (Camber)		<b>2</b>

The flaps should not move with the ailerons, but some model pilots prefer to mix the flaps with elevator (Snap-Flap) in this mode.

### **Speed Setting**

	<b>Up</b>	<b>Down</b>
Aileron	<b>15</b>	<b>10</b>
Aileron (Reflex)	<b>0,5</b>	
Flap (Reflex)	<b>1,0</b>	

In this mode the flaps may be set to move both up and down, about half the travel of the ailerons.

## Landing Setting

	<b>Up</b>	<b>Down</b>	<b>Comment</b>
Flaps		<b>Max.</b>	<b>Butterfly</b>
Aileron	<b>10</b>		<b>Butterfly</b>
Elevator		<b>1,5–2</b>	<b>Reach</b>

Your FLAMINGO is now ready for the first test flight.

## First Flights.

Experienced model flyers will now be waiting for the first opportunity to test fly the FLAMINGO and fine-tune the setup to best suit their individual style of flying. The following advice is intended to help those with less experience to carry out the test flight and successfully trim the model:

Every flying machine, from the most humble chuck glider to the full size aircraft, must be test flown and trimmed after completion and your FLAMINGO is no exception. The slightest deviation in manufacture or construction can lead to minor variations in flying characteristics and control responses. Test flying is the means to optimise the centre of gravity and generally fine-tuning the control response.

Avoid repeated low altitude hand launches on a flat site as this is the most likely opportunity for damage to occur as there is little time to make adequate corrections when the model is flying close to the ground.

Ensure that both transmitter and receiver batteries are fully charged and carry out a thorough range test in accordance with the instructions supplied with your radio control equipment. Do not fly the model if you are in any doubt about the integrity of the radio control system – seek further assistance.

### **Faults do not cure themselves!**

Test flights can be carried out in several ways depending on the version of the model you have chosen; at a slope site from a hand launch, at a flat-field site using a winch, or from an aero-tow. In all cases always launch the model into wind with the wings level and adjust the trims as necessary to achieve straight and level flight.

Check the centre of gravity once the model is flying at a safe height and comfortably above the stall speed. Apply down elevator to place the model in a steep dive and then allow the elevator to return to neutral and observe the flight path:

- If it recovers in a gentle upward arc, without any further control inputs and without ballooning up above the horizontal, then the CoG can be considered to be about right.
- If the model bounces quickly out of the dive and climbs strongly, the CoG is too far forward. Readjust the battery position, or remove a little lead from the nose and repeat the test.
- If however the model shows no tendency to recover, or indeed if it shows signs of tucking under, the CoG is too far back. Readjust the battery position, or add a little lead from the nose and repeat the test.

## **Safety.**

Our hobby is very important to us and as such it is essential that we recognise the responsibilities associated with the building and flying of model aircraft:

- Carefully built models exhibit outstanding flying characteristics and the highest levels of reliability and safety.
- Always carry out thorough pre-flight checks – observing structural integrity of the model as well as correct movement and sense of all the flying surfaces.
- Always carry out a through range check on all new models or following any change of RC components.
- Always check that your channel is free before switching on your transmitter.
- Adequate third-party insurance is essential. Check the local laws governing model flying in your region before flying your model.
- Give due consideration to others when flying aerobatic manoeuvres and never fly low and/or fast over other people.
- Always be aware of the vulnerability of each individual component of your RC system and maintain it responsibly.
- Always give due consideration to other model flyers, provide ample air-space and observe the local system of channel allocation.

**If in doubt – please ask.** If you are unsure about any aspect of flying your model safely, please seek the advice of an experienced aero-modeller or contact your dealer.

## Parts List.

Qty	Description	Purpose	Material	Dimension
1	Building Instructions		DIN A4	
1	Fuselage		GFK white	Ready made
1	Canopy		CFK	Ready made
1	Pair wing panels		Foam/Obechi	Ready made
1	Pair tail-plane panels		Foam / Obechi	Ready made
1	Rudder		Balsa	Ready made
1	Wire set		Metal / Plastic	
1	Hardware accessory pack		Diverse	
1	Set servo locks		Plastic / Wood	
1	Wing joiner		Steel	D10*245
<b>Wooden Parts</b>				
1	Pin / grooved support	Canopy	Obechi	Ready made
1	Servo frame	Fuselage	CNC cut plywood	
1	Fuselage former	Fuselage	CNC cut plywood	
3	Battery tray support	Fuselage	CNC cut plywood	
1	Battery tray	Fuselage	CNC cut plywood	
1	Battery tray	Fuselage	CNC cut plywood	
1	Motor mount	Fuselage	CNC cut plywood	
<b>Hardware Accessories</b>				
7	Metal clevis	Control linkages	Steel	M 2
3	Clevis adaptor	Control linkages	Steel	M 2
4	Threaded rods	Control linkages	Steel	M 2
5	Eye bolts	Control linkages	Alu	M 4
7	Lock nuts	Control Linkages	Brass	M 2
2	Wing lock socket	Wing lock	Nylon	
2	Wing lock plug	Wing lock	Nylon	
2	Tail-plane joiners	Tail-plane	Steel	Ø 3*130
1	All flying tail crank(built-in)	Fuselage		
1	Tow hook	Tow hook	Steel	
2	Incidence pins	Wings	Steel	Ø 3*40 (50)
2	Self-taping screws	Battery tray	Steel	D2,2*13
2	Eye bolts	Rudder hinge	Alu	M 4 (Ø 2)
<b>Wire set</b>				
2	Steel wire pushrods	Rudder / Elevator	Spring steel	Ø 1,4*1100
1	Bowden cable outer	Antenna tube	PVC tube	Ø 3*700
1	Steel wire	Rudder hinge	Spring steel	Ø 2*400
1	Bowden cable outer	Aero-tow release	PVC tube	Ø 3*400
1	Steel wire	Aero-tow release	Spring steel	Ø 2*400
<b>Servolocks</b>				
4	Servo frames	Wings	Plywood	Ready made
2	Servo covers (scoop left)	Wings	Plastic	Ready made
2	Servo covers (scoop right)	Wings	Plastic	Ready made
16	Self tapping screws	Wings	Steel	M2*10
1	Installation notes	Wings	Paper	DIN A5

**Note: Contents and technical details subject to change without notice.**