Order. No. **41950**
41960

Instructions

ALPINA 3001 ELEKTRO

Electric-powered model glider

This model requires a six-function radio control system.

GRAUPNER GmbH & Co. KG D-73230 KIRCHHEIM/TECK GERMANY
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Specification

Wingspan approx.	3001 mm
Overall length approx.	1420 mm
Wing section	TA-30 series, 8.3 %
Tailplane section	10%
Wing area approx.	48.2 dm²
Tailplane area approx.	4.2 dm²
Total surface area approx.	52.4 dm²
Min. all-up weight, according to fittings, approx.	2450 g
Longitudinal dihedral approx.	1° - 1.3°
Centre of Gravity approx.	84 - 88 mm aft of the wing root leading edge

Important safety notes

You have acquired a kit which can be assembled into a fully working RC model when fitted out with suitable accessories. However, we as manufacturers have no control over the way you build and fly your RC model aircraft, nor how you install, operate and maintain the associated components, and for this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of the GRAUPNER company to pay compensation, regardless of the legal argument employed, is excluded. This includes personal injury, death, damage to buildings, damage due to loss of business or turnover, interruption of business or other direct or indirect consequent damage whose root cause was the operation of the model.
The total liability in all cases is limited to the amount of money which you actually paid for this model.

This model aeroplane is built and flown at the sole and express responsibility of the operator. The only way to avoid injury to persons and damage to property is to handle and operate the model with the greatest care and consideration at all times.

During construction

When handling adhesives and solvent-based materials it is important to observe the safety notes and instructions supplied by the manufacturer. Many glues and solvents are capable of causing injury and damage to materials if they are not used competently. Take waste glue and paint to your local model shop or toxic waste collection centre.
Note that balsa knives, pins, etc. have sharp points and edges, and should be handled carefully to avoid injury.
Take care to keep tools, adhesives and paints out of the reach of children.
A large, unobstructed working surface is a great advantage for all types of model-making.
If you are a relative beginner and are not sure of any process, it is always best to ask an experienced modeller for help.

Flying the model
Never fly your **ALPINA 3001 Champ ELEKTRO** in a nature reserve or any other protected site. Please don't disturb the animals and plants which live in the countryside.
Trees and bushes are the natural habitat of many birds, and also serve as nesting sites and general protection for them.

Before you fly the model for the first time it is essential to take out a special insurance policy designed to cover modelling risks.
These safety notes should be kept in a safe place. If you ever dispose of the model, be sure to pass them on to the new owner.

Manufacturer's declaration:
If material defects or manufacturing faults should arise in a product distributed by us in the Federal Republic of Germany and purchased by a consumer (§ 13 BGB), we, Graupner GmbH & Co. KG, D-73230 Kirchheim/Teck, Germany, acknowledge the obligation to correct those defects within the limitations described below.
The consumer is not entitled to exploit this manufacturer's declaration if the failure in the usability of the product is due to natural wear, use under competition conditions, incompetent or improper use (including incorrect installation) or external influences.
This manufacturer's declaration does not affect the consumer's legal or contractual rights regarding defects arising from the purchase contract between the consumer and the vendor (dealer).

Extent of the guarantee

If a claim is made under guarantee, we undertake at our discretion to repair or replace the defective goods. We will not consider supplementary claims, especially for reimbursement of costs relating to the defect (e.g. installation / removal costs) and compensation for consequent damages unless they are allowed by statute. This does not affect claims based on legal regulations, especially according to product liability law.

Guarantee requirements

The purchaser is required to make the guarantee claim in writing, and must enclose original proof of purchase (e.g. invoice, receipt, delivery note) and this guarantee card. He must send the defective goods to us at his own cost, using the address stated above.
The purchaser should state the material defect or manufacturing fault, or the symptoms of the fault, in as accurate a manner as possible, so that we can check if our guarantee obligation is applicable.
The goods are transported from the consumer to us and from us to the consumer at the risk of the consumer.

Duration of validity

This declaration only applies to claims made to us during the claim period as stated in this declaration. The claim period is 24 months from the date of purchase of the product by the consumer from a dealer in the Federal Republic of Germany (date of purchase). If a defect arises after the end of the claim period, or if the evidence or documents required according to this declaration in order to make the claim valid are not presented until after this period, then the consumer forfeits any rights or claims from this declaration.

Limitation by lapse of time

If we do not acknowledge the validity of a claim based on this declaration within the claim period, all claims based on this declaration are barred by the statute of limitations after six months from the time of implementation; however, this cannot occur before the end of the claim period.

Applicable law

This declaration, and the claims, rights and obligations arising from it, are based exclusively on the pertinent German Law, without the norms of international private law, and excluding UN retail law.

The following points are important and must be observed at all times:

- Before you fly the model check that the radio control system is working reliably, and that all connections are secure.
- The batteries must be charged and the range of the radio control system must be checked before you operate the model. In particular, the radio control system batteries must be fully charged before each session.
- Ensure that the channel you intend to use is not already in use by other modellers. Never fly the aeroplane if you are not certain that your channel is free.
- Read and observe the instructions and recommendations provided by the manufacturer of your radio control system and accessory components.
- Ensure that the servos are not mechanically obstructed at any point in their travel.
- Dry cells and rechargeable batteries must never be short-circuited.
- Remove all batteries from the model prior to transporting and storing it.
- Do not subject the aircraft to dirty or cold conditions, or high levels of humidity or heat.
- Secure the model and your RC equipment carefully when transporting them. They may be seriously damaged if they are free to slide about.
- **IMPORTANT:** when the flight battery is exhausted, you must not dispose of it in the household waste. Take the pack to your local battery reclamation centre.
  IMPORTANT: when the useful life of the model and the transmitter are over, do not discard them in the domestic rubbish. The electric and electronic components

in particular must be taken to your nearest electrical recycling centre. Ask your local authority if you are not sure of its location.

Pre-flight checks

Check that the radio control system works correctly and at full range before every flight: switch on the transmitter and the receiving system, and extend the transmitter aerial to its full length; walk away from the model, and check that all the control surfaces work smoothly and immediately at an appropriate distance; check also that they deflect in the correct “sense” in relation to the stick movements.
If you are a relative beginner to this type of model flying, we recommend that you enlist an experienced model pilot to help you check and test-fly the machine.

Care and maintenance

- Clean the model carefully after every session. The aeroplane and RC components should only be cleaned using suitable cleaning agents. Ask your model shop for information.
- When cleaning any types of printed decoration (decals, design films) it is important to avoid using solvent-based cleaners, as such agents may ruin the printing. Use nothing more than a mild liquid detergent solution and a soft cloth.

Notes on building the model

It is essential to read right through the building instructions before starting work on the model. Bear in mind the hazards involved in the use of tools.
Before making any glued joints, be sure to clean the surfaces and remove all traces of grease. We recommend sanding lightly, before wiping with a non-greasy cleaning agent. Before gluing parts to the fuselage it is essential to roughen the surfaces with fine abrasive paper and de-grease them with acetone or similar solvent, otherwise you will not obtain strong, durable joints. This applies in particular to moulded GRP fuselages.

Tools required to build the ALPINA 3001 Champ ELEKTRO

Pencil (HB lead), felt-tip pen, setsquare, tape measure or metre rule, household scissors, sharp narrow-bladed knife, e.g. balsa knife, Order No. 980, small electric drill, set of twist drills.

Gluing different materials
The following table gives examples of some typical joints, but it makes no claim to be comprehensive.

Materials	Typical joint	Adhesive Order No.
GRP to steel wire	Canopy to latch wire	UHU plus endfest 300 Order No. 950.43
GRP to wood	Fuselage to servo plate	UHU plus endfest 300 Order No. 950.43

Note:

Areas of the fuselage which are to be glued should be rubbed down with fine-grit abrasive paper to remove any traces of mould release agent. Carefully remove all sanding dust. Aim at reducing the glossy surface to a **matt** finish, otherwise there is no chance of a durable glued joint between the fuselage and other parts.
When using adhesives it is important to observe the instructions supplied by the manufacturer. The main Graupner FS catalogue includes many other types of glue.
Ensure good ventilation in your workroom when using solvent-based adhesives.
Read the manufacturer's instructions.

Important note

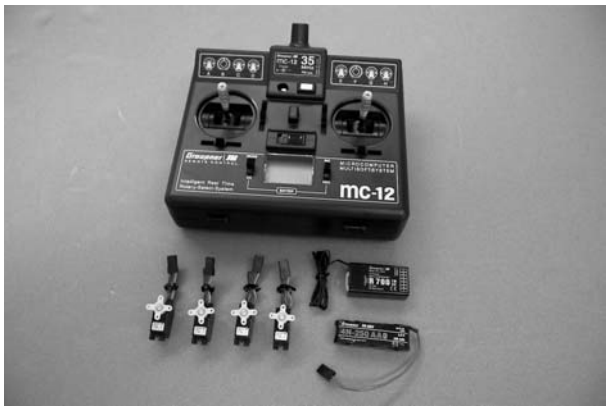
It is essential to avoid using solvent-based glues for any joint in which the adhesive comes into contact with the styrofoam wing core. This applies in particular to cyano-acrylates, as these materials immediately attack the foam and cause large-scale damage; in most cases the component is rendered unusable. Use only solvent-free adhesives; we recommend UHU-Endfest (24-hour epoxy resin) or epoxy laminating resin thickened with chopped cotton strands. Do not use 5-minute epoxy for joints which are vital to airframe integrity, or for crucial control linkages!

Note regarding: "gluing with epoxy"

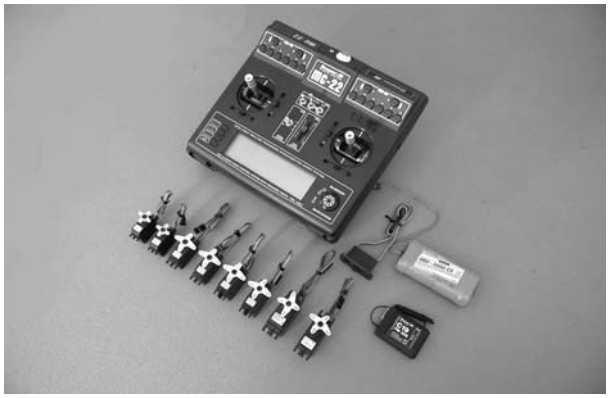
Epoxy laminating resin is not an effective adhesive on its own! These resins only work well as glues when thickened with various additives. You can adjust the qualities of your adhesive by choosing the appropriate additive to suit your application:

1. *Chopped cotton strands produce a tough, flexible joint.*
2. *Super-fine glass fibres produce a rock-solid joint which is easy to sand.*
3. *Micro-balloons transform epoxy resin into a lightweight filler paste.*

Radio control system
We particularly recommend: mx-12 to mc-24 computer systems



or



Recommended servos:

For rudder and elevator	DES 678 BB MG	Order No. 7943
For ailerons and flaps	DES 448 BB MG	Order No. 7914
Receiver power supply	PRX-3A	Order No. 4135

Suitable receivers include the DS 19, SMC 19 and SMC 14.

Servo extension leads required

Order No. 3935.18 For permanent connection to the receiver 4 reqd.

Electric motor and accessories

Motor Order No.	Propeller Order No.	Spinner Order No.	Flight battery Order No.	Speed controller Order No.
COMPACT 540 **7720**	40 x 25 cm **1336.40.25**	42 mm Ø **6042.5**	LiPo battery, 3/3200 mAh **7657.3**	BRUSHLESS CONTROL 70 **7237**

See the main FS catalogue for details of suitable battery chargers.

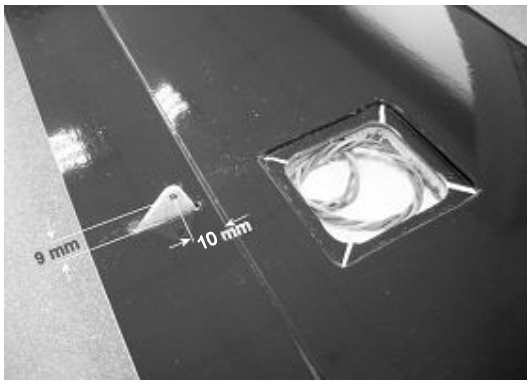
Assembling the ALPINA 3001 Champ ELEKTRO

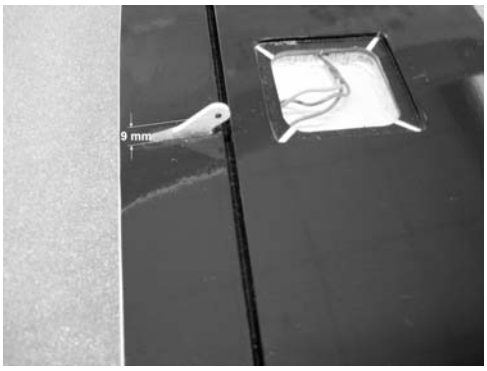
Please don't start work on the model until you have read through the instructions and understand the purpose of the various components and stages of construction. If you are not satisfied with the quality of any part, take it back to your model shop for replacement before modifying it in any way.

The wings

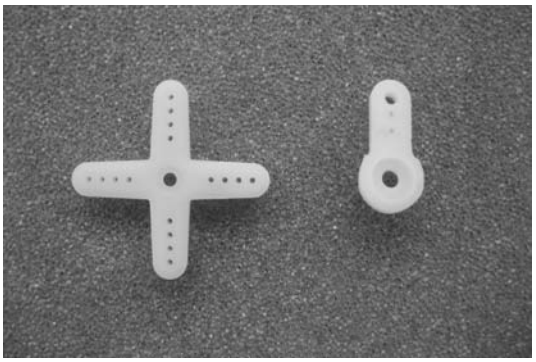
Use your fingertips to locate the horn slots in the ailerons and flaps, remove the covering film over them using the tip of a hot soldering iron or a sharp balsa knife, then trim them as required so that the horns are a snug fit. The GRP horns should be glued in the slots as shown in the two photos, taking care to produce really strong joints.

The slots are machine-cut to approximately the correct depth, but you may need to make minor adjustments by removing a little more of the foam core. Ideally you should aim at removing foam inside the slots until the veneer is exposed, in this case with the grain running at RIGHT-ANGLES to the wingspan.



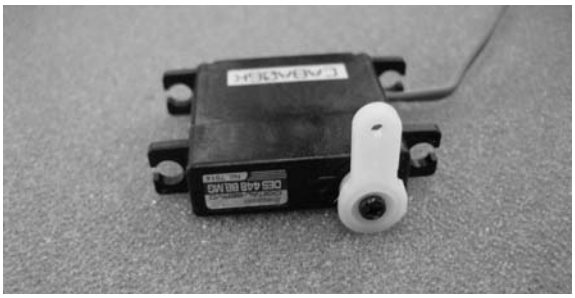


While the glue is curing you can use the time to cut down the servo output levers to the shape shown in the photo. Drill out the outermost hole in the output arm to 1.6 mm Ø to suit the threaded steel pushrod.



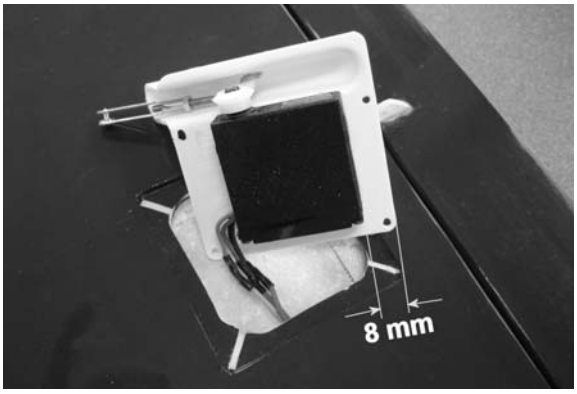
Centre the servos, then push the prepared output arms onto the servo output shafts and fit the retaining screws.

The servos are centred by switching on the RC system and setting the trims to neutral.

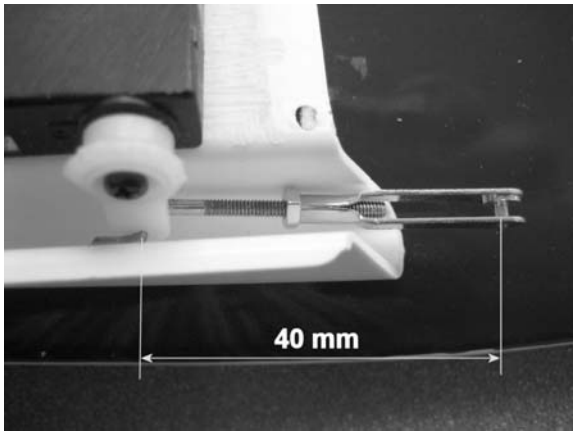


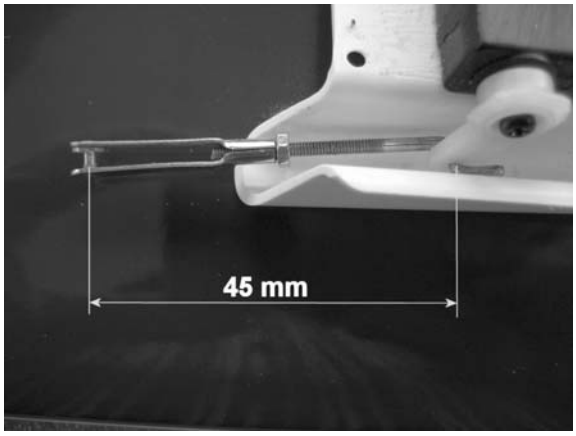
The next step is to glue the servos to the servo well covers, but first you will need to solder the servo leads to the extension leads (already present in the wings), and remove the servo mounting lugs. Solder the joints carefully, ensuring that you maintain correct polarity, i.e. connect like colours of wire together. Insulate each soldered joint with a separate heat-shrink sleeve, which must be fitted onto the wire before the joint is soldered.

The servos can now be glued to the covers as shown in the photo: the output arm must be positioned in the centre of the pushrod fairing, and there should be an 8 mm gap between the servo and the edge of the moulding, as shown below.
Thoroughly sand the servo well cover and the servo case before gluing them together.
It is possible to use cyano, Order No. 5821, for these joints, but in this case you must ensure that the servo is positioned correctly “first time”, i.e. you will have no opportunity to adjust the servo position if you use cyano.



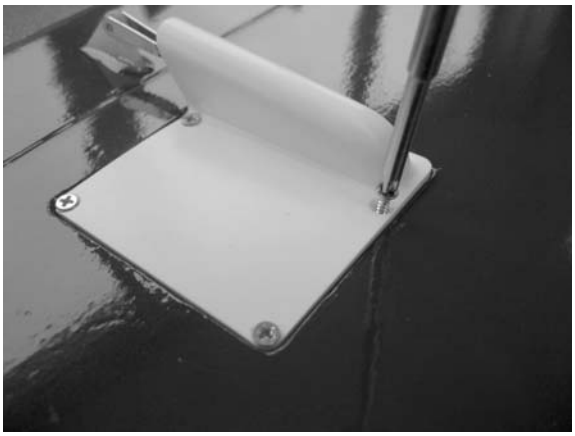
Each aileron and flap pushrod is assembled using an M2 threaded rod, an M2 nut and an M2 clevis, as supplied in the kit. Note that the angled end of the aileron push-rods must be formed in such a way that the distance between the linkage hole on the servo output arm and the clevis linkage pin is 40 mm. For the flaps the same dimension is 45 mm. Final adjustment can be made later by screwing the clevis in or out on the threaded rod, once you have screwed the servo cover in place.





It is essential to apply a drop of UHU schraubensicher (thread-lock fluid) between the clevis and the locknut to prevent the clevis working loose.

You can now connect the clevises to the control surface horns, and fix the servo well covers in place using the countersunk screws supplied; drill pilot-holes for the screws beforehand. TIP: if you want the last word in aerodynamic efficiency you can countersink the screw-holes in the moulding.



There are two possible methods of connecting the servos to the receiver: one is to route the servo extension leads from the receiver out of the openings in the fuselage, and then connect them to the extension leads in the wings when the model is rigged; the other is to solder the extension leads to the wing servo quick-connectors, Order

No. 2972 and 2973. In this case the servos are connected automatically when you plug the wing panels into the fuselage.

The four incidence pegs must now be glued in the wing root ribs so that the wings have a fixed location relative to the fuselage, and cannot swivel on the wing joiner.

Open up the rectangular holes in the root fairings on the fuselage, cutting along the marked lines using a rotary cutter and / or a file. Leave about 1 mm space all round the opening for the wing joiner.

Drill 3 mm Ø holes in the wing root ribs for the incidence pegs, drilling to a depth of 50 mm. To check the fit, plug the two wing panels into the fuselage using the rectangular CFRP joiner and the incidence pegs. Take care not to push the steel dowels right into the wings.

Wing joiner

The aerodynamic forces of the ALPINA 3001 ELEKTRO are absorbed by a rectangular-section carbon joiner which fits into a hybrid carbon spar in the wings. The wing joiner is a high-quality hand-made laminated component which incorporates the correct dihedral, and is immensely stiff and strong. Although the parts are carefully standardised it is still possible that you will find minor tolerances in the fit. This is not a quality defect, and any tightness can be eliminated with a few careful passes of 120-grit abrasive paper.

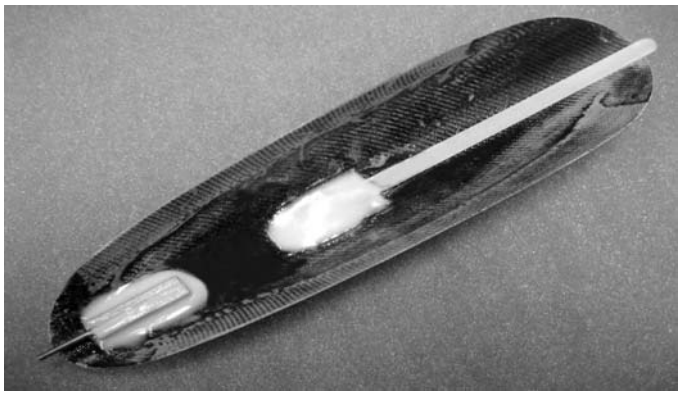
While the wings are plugged into the fuselage, please check that the tailplane lines up correctly with the wings. You will find a small compression strut in the wooden parts bag. Install this component between the wings close to the trailing edge, and adjust its position to correct any minor production tolerances in the wing sweep angle. It is important to epoxy the compression strut in place at this stage.
When you are confident that everything fits correctly, you can glue the incidence pegs in the wing root ribs. Ensure that the pegs project out of the wings by different amounts: ideally this will be around 10 mm for the rear pegs, and about 7 mm for the front ones. This makes it much easier to assemble the model at the flying field. Leave the model components fitted together until the epoxy has cured completely.
TIP: before mixing the epoxy, it is a good idea to mask out the wing root ribs and the facing ribs at the fuselage root fairings using wide adhesive tape, as this makes it much easier to remove excess resin later. The tape also helps to prevent epoxy being forced into the socket of the Multilock wing retainer.

The final work on the wing panels is to glue the Multilock pegs in the blind holes in the wing root ribs: push the pegs into the sockets in the fuselage until they engage. Offer up the wings, and make any minor adjustments required to the blind holes in the root ribs. Apply glue to the inside of the blind holes in the wing root ribs, then push the wings up against the fuselage so that the incidence pegs fit into the holes in the fuselage, with the wing panels resting snugly against the facing ribs. Leave the wings plugged into the fuselage until the glue has set hard.
TIP: use slightly flexible adhesive tape (e.g. paper masking tape) to hold the wings against the fuselage. When the glue has cured completely, carefully peel off the tape before removing the wings from the fuselage once more.

Fuselage and canopy

Installing the canopy latch

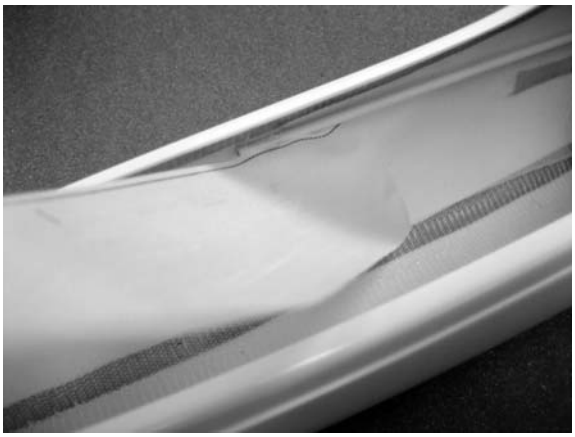
Trim the canopy pin support rail (channeled hardwood strip) to fit inside the canopy. Carefully de-burr the steel locating pin, round off the end, and glue it in the support rail; note that the pin must project beyond the end of the rail by about 22 mm. Glue the pin support rail in the canopy in such a way that the pin projects by about 6 mm beyond the edge of the moulding. There should be a gap about 3 mm wide between the pin and the inside face of the canopy. Using a round file, carefully file a small notch in the front of the canopy flange to accommodate the canopy retaining pin. Take care: don't file away too much material! The canopy is retained on the fuselage by a GRP leaf-spring; the spring should project beyond the rear end of the canopy by 10 mm. Tack the canopy spring in place with cyano, then epoxy one or two layers of 160 g glass cloth over it and onto the canopy, over a length of 50 to 60 mm. Remember to sand the joint surfaces with 80-grit abrasive paper before applying the glue.



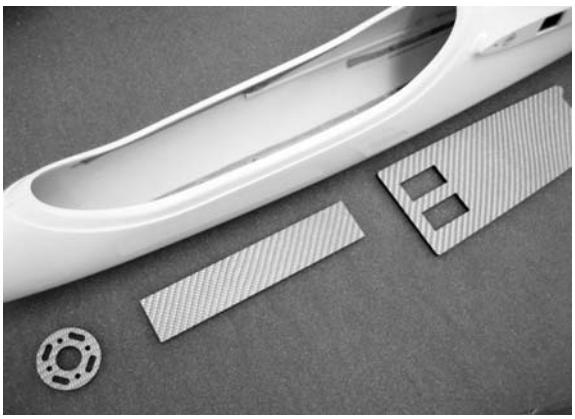
The canopy can be fitted on the fuselage once the resin has cured: place the canopy in the recess, and engage the GRP tongue at the rear end. Push the canopy towards the tail until the pin clears the front flange, and can be engaged in the notch, then slide it forward again until the canopy fits snugly in the recess.

When you slide the canopy forward, it will naturally centre itself on the fuselage flange.

Before the RC plate is glued in the fuselage, the special peel ply on the inside of the fuselage sides must be removed as shown in the picture.

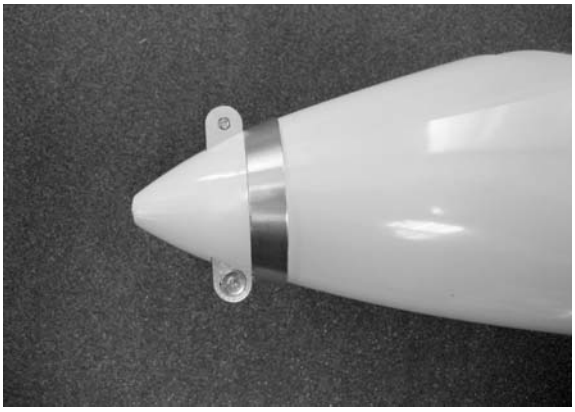


Installing the RC components and the electric motor in the fuselage
The three laser-cut plates must be glued in the fuselage to support the electric motor and the receiving system components.

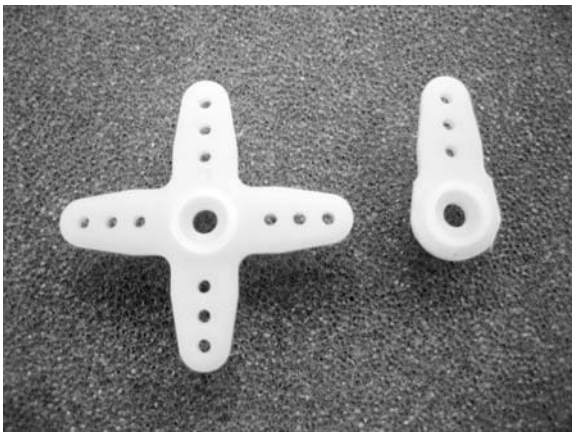


Attach the electric motor to the motor bulkhead using the retaining screws supplied with the motor.

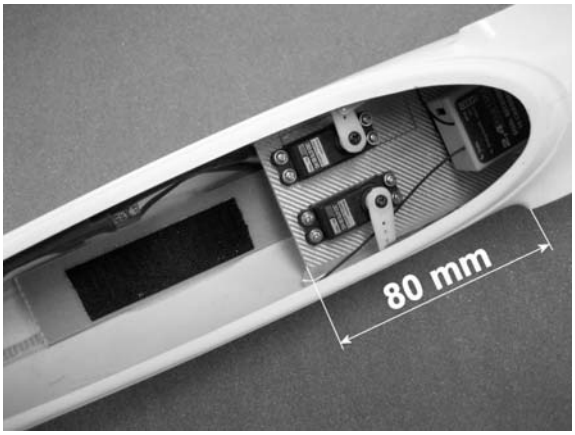
Place the electric motor assembly in the fuselage, working from the canopy opening. Fit the spinner loosely on the motor shaft, and position the motor in such a way that the spinner backplate is exactly parallel to the front face of the fuselage. Carefully withdraw the spinner cap, apply adhesive all round the joint area, and then fit the spinner cap again. Leave the spinner cap in place while the glue is hardening, so that the motor cannot shift out of position.



Cut down the servo output levers to the shape shown in the photo, centre the servos from the transmitter, and push the output arms onto the servo output shafts.



Screw the servos to the RC plate, then glue the plate in the fuselage, positioned as shown in the photo below.



The flight battery can be fixed to the battery plate using Velcro (hook-and-loop) tape. Once you have established the correct Centre of Gravity, mark the battery's position using a pencil.

Installing the catapult hook

The catapult hook is required for the launching aid for the **Alpina 3001 Champ ELEKTRO**. It is installed in a similar manner to the towhook, except that the hole position should be 150 mm from the point of the fuselage nose.

The tailplane
The all-moving tail crank is factory-installed on this model, but you may need to make minor adjustments to the guide slot for the rear tailplane joiner wire. Plug the tailplane panels into both sides of the fin using the two 3 mm Ø steel dowels: the one dowel fits through the front pivot hole in the fin, the second through the rear hole in the crank, working through the machined slots in the fin. The two tailplane panels can now be pushed onto the steel dowels on both sides.

CAUTION: it is essential to remove any rough or sharp edges from the ends of the steel dowels before fitting the tailplane panels for the first time. The tail panels are retained by an integral clamp which could be ruined by rough edges on the steel dowels if you force them into place.

CAUTION: if your model is the ARC version, please ensure that the tailplane panels are the right way up; the top surfaces are marked with a dot at the root rib.

The rudder
Use your fingertips to locate the hinge points on the leading edge of the rudder. Remove the covering film over the slots, and mark their position on the fin sealing strip (trailing edge). Drill 3 mm Ø holes at the marked points on the sealing strip, taking care to drill them in the centre of the strip. Attach the ring-screws to the rudder by sliding the pivot rod (2 mm Ø GRP) through the hole from either end. Now offer up the two ring-screws to the holes in the fin sealing strip, and carry out any minor adjustments required; this is also a good time to check the rudder travel to each side of centre. The two ring-screws can now be glued in the holes in the fin sealing strip. Allow the epoxy to set hard before gluing the horn in the bottom end of the rudder: bend the end of the rudder pushrod at right-angles, fit the horn on the angled end, and mark its position on the rudder. Drill a 4 mm Ø hole in the rudder, raked forward at such an angle that the linkage hole lines up with the hinge pivot axis.

Assembling the **ALPINA 3001 Champ ELEKTRO**
Fit the rectangular wing joiner through the fuselage. Slide the wings onto the joiner to the point where the servo extension leads can be connected. Finally push the wings in until the Multilocks engage, and hold the wings firmly against the fuselage.

Important: the wing and tailplane panels must be held securely in place; it must not be possible for them to slide outwards, away from the fuselage.

The Finish

CAUTION!!!

Like other models in our range, the Alpina is manufactured using LTSCP technology, aimed at obtaining the optimum balance between airframe strength and weight. This technique permits a reduction in the thickness of the wing skins, and their ability to conduct heat is therefore very great. Styrofoam melts at temperatures above 70°C, and to avoid ruining the foam cores it is essential to use types of decal film which have low-temperature adhesive. Whatever film you use, it is important to apply the heating tool as briefly as possible.

We therefore recommend the use of low-temperature decal films, especially self-adhesive types.

Balancing the ALPINA 3001 Champ ELEKTRO

Assemble the model completely, ready to fly, and support it under the wing roots on both sides of the fuselage at a point around 84 mm from the root leading edge; the model should now balance level, preferably with the nose inclined slightly downward. The lead ballast required to obtain correct balance must be secured permanently in the fuselage nose, so that it cannot possibly shift in flight.
Before flying the model for the first time it is important to set all the control surfaces accurately to centre (neutral position), with the transmitter trims also at centre.

Control surface travels

Ailerons	25 mm up	10 mm down
Elevator	10 mm up	10 mm down
Rudder	10 mm left	10 mm right

Thermal setting

Ailerons	1.5 mm down
Flaps	3 mm down

Speed setting

Ailerons	2 mm up
Flaps	1.5 mm up

Butterfly (Crow) setting

Ailerons	18 mm up
Flaps	65 mm down
Elevator	3 mm down

(max. means trailing edge or bottom edge of fuselage)

If you cannot obtain the stated control surface travels by adjusting the mechanical linkages, use your transmitter's DUAL RATE function to set them.

Important:
When installing and setting up the control surface linkages it is vital to ensure that they work smoothly, are able to carry out their full movement - including trim travel - without being impeded, and are not mechanically obstructed at any point.
When you move the rudder stick to the right, the rudder should also deflect to the right (left stick: left rudder). If you pull the elevator stick back towards you, the trailing edge of both tailplane panels should deflect up (stick forward: elevator down). Move the aileron stick to the right, and the right-hand aileron should deflect up, the left-hand aileron down. When you pull the Butterfly (Crow) stick back towards you, both ailerons should rise, and both flaps should fall. It is best to assign the flaps to a slider, and apply electronic limits to their movement, so that the stated travels are obtained at full travel of the slider.

The first flight

"Old hands" will now be waiting for the first opportunity to take their new **Alpina 3001 Champ ELEKTRO** to the flying site, where they will test-fly it in the accustomed manner, carry out any minor corrections required, and then, we hope, have many hours of pleasure flying their new model.

The following is intended to help the less experienced modeller to test-fly and trim the model correctly, and to exploit the model's fine performance to the full.

Test flying

Every flying machine, from the humble chuck glider to the full-size aircraft, has to be test-flown and trimmed after completion; your **Alpina 3001 Champ ELEKTRO** is no exception. The slightest inaccuracy in construction can lead to a minor variation in the model's flight characteristics and control response. Test-flying is the process of optimising the CG, and of fine-tuning the model's control response.

Repeated hand-glides at a flat-field site should be avoided at all costs. The most dangerous time for any model is when it is close to the ground, and hand launches are therefore by their nature extremely hazardous. There is hardly any time to correct the controls, and a hard landing can easily damage the model.

Range testing (even for experts)

Ensure that your transmitter and receiver batteries are freshly charged according to the battery manufacturer's recommendations. Before switching on your transmitter make certain that your channel is vacant. The channel pennant on your transmitter aerial is obligatory, and shows other pilots which frequency you are using. If there are other pilots present, tell them loud and clear which channel you are on, and find out which frequencies they are using.

Before the first flight you should carry out a range check, and we strongly recommend that you repeat the test before the start of every day's flying. Hold the model in such a way that your body cannot influence the receiver aerial, i.e. hold it by the fuselage nose. Your assistant should collapse the transmitter aerial fully (but leave it attached), then walk away from you carrying the transmitter.

As the range increases your assistant should operate one transmitter function constantly while you watch the model's control surfaces. The servos not being moved should remain motionless up to a range of about 80 m, and the moving servo should follow the stick deflections immediately and smoothly. If this is not the case, check first that your channel really is vacant. If so, pack up your entire RC system (complete with batteries, switch harness and servos) and send it back to the equipment manufacturer for checking.

Faults don't cure themselves!

This test can only work effectively if the radio band is not suffering interference, and if no other RC transmitters are switched on - even if they are on other channels. In high mountains such tests are not useful due to extreme the field strengths and excessive range of other transmitters. If you are not sure of anything, please don't risk a flight, even though your fingers can't wait to move the sticks, and your friends are egging you on.

The first flight

The first flight can be carried out in any of several ways - at the slope from a hand-launch, at a flat field.

At the slope you should wait for a period of reliable lift and launch the model with the wings level and the nose down. Don't worry if the model dives at first - speed is half the battle!

If necessary adjust the trims to achieve straight flight and a reasonable cruising speed.

The next step is to fly turns alternately to left and right to check the model's turning characteristics, the harmonisation (balance) between ailerons, elevator and rudder, and the aileron differential. Be sure also to deploy the brakes (butterfly / crow) so that you have a chance to see the change in pitch trim.

If you still have plenty of height you should check the Centre of Gravity right at this early stage. The procedure for CG testing described here is a method of fine-tuning the model's balance. It can only work when air movements are slight, and when the initial CG position is

approximately correct. It is bound to fail if the model is a long way out of balance and / or there is a strong wind. In breezy conditions it is difficult to set up the model for normal cruise speed, as it is hard to judge its speed relative to the surrounding air.

Trim the model carefully for normal cruising speed, which should be comfortably above stalling speed. The model should show no tendency to “hunt” up and down, or mush along close to the stall. It should respond normally to all controls. Keep the flaps at the “neutral” position.

Now - assuming that you have plenty of height in hand - apply full down-elevator briefly to place the model in a vertical dive. Immediately centre the stick and watch the aeroplane carefully. If it recovers to normal flight in a broad, gentle curving arc (100 m) by itself, without ballooning up above the horizontal, then the CG is correct.

If the model bounces up again immediately and climbs strongly, the CG is too far forward.

Remedy: remove lead ballast from the fuselage nose; apply slight down-elevator trim.

If the model shows no tendency to recover by itself - the dive may even become steeper - the CG is too far aft.

Remedy: immediately recover the model with gentle up-elevator. Add a little lead ballast to the fuselage nose, fix it securely, and apply a little up-trim.

Flat-field flying

Flat-field flying is relatively non-hazardous since there is no risk of the model “landing out” at the foot of the hill, as with slope soaring.

Nevertheless, making the best use of flat field thermals is not particularly easy, and calls for considerable skill and experience. Areas of rising air are harder to detect and recognise at a flat field, because they tend to occur at higher altitude than at the hillside, where it is often possible to find lift while the model is cruising along the edge of the slope and then circle away in it. A thermal at a flat field which occurs directly overhead is very hard to recognise, and exploiting it to the full requires a highly skilled pilot. For this reason it is always best to go thermal seeking off to one side of where you are standing.

You will recognise thermal contact by the model’s behaviour. Good thermals are obvious because the model will climb strongly, but it takes a practised eye to detect weak thermals, and you will need a lot of skill to make use of them. With a little practice you will be able to recognise likely trigger points for thermals in the local landscape. The ground warms up in the sun’s heat, but heat absorption varies according to the type of terrain and the angle of the sun’s rays. The air over the warmer ground becomes warmer in turn, and the mass of warm air flows along close to the ground, driven by any breeze. Strong winds usually prevent thermal build-up. Any obstruction - a shrub or tree, a fence, the edge of a wood, a hill, a passing car, even your own model on the landing approach - may cause this warm air to leave the ground and rise. Imagine a drop of water on the ceiling, wandering around aimlessly, and initially remaining stuck to the ceiling. If it strikes an obstruction it will fall on your head. A triggered thermal can be imagined as the opposite of the drop of water.

The most obvious thermal triggers include sharply defined snow fields on mountain slopes. The air above the snow field is cooled, and flows downhill; at the edge of the snow field, part-

way down the valley, the cool air meets warm air flowing gently uphill, and pushes it up and away as if cut off by a knife. The result is an extremely powerful but bumpy thermal bubble. The pilot's task is to locate the rising warm air and centre your model in it. You will need to control the glider constantly to keep it centred, as you can expect the most rapid climb rate in the core of the thermal. Once again, this technique does demand some skill.

To avoid losing sight of the model be sure to leave the thermal in good time. Bear in mind that the aircraft is always easier to see under a cloud than against a clear blue sky. If you have to lose height in a hurry, do bear the following in mind:

The structural strength of the **Alpina 3001 ELEKTRO** is very great, but it is not infinite. **Speed flying** in F3B style is **only** permissible with the flaps set to neutral. If you wish to expand the model's speed range and potential applications, we recommend applying a GRP skin to the flying surfaces.

Set up your landing approach with plenty of height in hand, and deploy the braking system to achieve a steep final approach so that the model is close to the ground for the minimum period of time. The "regulation" square approach, consisting of downwind leg away from you, cross-wind leg and a straight approach with butterfly / crow system extended and final flare will help preserve the model, the pilot and any spectators.

Flying at the slope

Ridge soaring is an extremely attractive form of model flying. Flying for hours on end in slope lift, without needing any outside aid for launching, must be one of the finest of modelling experiences. But to "milk" a thermal to the limits of vision, bring it down again in a continuous series of aerobatic manoeuvres, and then to repeat the whole show - that must surely be the last word in model flying.

But take care - there are dangers for your model lurking at the slope. Firstly, in most cases landing is much more difficult than at a flat field site. It is usually necessary to land in the lee of the hill where the air is turbulent; this calls for concentration and a high-speed approach with last-minute airbrake extension. A landing on the slope face, i.e. right in the slope lift, is even more difficult. Here the trick is to approach slightly downwind, up the slope, and flare at exactly the right moment, just before touch-down.

A further danger is failure of the slope lift or thermal when the model is in a difficult position, resulting in a risky landing in the valley, but there are ways of reducing that risk. Study the valley floor before you launch, and seek out a possible landing site there. Walk down and study the site so that you know where any landing approach obstructions are, and whether the "local" wind is as you would expect it. If an out-landing is unavoidable it is best to land just as at a flat field site with a standard approach and a short, straight final leg with brakes deployed. Keep the model in your line of sight at all times over the planned landing site, as this avoids the danger of an uncontrolled landing. Follow these hints and you will safely reach the site. If the sun is shining you will be able to judge the model's height by the distance between the model and its own shadow, and this will allow you to land with considerable accuracy "way down there".

Never give up; thermals can be found very low down. However, once you have initiated the landing approach do continue and make a landing, as you are unlikely to find real lift that low. With luck you will manage a soft landing. Now take your time to note the landing position and

the best route to it. Look around for landmarks in the countryside which will help you locate the model when searching.

However, the main point to remember when scratching for a thermal below launch height is - “don't panic”: remember that in almost every case it is the pilot that is the problem, rather than the model. If you have a flying colleague who tries to help by giving a continuous commentary and giving what he thinks is useful advice all the time, tell him to shut up. A colleague who wishes to help you will restrict himself to very short and really helpful comments, e.g. by pointing out other models whose pilots have found a thermal, a circling bird of prey or a safe approach to the planned landing site. A really good friend will even launch his own model, fly down into the valley and help you find a thermal. With two models the chances of success are much higher.

Safety

Safety is the First Commandment when flying any model aircraft. Third party insurance should be considered a basic essential. If you join a model club suitable cover will usually be available through the organisation. It is your personal responsibility to ensure that your insurance is adequate. Make it your job to keep your models and your radio control system in perfect order at all times. Check the correct charging procedure for the NC batteries used in your RC set. Make use of all sensible safety systems and precautions which are advised for your system. Gather as much information as you can from various product catalogues, and from your local model shop proprietor.
Always fly with a responsible attitude. You may think that flying low over other people’s heads is proof of your piloting skill, but others know better: the real expert does not need to prove himself in such childish ways. Let other pilots know that this is what you think too. Always fly in such a way that you avoid endangering yourself or others. Bear in mind that even the best RC system in the world is subject to outside interference. No matter how many years of accident-free flying you have under your belt, you have no idea what will happen in the next minute.

The fascination of it all

Model flying is, and always has been, a fascinating hobby. Take your time to get to know your new **Alpina 3001 ELEKTRO** really well. Plan to spend many hours in the open air, where you will learn to appreciate the model’s outstanding performance, its docile handling and its wide-ranging potential.
You can join us in savouring one of the few types of sport which combine high technology, manual dexterity, and sophisticated personal skills. You can fly alone or with friends, and at the same time you can enjoy the pleasures of nature - treats which have become rare in today's world.

We - the GRAUPNER / TANGENT Modellsport team - wish you many hours of pleasure in building and flying your new model. Happy landings!

GRAUPNER / TANGENT Modellsport

Dieter Bär – Model Development

Appendix - Parts List

No. off	Description	Application	Material	Dimensions
1	Building instructions			DIN A4
1	Epoxy fuselage		White GRP	Ready made
1	Canopy		GRP	Ready made
1	Wing set		Foam / obechi	Ready made
1	Tailplane		Foam / balsa	Ready made
1	Rudder		Balsa	Ready made
1	Wire / rod set		Metal / plastic	Parts List
1	Wooden parts set		Wood	Parts List
1	Accessory set		Various	Parts List
1	Servo-lock set		Plastic / wood	Parts List
1	Wing joiner		CFRP	20 x 12 x 227
Wire / rod set				
2*	Steel rod / pushrods.	Tailplane / rudder	Spring steel	1.4 Ø x 1200
1	Steel rod	Tow-release	Spring steel	1.4 Ø x 160
1	Snake sleeve	Tow-release	Plastic	3.2 Ø x 350
1	Rudder pivot rod		CFRP	2.0 Ø x 420
* for tailplane; already installed in the fuselage				
Wooden parts set				
1	Servo plate	Fuselage fitting	Plywood	210 x 85 x 3 mm
1	Motor bulkhead	Fuselage fitting	Plywood	
1	Battery support	Fuselage fitting	Plywood	
1	Compression strut	Fuselage fitting	Plywood	75 x 10 x 10 mm
1	Catapult hook support	Fuselage fitting	Hardwood	50 x 15 x 15 mm
Accessories				
3	Threaded coupler	Control surface linkage	Steel	M2
7	Clevis	Control surface linkage	Steel	M2
4	Threaded rod	Control surface linkage	Steel	M2
2	Aileron horn	Control surface linkage	GRP	Machined
2	Flap horn	Control surface linkage	GRP	Machined
1	Rudder horn	Control surface linkage	Aluminium	M4 / 1.6
2	Ring-screw	Rudder hinge lug	Aluminium	M4 / 2.05
6	Locknut	Control surface linkage	Plated brass	M2
2	Peg (Multilock)	Wing retainer	Plastic	
1	Tailplane joiner	Tailplane / fuselage	Steel	3 Ø x 130
1	Tailplane joiner	Tailplane / fuselage	Steel	3 Ø x 100
4	Incidence peg	Wing	Steel	3 Ø x 60
1	Towhook	Fuselage	Steel	Ready made
1	Self-tapping screw	Fuselage	Steel	M4 x 25
1	SPAX screw	Fuselage	Steel	3 Ø x 16

Contents and materials may differ.

Be sure to read right through the instructions covering assembly and operation of your model before you attempt to operate it for the first time. You alone are responsible for the safe operation of your radio-controlled model. Young people should only be permitted to build and fly this model under the instruction and supervision of an adult who is aware of the hazards involved in this activity.
If you have questions regarding the safe operation of your RC model aircraft, please turn to your local model shop in the first instance, as the staff will be pleased to help you.

Radio-controlled model aircraft are very demanding and potentially dangerous machines, and call for a high level of technical knowledge and skill from the operator, together with a responsible attitude.

In legal terms our models are classed as aircraft, and as such are subject to statutory regulations and restrictions which must be observed. Our brochure "Modellflugrecht, Paragrafen und mehr" (Model Aviation Law, Legal Requirements and more) is available under Order No. 8034.02, and contains a summary of all these rules; your local model shop should have a copy which you can read. There are also Post Office regulations concerning your radio control system, and these must be observed. Refer to your RC system instructions for more details.

It is important to use only those parts included in the kit, together with other genuine Graupner accessories and replacement parts as recommended expressly by us. Even if you change a single component, you can no longer be sure that the whole system will work reliably, and such changes also invalidate your guarantee.
Use only matching polarised connectors.
Avoid short circuits and reverse polarity at all times.
The high energy density of NiMH batteries involves a permanent risk of fire and even explosion.

A radio-controlled model aircraft can only work properly and fulfil your expectations if it is built very carefully and in accordance with the building instructions. If you wish to avoid injuring people and damaging property, it is essential to be careful and painstaking at all stages of building and operating your model. Nobody would climb into a full-size sailplane and try to fly it without completing a course of training first. Model flying is just such a skill, and has to be learned in exactly the same way.
However, as manufacturers we have no means of influencing the way you build and operate your RC model aircraft, and for this reason we can do no more than point out the hazards expressly. We accept no further liability.

If you need help, please enlist the aid of an experienced modeller, join a model club or enrol at a model flying training school. Model shops and the specialist

model press are also good sources of information. The best course is always to join a club and fly at the approved model flying site.

Adhesives and paints contain solvents which may be hazardous to health under certain circumstances. Read and observe the notes and warnings supplied by the manufacturer of these materials.

The operator of the model must be in full possession of his or her bodily and mental faculties. As with car driving, flying a model aircraft under the influence of alcohol or drugs is highly dangerous and not permissible under any circumstances.

Make sure that all passers-by and onlookers are aware of the hazards involved in the operation of your model.

Keep a safe distance between your model and other people or objects. Never fly low over people or directly towards them.

Radio-controlled models should only be flown in "normal" weather conditions, i.e. a temperature range of -5° to +35°C. More extreme temperatures can lead to changes in battery capacity, material characteristics, the strength of glued joints and other unwanted effects.

All model flyers should behave in a way which minimises the danger to people and property. Never act in any manner which will disturb other pilots, or have an adverse effect on safe, orderly flying at the site.

Don't operate your model in the vicinity of overhead high-tension cables, industrial sites, residential areas, public roads, squares, school playgrounds, public parks or sports fields etc.

Don't disregard our warnings. They refer to hazardous materials and processes which, if ignored, can result in fatal injury or serious property damage.

Every time you intend to fly the model, check carefully that all parts connected to it are working correctly, including RC components, control surface horns etc. Everything must be properly located and firmly secured. Check for possible damage, and do not fly your model unless you are confident that everything is in perfect order.

Whenever you are holding the model, make sure that you are standing on a safe surface and cannot slip. Wear high-grip shoes, such as trainers.

Satisfy yourself that your frequency is vacant before you switch on. Radio interference caused by unknown sources can occur at any time without warning. If this should happen, your model will be uncontrollable and

completely unpredictable. Never leave your radio control system unguarded, as other people might pick it up and try to use it.

If you are to fly your model safely and avoid problems, it is essential that you are aware of its position and attitude throughout each flight - so don't let it fly too far away! If you detect a control problem or interference during a flight, immediately land the model to prevent a potential accident. Model aircraft must always give way to full-size aircraft. Take-off and landing strips should be kept free of people and other obstacles.

Your RC system can only work reliably if the batteries are kept fully charged. Never use hot, faulty or damaged batteries. It is important to observe the instructions supplied by the battery manufacturer.

Before every flight ensure that all functions are working correctly, and carry out a range check.
Always switch on the transmitter first, then the receiving system. When switching off, reverse the order: receiving system first, then the transmitter.
Check that the control surfaces work in the correct "sense", i.e. they deflect in the direction which corresponds to the movement of the stick.

After each session remove all the batteries from the model and store them in a discharged state (approx. 0.9 V per cell) at a temperature of about +5° to +25°C. They must be kept out of the reach of children.

Please don't misunderstand the purpose of these notes. We only want to make you aware of the many dangers and hazards which can arise if you lack knowledge and experience, or work carelessly or irresponsibly. Provided that you take reasonable care, model flying is a highly creative, instructive, enjoyable and relaxing pastime.

Notes on the use of NiMH batteries

Application
All Graupner NiMH battery packs and single cells are designed exclusively for typical modelling applications in model aircraft, boats and cars.

Charging
1. NiMH batteries must always be charged using a suitable standard charger or fast charger. For more information see the main Graupner FS catalogue.
2. Before charging an NiMH pack, allow it to cool down to ambient temperature, i.e. approx. 20ºC. If necessary, use a BATTERY COOLER, Order No. 2882, to speed up the process.
3. The battery should not be charged until just before use, as all NiMH cells have a natural tendency to self-discharge due to their construction.
4. **Warning**:

The charge process must be supervised even if you are using a fully automatic charger. Note the maximum permissible charge current printed on the pack or individual cells, and do not exceed that value. Excessive charge currents can cause NiMH cells to overheat. If the battery heats up to about 50°C when on charge, the charge current must be switched off immediately. When NiMH cells get hot, the pressure inside the cell case rises greatly. Every NiMH cell in a pack is fitted with a pressure valve which is designed to prevent it exploding dangerously in an emergency. However, the valves may be blocked or malfunction for some other reason, which means that an explosion is always possible if the cell overheats seriously.

5. **Warning**:
   If you accidentally overcharge an NiMH pack, do not touch it! Switch off the charge current and allow the pack to cool down naturally.
6. **Warning**:
   It is essential to avoid short-circuits involving NiMH packs. The result is an extremely high rate of discharge which heats up the battery immediately, and this can cause cells to burst in the same way as an overheated pack. The explosion itself represents a serious risk of injury, and any corrosive electrolyte which escapes from the cell can cause chemical burns.
   If electrolyte escapes from a cell, take great care to avoid it getting on your skin or in your eyes. If this should happen, rinse immediately with copious quantities of water and seek medical assistance.
7. Never solder a wire or anything else directly to the cell case, as this may damage the pressure valve.
8. **Warning**:
   Never dispose of faulty or exhausted NiMH batteries in a fire, as they may explode. Don't discard them in the household rubbish, as they constitute toxic waste and require special treatment. Take them to your local toxic waste collection point (ask your local council for details). It costs nothing to dispose of exhausted cells properly, and helps preserve a clean environment, as most of the materials can be recycled.

Notes on building and flying the ALPINA 3001 Champ ELEKTRO
Before you start construction:

RC system components and the control surface linkages must be installed at the appropriate stage of construction, as it may be very difficult or even impossible to fit them later.

When you are buying a radio control system it is important to ensure that the transmitter and receiving system are designed for use with **model aircraft**, and are approved by your national Post Office approvals authority. All RC units should possess an FTZ series approval number.

Please remember that other radio systems and radio-frequency apparatus are also permitted to operate in the frequency ranges used by model radio control equipment, and there is no guarantee that your system will not suffer interference caused by such apparatus.

If you are not sure whether this applies to you, contact your nearest Post Office Telecommunications office. Your local model shop will also have this information.