

Instructions



JODEL ROBIN DR 400/180

For internal combustion motors up to 58 cm³

Requires a HoTT radio control system with 5 functions

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Specification

Wingspan about	2500 mm
Fuselage length without spinner about	1910 mm
Wing area about	98 dm ²
Tailplane area about	10 dm ²
Total surface area about	108 dm ²
All-up weight depending on equipment about	11000 g
EWD	0-0.5 degree
Centre of gravity	about 140 -150 mm behind the leading edge

Caution: This model is not a toy!

If you do not have experience with such motorised models, please ask experienced model flyers for help. If the model is operated without the proper knowledge, injuries can result. Think of your health and safety!

Important! Before you start the assembly!

Even if you have already built lots of RC models, read these instructions through carefully and check the parts in the kit for completeness. A lot of effort was made to keep things as simple as possible without neglecting safety.

Note on the covering sheet

Because of strong changes in the weather (temperature, humidity, et cetera), small creases can appear in the covering sheet. In rare cases, the components can even be warped. This lies in the nature of wood construction with covering sheet. This can be corrected as follows using a hair dryer like those available to model builders.

Creases: Blow hot air over the area and rub with a soft cloth.

Warped area: Gently twist the area against the direction of warping and smooth it out again using hot air.

Caution! Never use more heat than is absolutely necessary. If the iron is too hot, the covering sheet will melt and holes will form.

The extensively pre-fabricated model can be built in a very short time. However, the remaining steps are important and have to be carried out with care. Doing this work properly determines whether the model will have the prescribed rigidity and flight characteristics; so please work slowly and precisely!

When putting screws into wood, apply a little casein glue to keep them from loosening: Squirt casein glue into the drill hole and screw in the screw.

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Tips on building the model

- Before assembling the model, it is essential to read the construction diagram and the instructions all the way through. When using tools, be aware of the possible dangers.
- Use only suitable cables that are adequate for the electrical currents that occur during operation.
- Set up the receiver aerial as far as possible away from the cables carrying the operating current (at least 3 cm).
- Clean residual grease from all connections that are to be glued. This could be done, for example, through sanding and using a non-relubricating cleaning solution. The same goes for the surfaces to be painted, in order to make sure that the paint sticks. Before gluing parts, always roughen the corresponding surfaces (especially for GFR fuselages) carefully with fine sandpaper and de-grease them thoroughly, for example with acetone. Otherwise, adequate adhesion is not assured.

Other required accessories

Internal combustion motor and accessories

Motor Order No.	Capacity cm ³	Silencer Order No.	Exhaust manifold Order No.	Propeller Order No.	Teflon hose Order No.	Spring clamps Order No.
OS GT 55 2760	55	2760.34	2760.51	56x25 cm 2960.56.25	6861.25	6865 2 required

Radio control system

It must have at least 5 control functions and 10 servos. Furthermore, the transmitter must be capable of reversing the direction of servo rotation.

Particularly recommended: Computer systems MC-22s to MC-24. Servos with standard dimensions can be installed.

As receiver battery, we recommend: two GRAUPNER 5N-5000 NiMH Order No. 98903.5, which must always be serviced well before and after flight operations, meaning that the battery has to be charged and discharged again multiple times until the specified capacity has been reached.



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Connecting the two ailerons and the landing flap servos to the receiver requires four spark suppression filters, Order No. 1040 or one folding ferrite ring, Order No. 98516.1 with four extension cables Order No. 3935.32.

The two aileron servo cables must each be extended with an extension cable Order No. 3935.65; the two landing flap servo cables with Order No. 3935.11; the two elevator servos with Order No. 3935.105. For the servos for throttle coupling, nose landing gear, aero-tow coupling, et cetera, seven extension cables Order No. 3935.32 are needed. Connecting the telemetry sensors requires one cable Order No. 33700.2.

Two Order No. 7907.2 are used as servo control arms.

Receiver and battery: Store in foam material.

Any servo of standard size and an adjusting power of about 50 Ncm can be installed.

Adhesives

Epoxy glue, such as "UHU plus schnellfest," Order No. 962

Epoxy glue, such as "UHU plus endfest 300," Order No. 950.43

"UHU Holzleim express" casein glue, Order No. 958.60

"UHU hart" glue, Order No. 534.35

Fast-setting (cyano-acrylate) glue, such as Order No. 5821

Fast-setting glue, such as Order No. 5821

Thread lock fluid, such as Order No. 952

Heat-shrink tubing, Order No. 3391.8

Accessories for operation (not included)

Fuel, depending on the motor petrol/oil mixture (see instructions for the motor used)

Fuel tubing, petrol, such as Order No. 1325.2

Manual fuel pump, such as Order No. 6870

Ignition battery, Order No. 8716.5

OS Super-Filter Order No. 1646.1

Required tools (not included)

Various (Philips) screwdrivers, needle-nose pliers, flat-nose pliers, wire cutter, balsa knife or razor blade, various drills, pencil, felt marker, soldering iron with fine tip.

Assembling the JODEL ROBIN DR 400/180

Wings with undercarriage and tailplane

Do not begin the assembly until you have familiarised yourself with the components and the individual construction stages. If you are not satisfied with any component, report it to your retailer before you start the construction process.

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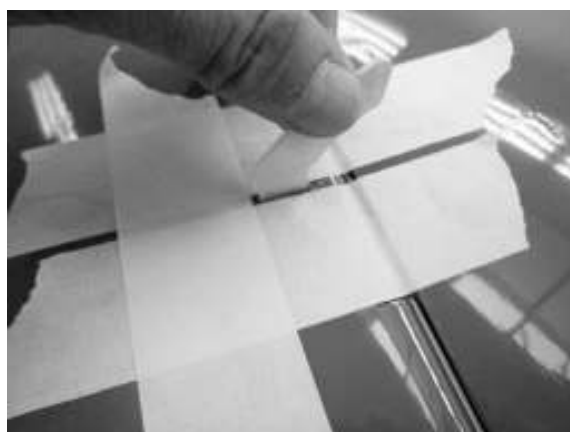
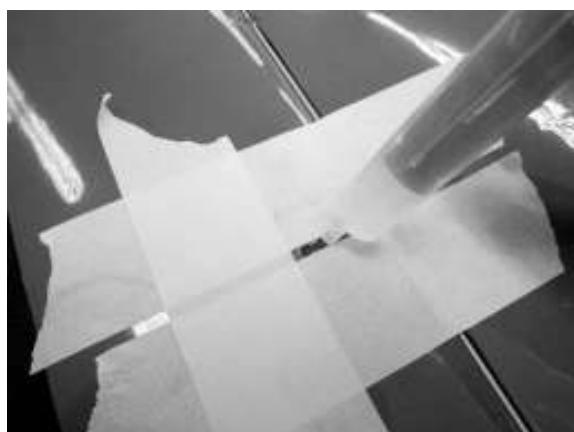
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Using sandpaper or sanding block, sand the control horns on the surfaces to be glued in order to achieve an adequate connection when gluing.



As seen in the photos, remove the covering from the slots for the GRP control horns, put a dab of glue into the slot, and push the control horn in until it stops.



Wipe off any excess glue.



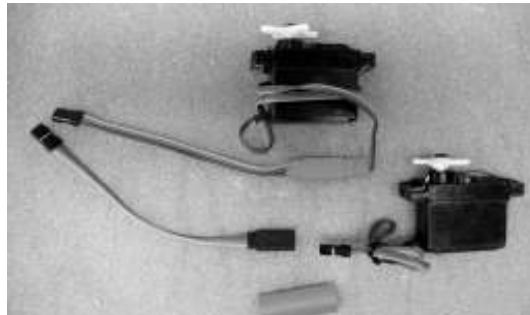
Until the glue hardens, the servos are installed in the corresponding mounts and fastened into the wing or tailplane.

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Extend the servo cables using the corresponding extension cable and make sure they can not come loose, for example with a piece of heat-shrink tubing or a drop of fast-setting glue. Using the RC system, bring the servos into centre position and install the servo levers.



Fasten the servo to the attachment block using the screws included with the servos. To do so, insert the rubber grommets with the brass hollow rivets, collar downward, into the servo flange. For drilling Ø 1.5 mm holes for the screws, the hollow rivets can be used as a drilling template. To make it easier to push them in, the hollow rivets can be placed onto a screwdriver of the proper size.



Now the servo cables are pulled into the wing halves and tailplane halves using a thread. Just behind the connector, tie the thread to the cable and pull it in so that it comes out the wing root.

With servo and rudder in neutral position, screw together the lengths of the rods for the ailerons, landing flaps, and elevators, adjust them; then use thread lock fluid (such as UHU schraubensicher) and lock nuts to secure them against loosening.

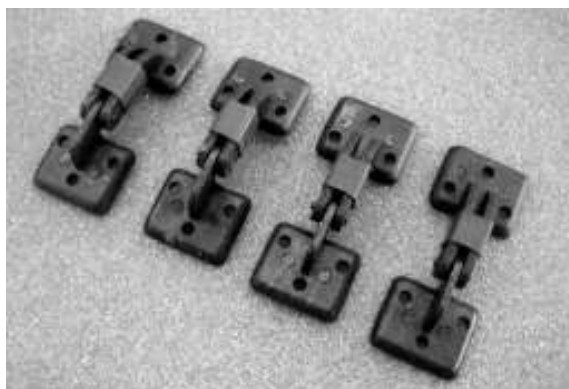
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As shown in the photo, secure the hinges for the landing flaps using heat-shrink tubing.



On the underside of the wings, there are markings indicating where the flap hinges can be screwed in. Make sure that the axes of rotation of the hinges are all the same distance from the trailing edge of the wing.

As shown in the photo at the left, use one screw to



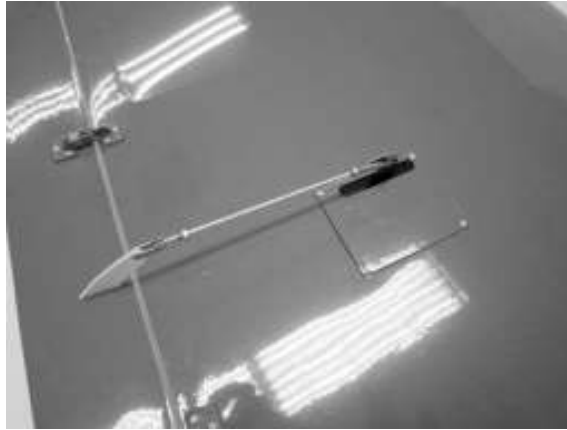
fix the hinges in place; then use an engineer's square or geometric protractor for alignment with the trailing edge, and fasten the hinges with two more screws. Now push the landing flaps up against the wings and tape them in place temporarily; align them, and fasten them with screws.

Screw the pushrods together as shown in the following photos.

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In the next step, use your fingers to feel for the slot for the landing gear wire, and melt it free with a hot soldering iron.



Now place the leg of the undercarriage into the slot to mark the attachment points of the two tabs and the wheel fairing support block.

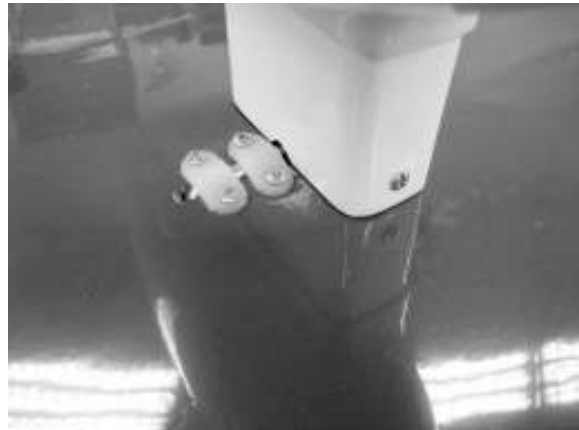


Drill pilot-holes in the wings for the retaining screws; then screw the tabs and the wheel fairing support block to the wing.

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For the wire undercarriage units you will need to file away the inside of the two fairings a bit. When installing the fairings, make sure that the wheel covers face outwards. The wheels can now be attached to the axles using collets and grubscrews. Apply UHU thread-lock fluid to the grubscrews to prevent them working loose. Loosen the grubscrew at the front of the shock absorbing strut, loosen, and push the wheel axle to the other side. Re-tighten the grubscrew.



The wheels and wheel fairings must be aligned exactly parallel with the fuselage centreline.

The final work on the wing is to install the landing searchlight. As shown in the following photographs, fit the two LEDs in the white plastic holder and secure them with a little UHU Power all-purpose adhesive.

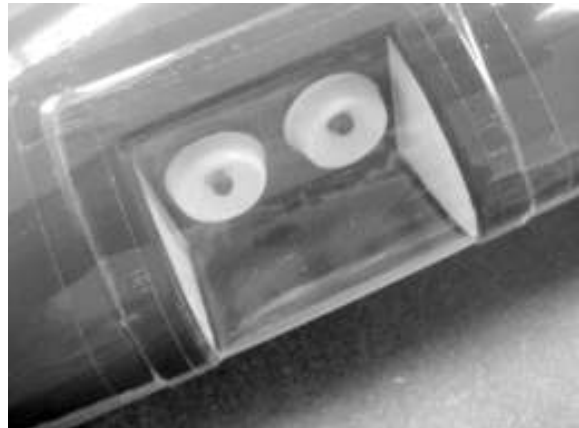
Trim the outside edges of the plastic holder so that it fits in the recess in the wing. Route the connecting leads of the two diodes to the root rib using a piece of thread, and run them out of the drilled access hole. The plastic holder can now be glued in.

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using UHU Power all-purpose adhesive. Fix the glazing to the wing using clear adhesive tape.



Fuselage with tailplane, vertical stabiliser, and nose gear

The vertical stabiliser can either be glued permanently to the fuselage or fastened removably using four screws.

Only the fastening of the vertical stabiliser using screws is described.

Before putting in the screws, the two extension cables for the two elevator servos must be pulled into the fuselage.



Use the Ø 12 mm aluminium tube to put the horizontal stabiliser onto the fuselage to test the fit; the two extension cables must be routed through the openings of the horizontal stabiliser on the right and left.



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The two halves of the tailplane must be attached to the fuselage using the Ø 12 mm aluminium tube and four M3x16 Allen screws each.

Now the rudder is fastened to the horizontal stabiliser using steel wire. Assemble the pull cables as shown in the photo.



Then attach the rudder servo to the servo plate at the front of the fuselage.

As shown in the photo, install the pull cables to the servo lever and adjust them so that the rudder is in the centre position when the servo is in the centre position.



As shown in the photo, fix the fairing support block to the nose gear using an M4 Allen screw and nut.



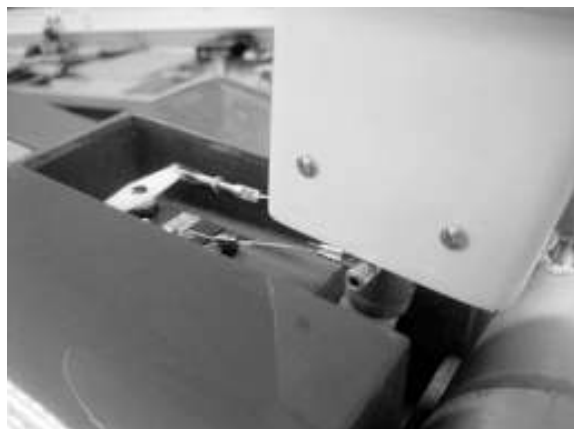
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Fix the nose gear in the brackets by tightening the screw in the collet. Assemble the pull cables as shown in the photo.



Here too, make sure that the nose gear is exactly in the neutral position when the servo is in the centre position. Later the nose gear steering servo and the rudder servo can be connected to the same receiver socket either using a Y-lead or via a mixer at the transmitter.

As shown in the photos, the wheel fairing is attached to the support block using four self-tapping screws.

The nosewheel can now be fitted onto the axle and secured using two collets, as already described for the main undercarriage.

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12

As with the ailerons and landing flaps, each of the rudder pushrods consists of two M3 clevises and nuts and one threaded rod. The length of the two rods must be adjusted so that the elevators are at the centre position when the servo is in centre position. Before screwing in the two elevator servos, the connecting cables must be extended using suitable extension cables.

Screw the aero-tow mechanism into the hole just behind the canopy, and apply UHU thread-lock fluid to prevent the coupling and nut from working loose. The aluminium part must be shortened enough so that the clevis can move freely; adjust the rods accordingly.



It is best to operate the aero-tow release mechanism using a momentary switch mounted on the joystick. The servo travel must be set accordingly.

Installing the tank and motor

Assembling and installing the fuel tank

Slip a piece of plastic tubing (about 160 mm long) onto the fuel tank clunk pick-up. Push the free end of the fuel tubing onto one of the tubes in the fuel tank stopper so that the pick-up will be able to move freely inside the tank later on **without** binding or jamming when the stopper is in place. Use a heat-gun or lighter to gently heat the free plastic tubes so that they can be bent easily. One tube should face down and will be used later to fill the tank; the other one points upward and will serve later as the overflow when the tank is filled. Extend each of the two tubes with a piece of fuel tubing so that they extend to the top and bottom of the tank, respectively.

Now push the tank stopper over the throat of the fuel tank, and tighten the Philips-head screw to fasten the stopper in place. It is important to tighten the screw so that the tank is completely sealed. This can be checked by holding the tank under water. Hold it under water and blow air into it. If the tank is sealed, there will be no air bubbles.

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Connect a further length of fuel tubing to each stub tube projecting from the fuel tank. Mark the silicone tubes with a felt marker to show which of them runs to the motor, the overflow, and the filler.

Once the tank is pre-assembled in this way, it is fastened to the attachment block as shown in the photo.



Push the fuel tank into the fuselage so that the three silicone tubes stick out through the drill hole in the bulkhead.



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The tube from the clunk is then connected to the carburettor, while the overflow is run downward. The fuel filler tube can later be routed out through a drill hole in the motor bonnet. After filling, it should be sealed with a plug. The attachment block is fastened with two screws.

The throttle servo must be installed using the bracket as shown in the photo. Depending on the motor used, the servo is installed to right or left of the tank.

Installing the motor

This section describes the installation of the OS MAX GT 55, but the procedure is the same for other engines.

Four holes for the rubber damping elements have to be drilled into the firewall to match the particular engine.

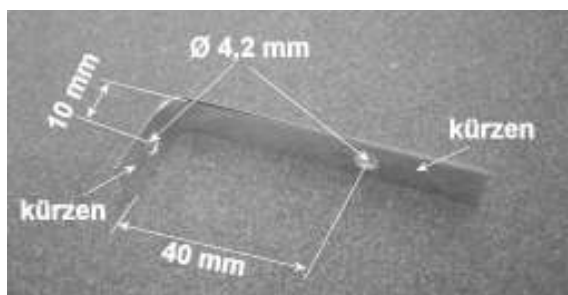
The centre of the motor is marked on the firewall. Drill Ø 10 mm holes to match the attachment holes for the engine.

Now push the rubber dampers into the four holes, and attach the engine using four Allen screws, stud bolts, washers, and nuts. Tighten the Allen screws only to the point that there is still a damping effect.



The throttle rod is adjusted so that the carburettor is half open when the servo is in centre position. The servo travel must be adjusted so that the engine stops when the throttle stick and trim are at the full back position.

The silencer is attached using the brass strips supplied, which are bent and drilled according to the dimensions shown in the photo.



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Attach the silencer to the motor using the manifold, the Teflon hose, and the spring clamps. With these parts in place, the attachment points for the two aluminium brackets can be marked on the fuselage by screwing the two attachment brackets to the silencer; drill the Ø 4.2 mm holes and attach the brackets to the fuselage using M4 Allen bolts and captive nuts.



Now, the silencer aluminium brackets, and, together with the manifold, can be bolted to the engine; a drop of UHU thread-lock fluid should be applied to each bolt and nut to prevent them working loose.



To fit the motor used, it is necessary to cut or file out openings in the engine bonnet for the silencer exhaust pipe, spark plug, et cetera. Position the engine bonnet on the fuselage in such a way that the clearance is about 2 mm between the spinner base plate and the front edge of the bonnet.

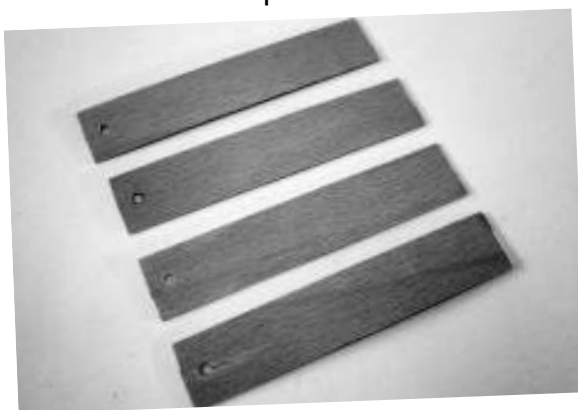
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To attach the engine bonnet to the fuselage, the four attachment points also have to be marked on the engine bonnet. To do so, cut four strips of scrap wood and drill a Ø 3 mm hole in each one as shown in the photo.



Now each strip is fastened to the fuselage using an M3 Allen screw and taped in place as shown in the photo.

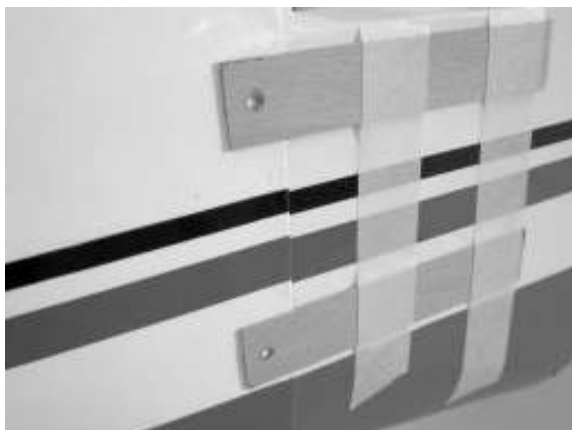


Unscrew the Allen screws, then push up the engine bonnet so that it moves under the strips and the spinner base plate is about 1.5-2 mm from the engine bonnet. In this position, mark the four attachment points on the engine bonnet.

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The engine bonnet is attached with four Allen screws as shown in the photos.



Cockpit canopy

Glue the seat backs and pilot figure in the proper positions as shown in the following photos.

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18



The parts should be affixed using double-sided tape, such as Order No. 2904.



The cockpit canopy is attached to the frame using small pan-head self-tapping screws. A strip of tape all around has proven to be a good way to ensure that the cockpit canopy fits the frame uniformly.

The final work on the model consists of fitting and gluing the navigation lights, hatch covers, and aerials and affixing the decals and lettering.



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19

Balancing the Jodel ROBIN DR 400/180

The completely equipped model, with the fuel tank empty, should balance level when supported at a point about 140 - 150 mm aft of the leading edge of the wing, ideally in inverted flight position. If the centre of gravity is correct, the model should balance out horizontally or with the nose pointing slightly downward. If necessary, adjust the centre of gravity by shifting the position of the receiver batteries or screwing on trim weights. Before flying the aircraft, set the transmitter trims to centre and ensure that all the control surfaces are also exactly centred (in neutral position).

Rudder deflection for normal flying

Ailerons	30 mm up and 10 mm down
Elevators	25 mm up and down
Rudder	45 mm left and right
Landing flaps	Take-off 15 mm down
	Landing 60 mm down

We recommend that you set exponential values of 30% at the transmitter.

Assembling the Jodel Robin 400/180

Attach the two halves of the tailplane to the fuselage using the aluminium tube. Connect the servo cables to the extension cables coming from the fuselage; secure with Order No. 3506. Push the halves of the tailplane all the way onto the fuselage and fasten each with four Allen screws.

Use the aluminium tubes to place the wing halves onto the fuselage. Stick the servo connector cable together with the extension cable from the receiver and secure with Order No. 35060. Slide the wing halves completely onto the fuselage and connect each to the fuselage using two plastic screws. Only tighten the screws enough to bring the two wing halves together with the root rib.

Important:

When assembling the rods, always take care to ensure that they move freely and can move through their entire controllable path - including trim travel - and are not mechanically impeded.

When the joystick moves to the right, the rudder and nose gear must turn to the right (left stick/left rudder). When the elevator stick is pulled back, toward your stomach, the elevators must deflect upward (stick forward = elevators down). If the aileron stick is moved to the right, the right aileron should move upward; the left aileron downward. When the throttle stick is pushed forward, the motor must run at full power; if the throttle stick and trim are moved back to their end-points, the engine must stop. If the trim travel is moved all the way back, the motor must stop. The landing flaps are best activated via a three-position switch.

All that remains is to wish you many hours of happy flying your JODEL ROBIN DR 400/180.

Your **Graupner** Team !

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Safety notes and warnings

Regarding motorized aircraft models with internal combustion engines

- Before you first attempt to fly the model, it is essential to carefully read all the operating and assembly instructions.
- These safety notes are part of these instructions and must be stored carefully with the operating instructions and, if the model is passed on to others, they must also be passed on to the next user.
- Motorised models are very demanding and dangerous objects and require that the user have great expertise, skill, and a sense of responsibility.
- Motorised models are not suitable for persons under 18 years of age.
- They may be operated only under the instruction and supervision of an adult who is familiar with the attendant hazards.
- The operator of the model must be in full possession of his or her bodily and mental faculties. As with car driving, operating a model aircraft under the influence of alcohol or drugs is not permissible under any circumstances.
- Radio controlled aircraft models may be used only for the purpose intended by the manufacturer; meaning not as a sporting device designed to carry people. Any other use is forbidden.
- A model can only work properly and fulfil your expectations if it is built or assembled with the greatest of care and in accordance with the assembly instructions. Independent changes in design or materials are not permitted. To avoid injuring people and damaging property, it is essential to be careful and thoughtful when operating your model. Nobody would climb into a full-size glider and attempt to fly it without undergoing training beforehand. Model flying is also something that has to be learned! We suggest that you ask an experienced model flyer for help, or join a model club or model flight training school. Your local model shop and the specialist magazines are excellent sources of information.
- Always observe the information on the centre of gravity and on control surface deflection! The model must be adjusted accordingly.
- Radio control system: Make sure the frequency used is vacant. Do not switch on until you are sure! Check the RC system frequently; it too is subject to wear. Radio interference caused by unknown sources can occur at any time without warning. Your model will then be uncontrollable and completely unpredictable. Never leave your radio control system unattended, as another person might pick it up and try to use it. To ensure proper operation of your RC system, make sure that the batteries are kept fully charged.
- Do not ignore warnings! They refer to materials and situations, which, if ignored, can - in extreme cases - result in fatal injury or permanent damage.
- You alone are responsible for the safe operation of your model and motor.
- Questions regarding the safe operation of model and motor can be answered by your retailer.
- Propellers and other rotating parts that are powered by a motor pose a constant risk of injury. Do not touch them with any part of your body! For example, a propeller spinning at high speed cut off a finger!

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- Always keep well clear of the rotational plane of the propeller! You never know when some part may come loose and fly off at high speed and with great energy, hitting you or a third party. Make sure that no other object can come into contact with the rotating propeller.
- Be careful with loose clothing, such as scarves, loose shirts, et cetera: They can be sucked in by the propeller stream and get in the way of the propeller itself.
- If there are passers-by or spectators at your flying site, make sure that they are aware of the dangers inherent in your activity before you start the motor, and insist that they keep a safe distance away (at least 5 m).
- Model aircraft may be flown only at "normal" outside temperatures, meaning in a range of - 5° C to + 35° C; more extreme temperatures could lead to changes, such as battery capacity and material characteristics, et cetera.
- Model fuel is poisonous! Do not let it come into contact with eyes or mouth! Store only in clearly marked containers out of the reach of children.
- Never run the motor in closed rooms, such as basement, garage, et cetera. Model motors also produce deadly carbon monoxide gas.
- Operate only outdoors!
- Adhesives and paints contain materials which may be hazardous to health under certain circumstances. You should therefore observe the notes and warnings supplied by the manufacturers of these materials.
- Model fuel is highly flammable and combustible; keep away from open flames, excessive heat, and any sources of sparks or other things that could lead to ignition. Do not smoke in the direct vicinity of fuel or fuel fumes.
- During operation, a model motor develops a great deal of heat. Motor and shock absorbers are therefore very hot during operations and for a while afterwards. Touching them can result in serious burns. Careful when making adjustments! Wear protective gloves! In extreme cases, even fires can be caused.
- While operating the motor, not only poisonous and hot exhaust emanates from the exhaust pipe but also very hot liquid combustion residue, which can result in burns.
- After operation, remove residual fuel from the tank and motor.
- Before and after you operate your model, always carefully check it and everything attached to it (such as propeller, rudder linkages, rudders, et cetera) for possible damage. If you find a fault, do not fly the model until you have corrected it.
- The motor is started with an electric starter, which may be equipped with an adapter that fits the model. As an alternative start aid for fixed-wing models, a wooden dowel with a piece of watering hose attached can be used, for example.
- During operation, model motors may develop noise far greater than 85 dB (A); always wear protection for your ears. Never start motors without a silencer. However, even with a silencer, model motors can disturb neighbours. Do not run motors when people expect peace and quiet.

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- If the propeller is turning while the model is standing on sandy ground, for instance, the propeller can suck up sand and dust and hurl it around, and it could get in people's eyes. Wear protective goggles!
- Take care that the spark plug clip and the lead can not get tangled in the turning propeller or other rotating parts. Check the throttle linkage, too.
- Take particular care when carrying the model with the engine running. Hold the rotating parts well away from you!
- Always keep an adequate supply of fuel in the tank. Never continue to fly the model until all the fuel is used up.
- Never fly directly over people.
- Never fly directly towards people.
- Make sure to keep a safe distance from residential areas: at least 1.5 km "as the crow flies". It is always best to join a club and fly at the approved model flying site. Always keep well clear of high-tension overhead cables.
- Whenever working on the engine, make sure that you have secure footing, and always hold the model securely.
- When starting and landing, the take-off and landing strips should be kept free of unauthorised people and movable obstacles.
- The model aircraft must be kept constantly in sight during the entire flight. It must always give way to manned aircraft.
- Never operate your aircraft from public roads, squares, squares, school playgrounds, parks, or sports grounds, et cetera, and ensure that you are always in full control of the model.
- To ensure that you can stop your engine at any time, the throttle must be adjusted so that the carburettor barrel closes completely when the throttle stick and trim are moved to their end points. If this does not work, pinch the fuel line between your fingers or pull off the connecting tube to the tank. Never try to stop the engine by grasping the flywheel, propeller, or spinner!
- All model fliers should take care to ensure that the public safety, especially that of people and property, as well as orderly flying operations, are not endangered or disturbed.
- In legal terms, model aircraft are classed as aircraft and as such are subject to legal regulations and restrictions that must be observed.
- Our brochure "Modellflugrecht, Paragraphen und mehr" (Model Aviation Law, Legal Requirements and more), Order No. 8034.02 contains a summary of all these rules, and your local model shop should also have a copy which you can read. Models powered by internal combustion engines may only be flown with the landowner's permission, and insurance is mandatory. There are also regulations concerning your radio control system that must be observed.
- These notes are intended only to make you aware of the many dangers and hazards that can arise if you work carelessly or irresponsibly. If you take reasonable care, model flying is a highly creative, instructive, and relaxing pastime.
- The extensively pre-fabricated model can be built in a very short time. However, the remaining steps are important and have to be carried out with care. Doing this work properly determines whether the model will have the

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11/2011

prescribed rigidity and flight characteristics; so please work slowly and precisely!

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Important safety notes

You have acquired a kit that can be assembled into a fully working RC model when fitted out with suitable accessories. However, GRAUPNER has no control over whether you observe the instructions for the installation and operation of the model or for the use and maintenance of the associated components. For this reason GRAUPNER assumes no liability for loss, damage, or costs, which are incurred due to the incorrect use of our products or due to improper behaviour on the part of the user, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of GRAUPNER to pay compensation for any reason whatsoever (including personal injury, death, damage to buildings, damage due to loss of business or turnover, interruption of business, or other direct or indirect consequent damage) stemming from the operation of the model is excluded.

The total liability in all cases and under all circumstances is limited to the amount of money that you actually paid for this model.

This model is started up and operated at the sole and exclusive risk of the operator. To avoid injuring people and damaging property, it is essential to be careful and thoughtful when operating your model.

According to the new regulation of §103 Paragraph 3 of the LuftVZO (German Aviation Approvals Office), **all** model aircraft - whether slow flyer, park flyer, glider, or model aircraft propelled by any form of power plant - must be insured before the model is operated. Therefore, you should purchase special RC model liability insurance. Your local model shop will be glad to advise you.

These safety notes must be kept in a safe place, and, if you ever sell the model, must be passed on to the buyer.

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 make claims under 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 further claims, especially for reimbursement of costs relating to the defect (such as installation / removal costs)

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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 (such as invoice, receipt, delivery note) and this guarantee card. The defective goods must be sent to us at the purchaser's 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 whether 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 that is submitted properly within the claim period, all claims based on this declaration expire after six months from the time of claim, but not 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 applicable German Law, without the norms of international private law, and excluding UN retail law.

The following items must be observed:

- Before you fly the model, check that the radio control system is working reliably, and that all connections are secure.
- If you intend to use dry cells as a power supply, please note that they must never be recharged. Only rechargeable batteries can be re-charged.

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- The batteries must be charged, and the range of the radio control system must have been checked. In particular, the transmitter and receiver batteries must be charged before each take-off.
- Ensure that the channel you intend to use is not already in use. Never fly the model if you are not certain that your channel is free.
- Observe the instructions and information regarding your radio control system and accessories.
- 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 before transporting and storing the model.
- Do not subject the model to intense humidity, heat, cold, or to dirt.
- Protect the model and RC equipment against damage during transport.

Pre-flight check

Check for correct functioning and range before every flight. To do so, screw in the transmitter aerial and extend it fully. Then switch on the transmitter, followed by the receiver. At an appropriate distance, make sure that all the control surfaces are working properly and deflecting in the correct direction.

Repeat the check with the motor running, while someone holds the model securely for you.

The first time you control a model aircraft, it is best to ask an experienced person to help you with the pre-flight check and during the first few flights.

Care and maintenance

- Clean the model carefully after every flight. Also remove any dirt from the propeller. Clean the model and the RC components using suitable cleaning agents only. Ask your model shop for information.
- If the model is not to be operated for a considerable time, all the moving parts must be cleaned and re-lubricated.

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