



aero naut

Outboard Hydroplane

RX-3

Order no. 3043/00



Congratulations on your choice of the RX-3 racing boat from aero-naut.

The model is supplied factory-assembled, and is ready for the water as soon as you have installed the receiving system. The following components are installed in your RX-3, and are ready to use:

- Retro-style outboard motor with brushless electric motor
- Water-cooling system for the electric motor
- Speed controller
- Steering servo

The following components are required before the RX-3 can be run on the water:

- Radio control system and receiver
- 3S LiPo drive battery



Specification - model

Length	735 mm
Beam	295 mm
Weight	approx. 1600 g

Specification - motor

Your RX-3 is already fitted with a Race Retro outboard motor, Order No. 7005/05.

Width	52 mm
Height	160 mm
Length	123 mm

Brushless motor installed: Saker SKF-2828

No. of poles	4
Motor diameter	28 mm
Motor length	48 mm
Motor shaft	4 mm Ø
Shaft length	12 mm
Weight	125 g
Specific motor speed	4076 rpm / V
No-load current	2.0 A
Max. current	49 A
Max. voltage	14 V

Specification - speed controller

Type	ESC-60A SBEC
Continuous current	60 A
BEC	5.5 V / 5 A
Dimensions	50 x 32 x 13 mm
Weight	58.1 g
LiPo cell count	2 - 6S
Nixx cell count	5 - 18

- Finely regulated start-up characteristics
- Isolated power supply for the IC and MCU (Micro Controller Unit) to avoid interference
- Low-voltage cut-off
- Compatible with programming cards
- Start-up guard – motor cannot start until armed, i.e. will not start when drive battery is connected

Important note

Do not run the motor "dry"; the propeller must always be immersed in water when the motor is operating. Before running the motor, lubricate the flexible shaft at the point where the sintered bush is mounted. Running the motor in the dry state may cause damage to the bearing.

Operating instructions

Please bear in mind that incorrect usage may involve a risk of injury, and could cause damage to other components. Please study these operating instructions carefully before operating the boat for the first time.

Important notes

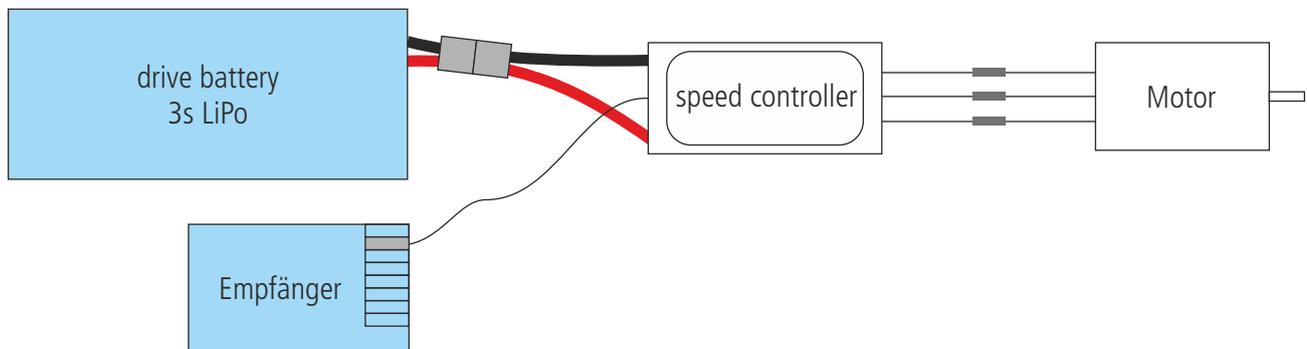
- Read right through these instructions before running the boat.
- Take care to maintain correct polarity when connecting the drive battery. Never mix up the connections. Reversed polarity will result in damage to the speed controller.
- The voltage and current must not exceed the stated limits.
- Never open or modify the speed controller.
- Do not use a motor if it becomes demagnetised.
- Ensure that all cables and connectors make sound contact.
- Do not allow the speed controller to become wet.
- It is essential to avoid disconnecting the battery from the controller while the motor is running, as this could generate currents which would damage the controller.
- Always remove the battery when placing the boat in storage.

Connecting the speed controller

- Locate the receiver lead attached to the controller, and connect it to the receiver socket for the throttle channel.
- Switch the transmitter on, and move the motor control lever to the "Stop" position.
- Connect the drive battery to the speed controller, taking care to maintain correct polarity.
- The motor now generates an audible signal to indicate that it is connected correctly:
 - One beep: brake active
 - Two beeps: brake disabled

The controller and motor are now ready to run. If you do not hear a beep, please check that the controller is connected correctly to the receiver, and that the throttle lever or stick is at the lowest position (Stop). If the throttle channel works the wrong way round, you will need to reverse that channel in the transmitter software.

- It is possible to reverse the motor's direction of rotation by swapping over any two of the three motor wires. The alternative method is to change the setting using the ProgCard.



Programming the speed controller using the RC system

This is the procedure for programming the controller:

- Locate the receiver lead attached to the controller, and connect it to the receiver socket for the throttle channel.
- Move the motor control lever to the maximum (full-speed) position, then switch the transmitter on.
- Connect the drive battery to the speed controller.
- After five seconds you will hear a quadruple signal (four beeps) to indicate that the controller is in programming mode.
- The controller now generates a repeating pattern of five beep sequences; each sequence stands for a program which you can select using the transmitter. The setting is selected and stored by moving the transmitter throttle stick or lever to the lowest (Stop) position.
- You can now disconnect the drive battery from the controller.
- Beep sequence when programming mode is switched on:

♪♪♪♪ Motor brake – by moving the throttle stick to minimum you can disable or activate the brake (setting is checked every time the controller is switched on; see “Connecting the speed controller”).

♪ LiXX battery setting

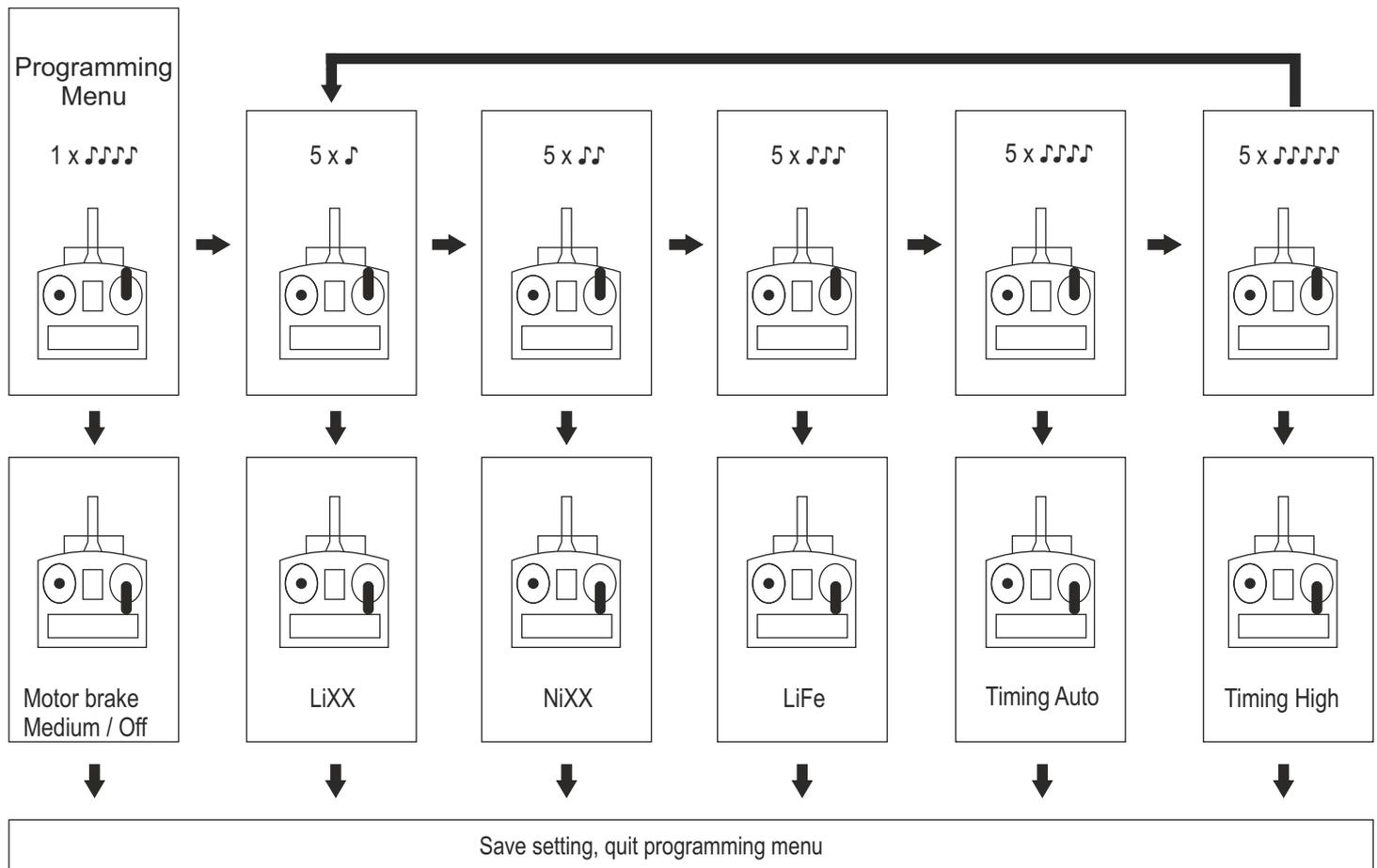
♪♪ Switches to NiCd or NiMH battery

♪♪♪ Switches to LiFe battery

♪♪♪♪ Timing function to Automatic (suitable for all motors)

♪♪♪♪♪ Timing function to “High”(recommended for motors with ten or more poles and outrunners)

Note: if you change the Timing mode, you should check the motor before running the model to ensure that the system works reliably.



Programming the speed controller using a ProgCard (optional accessory)

- Fit the jumper at the correct position.
- Locate the receiver lead attached to the controller, and connect it to the corresponding socket on the ProgCard (orange = signal, brown = (-), red = (+)).
- Connect the motor and drive battery to the controller.
- If you are not using a BEC system, connect a 4.8 V battery to the ProgCard.
- If you alter any setting using the ProgCard, you will hear a beep to indicate that the setting has been stored.

Setting the parameters using the ProgCard

Motor brake

Brake Off	Motor brake disabled
Brake Medium	Motor brake active at a medium level, suitable for geared motors
Brake Hard	Motor brake active at maximum level

Motor timing

Timing Automatic	Automatic timing setting, suitable for all motors
Timing High	Recommended for motors with ten or more poles and outrunners
Timing Low	Recommended for motors with two to eight poles and inrunners

Note: if you change the Timing mode, you should check the motor before running the model to ensure that the system works reliably.

Acceleration

Acceleration High	High-rate motor acceleration and deceleration
Acceleration Medium	Medium-rate motor acceleration and deceleration
Acceleration Soft	Low-rate motor acceleration and deceleration

Battery type

Battery type Li-XX	Li-Ion & Li-Po
Battery type Ni-XX	Ni-Cd & Ni-MH
Battery type Li-Fe	Lead-acid

Low-voltage cut-off

Mode	Li-Ion & Li-Po	Ni-Cd & Ni-MH	Lead-acid
High	3.2 V	0.9 V	2.8 V
Medium	3.0 V	0.8 V	2.5 V
Low	2.8 V	0.6 V	2.2 V

Cut-off mode

Cut-off Mode — Hard	The motor is switched off completely if battery voltage falls below the cut-off point.
Cut-off Mode — Slow down	Motor speed is reduced significantly if battery voltage falls below the cut-off point; the motor does not stop completely.

Direction of motor rotation

The motor's direction of rotation can be reversed by swapping over any two of the three motor wires attached to the speed controller.

Factory default speed controller settings

Motor brake	Motor brake on, medium setting
Motor timing	Automatic
Acceleration	Medium
Battery type	Li-Ion & Li-Polymer
Low-voltage cut-off	Medium
Cut-off mode	Slow down
Motor direction	Right-hand rotation

Notes on trimming and running characteristics

If a racing boat is to attain as high a speed as possible, combined with safe handling on the water, it is essential to align the power system correctly and set the appropriate Centre of Gravity. Naturally this applies to the RX-3.

Experts refer to these inter-related adjustments as the boat's "trim". There are two levels of these settings: the "base trim", which represents an efficient starting point, and the "situation trim"; the latter will vary depending on water and wind conditions, and may differ more or less significantly from the "base trim". It can also take into account the driver's personal preference and habits.

Before adjusting any trim settings it is advisable to place the model on a level surface (table top, workbench, bench seat at the lakeside), so that you can view it easily from the side at eye-level.

Adjust the height of the outboard motor so that the centre of the propeller shaft is exactly in line with the hull bottom at the model's stern. The angle of inclination of the outboard motor, which directly affects the thrust angle, should initially be set to neutral, i.e. the outboard motor is tilted neither forward nor back.

The next step is to set the Centre of Gravity: install all the components in the boat so that it is ready to run, i.e. including the battery and - if you wish - the dummy driver. For the boat's "base trim" the Centre of Gravity should be 280 mm forward of the transom. Measure this distance using a tape measure or ruler, and mark this point on the side of the hull. If you now place the bottom of the hull on a square wooden strip at the marked position, the hull should remain exactly horizontal when viewed from the side, i.e. it should not tip forward or back. If the hull inclines towards the bow or stern, adjust the position of the movable internal components (e.g. drive battery) in the hull until the Centre of Gravity is correct.



Example:

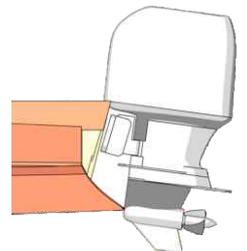
Bow tips down → move battery and / or dummy driver further aft in the model.

Bow rises → move battery and / or dummy driver further forward in the model.

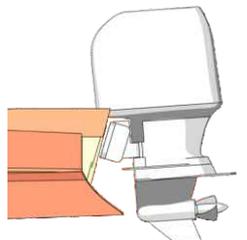
If it is not possible to set the CG correctly by re-positioning the internal components, you must add lead ballast to the hull. Add the ballast in small increments, and be sure to secure it carefully using glue or double-sided adhesive tape.

With this CG position your model is set up to run efficiently when the water is calm and there is little wind. The boat "planes" on the last third of the hull, with the bow and midship sections out of the water. This gives high speed combined with good steering response and reliable running characteristics.

If the wind is a little stronger and / or the water is slightly choppy, you will need to push the bow down onto the water to avoid the boat jumping (pitching): this is achieved by tilting the outboard motor slightly back, as shown in the drawing. Viewed from the side, the propeller shaft is now inclined slightly down at the rear, and the revised thrust line presses the bow down onto the water.



If you want to extract even more speed from the model in calm conditions, then you can try tilting the outboard motor forward slightly. Viewed from the side, the propeller shaft is now inclined slightly up at the rear. This raises the bow and midship section further out of the water, and the boat "planes" on just the last few centimetres of the hull. The effect is to increase the boat's speed, but at the expense of slightly more difficult handling and steering characteristics. In this guise the boat demands experienced hands on the transmitter.



Notes on running the RX-3

Do not move the throttle stick abruptly when accelerating! The brushless outrunner motor generates sufficient torque to cause the vessel to rock or wobble under fierce acceleration, but you can avoid this by advancing the throttle stick cautiously and not too quickly. This applies in particular when starting the boat from a standstill.

Boats powered by an outboard motor are steered by swivelling the whole drive shaft, with the result that the steering response is much more direct. The model responds very differently from a conventional racing boat with rigid shaft and rudder. You should never apply sudden, pronounced steering commands at full speed. Control inputs should always be slight when the boat is at high speed. If you wish to carry out a tight turn, first reduce speed markedly, then initiate the turn, and only accelerate again strongly once the turn is complete.

If the model runs over another boat's wake, it may jump and then strike the water again at an angle; if this should happen, reduce speed until stability is restored.

If you fit out your boat with a dummy driver, you must secure the figure securely so that there is no possibility of movement when running. An unwanted change in the driver's position could alter the boat's CG to the point where control is difficult.

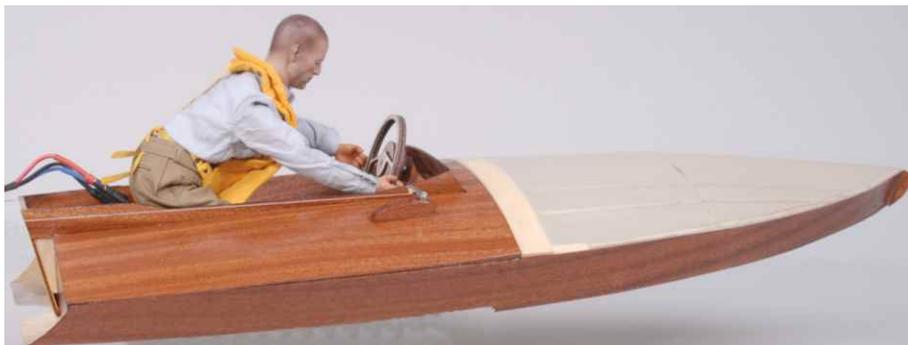
However, if you observe the points stated here, the RX-3 is safe to operate, and has predictable handling; it will give you many hours of fun at the lakeside.



Notes on the dummy driver

In technical terms it is not essential to install a dummy driver in your boat, but there is no doubt that the model looks a great deal better with a skipper on board, especially since onlookers have little idea of the boat's scale unless a driver figure is in the cockpit.

The RX-3 is designed to accommodate a 1 : 6 scale dummy driver. This is the internationally accepted scale for what are known as collector dolls, which include both military figures and civilian equivalents. As a result there is a vast range of complete dummy figures available, together with an extensive choice of clothing and items of equipment. All this means that there are virtually no limits to the type of dummy driver you can install in your model.



Typical dummy skipper shown in the "Spitfire"

This type of dummy figure generally has many articulated joints, making it easy to position the driver in the appropriate kneeling attitude in the boat. Ensure that the figure is securely fixed in the model before every run. Pieces of foam rubber, Velcro tape, rubber bands or screws can be used for this.

You can investigate the wide range of collector dolls available by searching for "collector dolls 1:6", "military figures 1:6", etc. on the Internet. These figures are also available at some of the major modelling fairs as well as in well-stocked toy shops.

Other models available in our range:



Alex 3047/00



Jenny 3055/00



Spitfire 3052/00



Bellissima 3012/00

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