

# Manual

racing Micro Magic HoTT





# Operating instructions

## Assembling the boat stand

Assemble the boat stand and secure the connections with wood or cyano glue .  
If desired, you can plump up the surface for the boat with a soft material.  
For example, No. 701.2



## Installation of rudder

Grease the rudder shaft slightly and mount the helm along with the small compression spring and the tiller. Drag The linkage when the RC system is installed and the rudder servo is oriented in the desired neutral position.



## Installation of keel

Plug the keel in the hull and secure the keel from the top with the enclosed washer and nut. It is suggested to use some thread lock fluid. Through the weight the boat is now ready for further assembly.

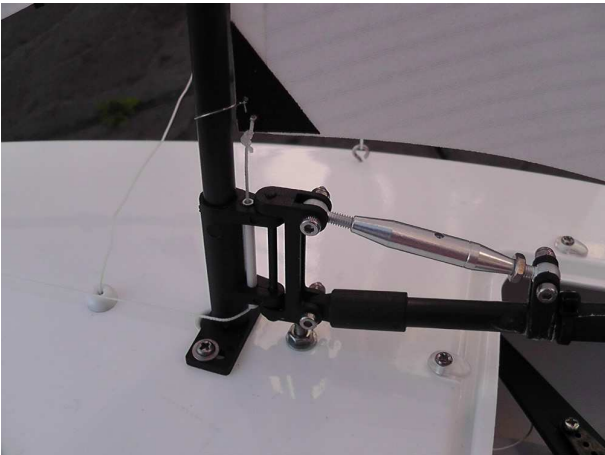
If you plan to participate in ranking regattas, check using a simple cardboard template, if the keel in the fully screwed into position protrudes more than 135mm down from the hull. While this increases the stability of your boat in recreational use, but is not allowed by the current class rules in competitions. So, if the result is not as shown in the picture and the hull touches the template, remove the keel again and cut or grind its top sloping edge gradually away about 1 to 2 millimeters material until the keel is deep enough into the hull and 135 mm are no longer exceeded. Then also the thread must be a few millimeters shorter, if necessary, so that it does not hit in the installed state.



## Assembly of the rig

Note: The rig of your Micro Magic RTR is designed so that it can be replaced by another / smaller one if necessary for use in competition, without requiring nodes must be opened. Slide the boom bearing on the mast so that the aluminum press-down is on top. Take the longer cord, with a prepared sliding clamp and run the free end of the bottom through the plastic tubes on boom fitting. Loosen both screws on the mast plate, insert the mast with the fitting completely into the hull, so that the two lugs engage the boom bearings in the recesses of the mast and the mast plate rests on the hull bottom. Tilt the mast until it stops backwards and screw the mast plate firmly back.

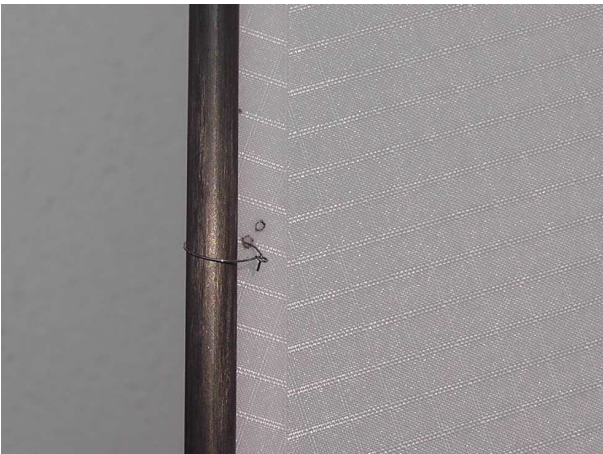
Attach the masthead already ailing backstay at the rear by putting and move the loop over the round fitting the clamping slide so that the stay is slightly stretched, without bending the mast. Attach both shrouds (mast bracing to the side) and keep here also very little tension. Important: The opening of the staples must be facing aft. Twist the eyelets if necessary. Otherwise, the jib sheet could be caught in sailing, which would make the boat nearly unmanageable and it might be a threat to the sail servo.



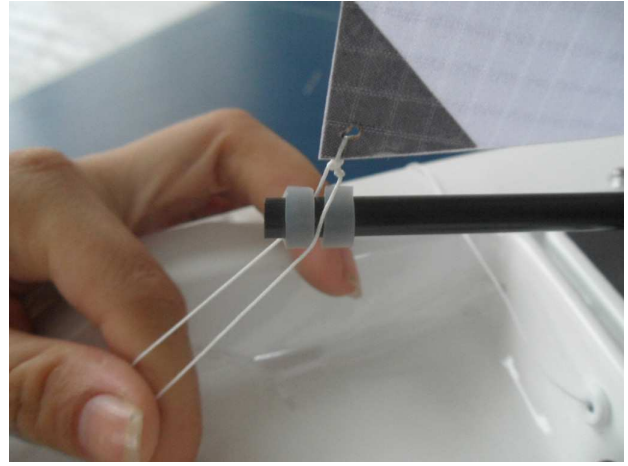
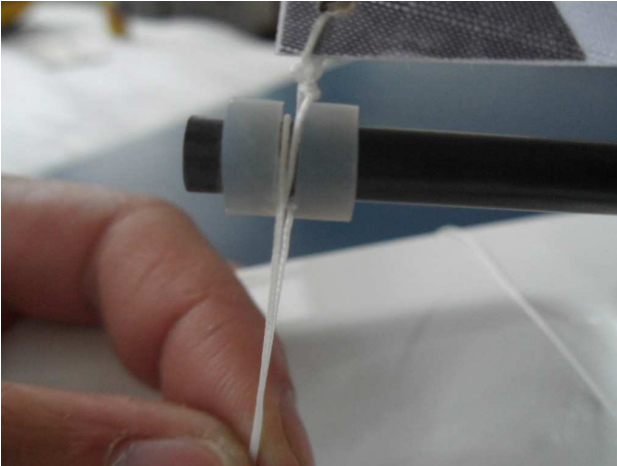
## Assembly of the main sail

Even the mainsail can be optimized a bit for the regatta use. Please skip to the next paragraph if you do not need it.

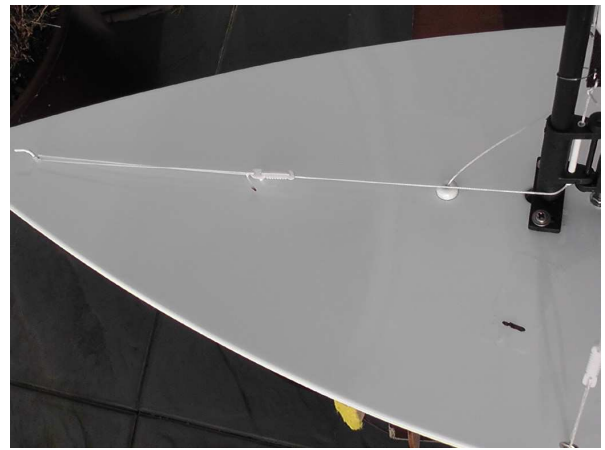
Insert the leading edge of the mainsail (luff) in parallel with a ruler or other straight line flat on a surface. If the luff is straight, you can subsequently set an approximately 4 millimeters deep curve with the round part facing to the mast. Attach to the sail as with masking tape smoothly but without tension on a flat surface. Suitable is, for example, glass or an old mirror. Mark a point about 24 cm from the top (sail top) and about 27 cm from the bottom (tack) to the top of the luff. Cut with a very sharp knife (a fresh snap-off blade is normally sufficient) from the top point upwards and 2 mm from the bottom point down 1.5mm diagonally backwards. Attach the luff again on the pad and mark at about half of the triangle cuts, ie 12 cm from the top and 14 cm from the bottom two more points. Now repeat the process and cut off the new points again about 2 mm and 1.5 mm from the bottom. Now you have an approximate curve by 4 mm depth, the deepest point is slightly above the center and corresponds approximately to the course of a bent mast. This luff curve will later push something extra tread depth to the mainsail. Tension the backstay a little more, so that the mast deflects approximately 3mm. Please check the holes that have been done along the luff to accommodate the mast rings. They should be about 2 mm away from the front edge of the leech. If the distance is too large, you can use a hot needle to make new holes near the old ones. If you have re-cut your luff as described above, place the holes in each place where they meet the cut edges. You should also have holes for attachment to the mainsail head (above) and the bottom (front bottom), each at about 2 to 3 mm from the luff and 3mm spacing from upper or lower edge of the sail.



Now you can install the mainsail. First knot the head with a minimum distance to the prepared string in the top of the mast. The upper edge of the sail should not be more than 5 mm below the boom. Next, fix the rear end of the sail (clew) at the end of the boom (yardarm) between the two silicon rings. To do this you may need to tilt by rotating the pressing-down the mast slightly upwards. Loop the cord attached to the sail once or twice around the mast and put the knots so that the lower edge of the sail (leech) is still 2 to 3 millimeters above the silicone rings.



Now turn the press-down again so that the rear edge of the mainsail (leech) has just a very slight tension. At the press-down should have on each side about 4 mm free thread visible. If necessary, loosen the retaining screw on the clamping bracket and move the stop point according to the boom. You should fix the clamping angle into its final position with a drop of cyano or a tape winding against slipping to the boom yardarm.



Now you can attach the mast that you have assembled before to boom bearing threaded luff straightener to the sail. Insert the eyelet coming out of the clamping slide to the front hook on the deck and move it so that it comes to clamping slide to lie on deck just behind the rear hook. Knotting the upwardly free end coming out from the tube with the tack and tighten the luff slightly by moving the clamping slide on the bow to the stern. The mainsail should now end about 10 mm above the boom fitting. If the distance is smaller, you should try to connect the sail slightly shorter to the top. Otherwise, the boom will collide after a while with the cabin roof.

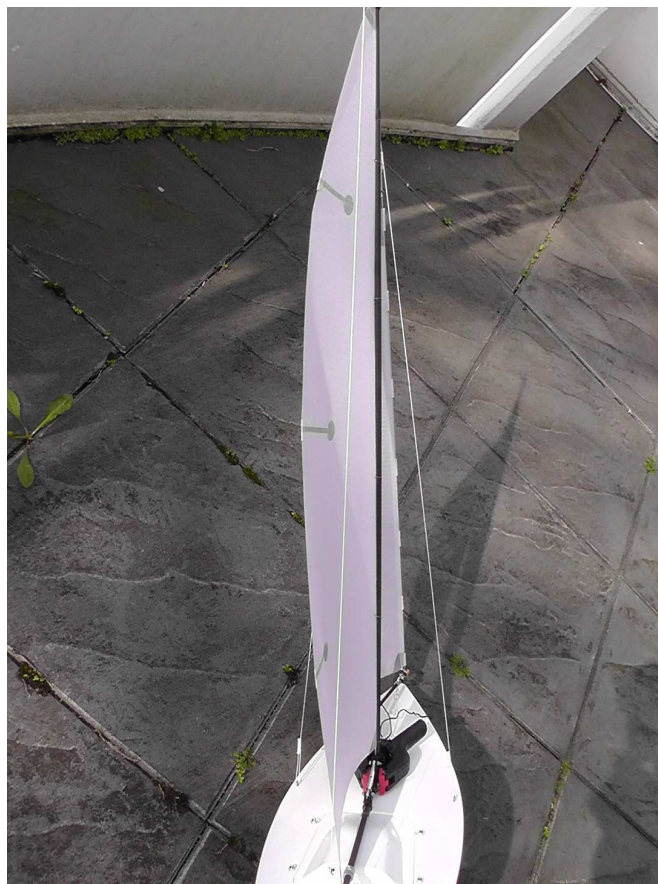
Take the mast rings, run them through the holes in the luff and around the pole and hook the hook in the eyes. Tip: If you have lost a mast ring, you can tie the luff with a thin cord to the mast. Thus, the rings are not too tight and the sail still can rotate well, push each before tightening the knot a 2.5mm strong drill or pin as a spacer in the loop.

Now keep tension out of the leech by opening the press-down a little more than half a turn and then counter.

Move the silicone rings on clew so that about 20 mm belly come into sailing. Now, if you flip the boat nearly horizontally and bring boom yardarm by hand in the middle of the boat, then the leech of the sail at the top of about 3.5 cm apart (twist) must not have the backstay. Memorize this position as the default setting for the twist of the mainsail.



Now take back the tension of the luff.  
Tip: You should never have more tension than necessary on the sails.



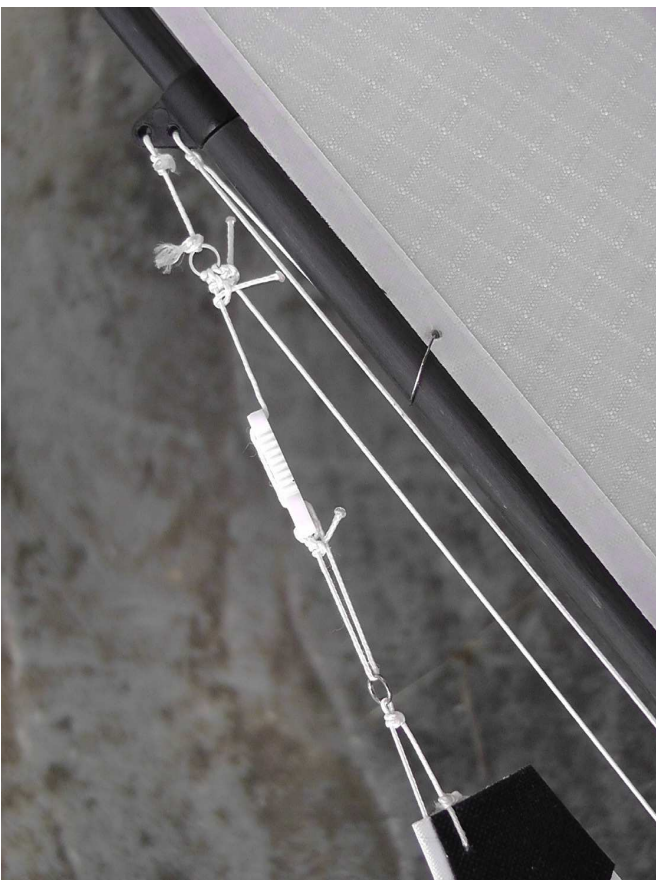
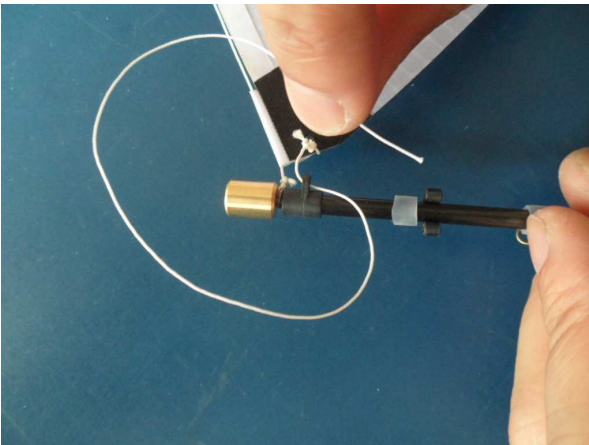


## Assembly of the Foresail (Fock)

Pull the counterweight from the jib boom. Insert the pin through the ring at the lower end of the forestay (the tack) and insert the pin again. If the pin is quite loose, secure it with a drop of glue.

Run the battered already on tack downhaul as shown from front to back through the eyelet of the plastic part on the jib boom and tie it close with the clip at the luff.

Attach the clew as did in the mainsail between the silicone hose pieces at the boom yardarm.



Knot a piece of cord with deferred clamping slide to the ring which is struck about 10 cm below the masthead. The two together lying holes of the clip pusher should be placed down (as in the arrangement backstay). Run the lower end of the cord through the ring on foresail head and back and through the bottom hole in the clamping slide. Clamp the cord firmly as provisionally with a clothespin.

Move the ailing ring to the jib boom so that it is above the front hooks on deck when the boom yardarm is still about 10 mm from the mast. Hang the ring at the prepared bowstringer in the rear hooks on deck. Position the clamping slide approximately in the middle of the hooks. Run the free end of the string through the last existing ring, hang this ring in the front hook and knot the cord up to the ring on the jib boom. The jib boom should have no more than 10 mm from the hook, so do not be attached too high on deck.



At the rear end of the jib boom (boom yardarm) the forestay has already struck. It enables the twist of the headsail to be set later. Run the free end of the forestay upward through the ring on the mast, hang the shroud to the forestay and tie it tight. Pull the terminal tab on the forestay slightly upward so that the leech of the headsail describes a slight curve. Now you can attach the clip pusher of the forestay. The mast is still tense from the backstay or slightly bent aft. Place the clamping slide between the two rings a little below the middle and tie it tight, without giving any additional length in the cord. Move the silicone pieces at the clew so that in the sail there are approximately 17mm belly. Secure all knots with a drop of cyano or plastic adhesives. Cut off the excess cord pieces. With a very small lighter flame close to the cord ends, you can prevent them from fraying. Do not burn the (combustible) cord, neither put the flame near the sails!

# RC system

The recommended location for the receiver is the space provided behind the sail servo. You can, for example, attach the receiver in conjunction with an additional switch in a slightly higher position to the side of the keel mast. Make sure in any case that the cables do not interfere with the movement or the servo arms.

Connect the servos into the power strip on the right side of the receiver. The connector system is polarized; note the small slots. Never force the connection, the plug should engage easily. The sockets are labeled accordingly, brown wire (-), red (+) and orange (signal). (See Figure 1)

The servo sockets of Graupner HoTT 2.4 receiver are numbered. The connection with the label "6" is provided for the battery terminal. Through a V or Y cable (No. 3936.11) it is possible to connect also the servo with the power supply. For other connection options, please refer to the instructions of Receiver GR-12 HoTT (No. 33506).

Attention! Never plug the connector system horizontally (see Figure 2)!

To be connected to a HOTT transmitter, the receiver must first be bound with the Graupner HoTT 2.4 RF module. To do this, follow these steps:

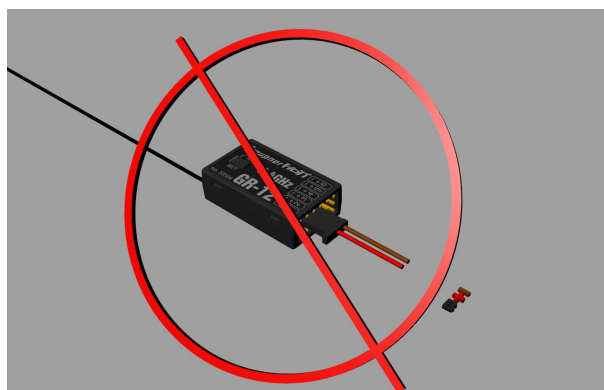
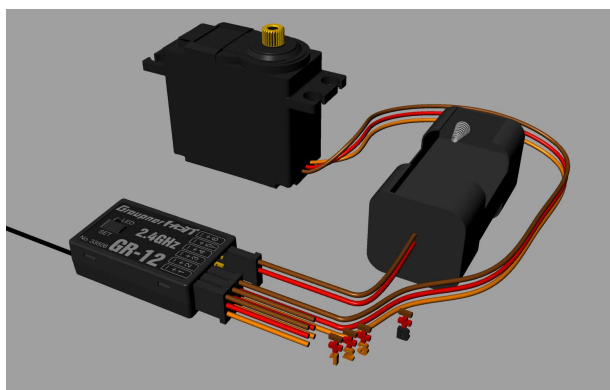
(All steps are described with more details in the transmitter and receiver manual):

Turn the transmitter and receiver on (the receiver is switched on as soon as the battery has been connected

Press the SET button on the receiver for min. 3 seconds, the green flashing LED will then stop flashing.

Then start the binding function on the transmitter (see transmitter instructions), after about 1s, the receiver is bound and the LED in the receiver will light solid green.

If the binding process has been done incorrectly, the LED is red instead of blue on the transmitter and the LED in the receiver does not light up. Then repeat the process.



After binding test the sail and rudder servo function. Usually the cord control lies on the left stick of the transmitter with locking function, pulling back brings tight sailing, press forward releases out. The rudder is located on the right-hand stick. Once you replace the boat with a friend, it helps when you drive the usual assignment. Apart from that, you can of course prove the lever as it suits you best.

Set the rudder servo by placing the lever arm or by adjusting the transmitter so that the rudder arm is a little more to the front when in the neutral position. Bring the rudder blade to the center position and fix the pushrods by tightening the grub screw. Limit the Rudder travel on the transmitter so that no blockages occur. It is sufficient if the rudder at maximum deflection is respectively on the inner edge of the cockpit. If you use a transmitter that does not allow setting of servo travel, you can vary the linkage points of the rudder bar on the two levers.



Set the sail servo to the “hauled” position (the right side of the servo arm shows backwards). Hang one of the two snap-hook to the ring on the main boom. Fasten the mainsail provisionally on carabiner, so the tree has about 5 ° angle. The extension of the tree shows approximately in the middle between the outer corner at the mirror (vertical rear end of the boat) and the cockpit rim. Fine adjustment can be made with the clamping slide in the cockpit.

Do the same with the foresail cord. The jib boom should be opened a little further and there are at hauled about halfway between the mast and deck outer edge. The fine adjustment is done by moving the clips on the jib boom.



Ease now the pods out by pressing the lever on your transmitter. In the fully open position the jib should have approximately 90° angle, the mainsail a little less. The mast should not be placed on the shrouds straight. You may need to adjust the servo travel on your transmitter accordingly.

You can angle set separately by putting the pivot points (blocks) on the servo arm and mechanically for each sail. Here, the block of the mainsail should be placed one or two holes further out than that of the headsail. At the mainsail, you can also slide the ring on the mast forward (more distance) or rear (less distance).

If you have a suitable setting, knot the pods firmly. Protruding end pieces of the servo arm please shorten.

**Your boat is now ready to sail!**

# Recommendations

We recommend to put some absorbent material inside the hull, for example, a piece of sponge, a paper towel or similar. Especially with stronger waves, some water may seep into the interior of the hull through the cord holes.

To begin choose a day with no more than 1 to 2 Bft. wind strength, make a range test and observe all additional instructions for your remote control system. Set sail on the recommended default setting and have fun with your Micro Magic!

## Managing the boat

Sailing with yachts model is not difficult if one knows the relationship between wind direction, boat sails direction and appropriate setting. Familiarize with the sailing theory (eg literature), before using the model for the first time. We can give you the following hints only a small, basic assistance.

The various sailing courses

A sailboat can never sail against the wind (black arrow (W)). In the range of 90 ° (dark gray area) the sails will always flutter (kill) and so can not afford propulsion.

Only when the boat has dropped about 45 degrees from the wind direction, it is in close fetched sailing drive start (transition dark gray to light gray area (2a) or (2b)). This course is named sailing to the wind. Only on this course and hauled, it is possible to sail a sailboat against the wind through the so-called crosses. It sails to a zigzag course: some time on port tack (mainsail on the left side of the boat (2a)) and then after a turn (Boat is rotated with its bow in the wind, from position (2a) through (1) to (2b)) , some time on port tack (mainsail on the right side of the boat (2b)), etc. The effective fast cruising with a sailboat requires a lot of tact and observation and is considered a true art of sailing.

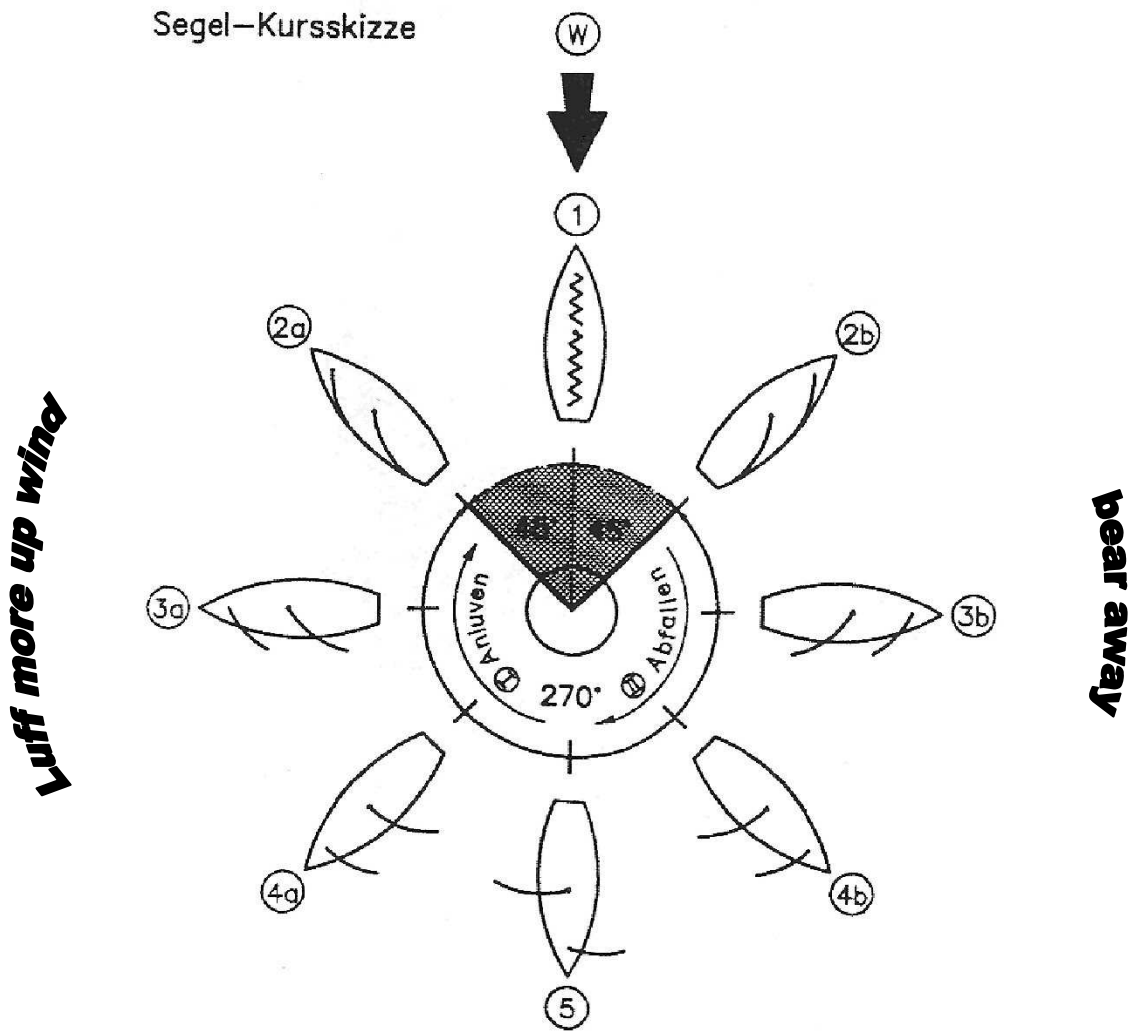
The other courses are easier. When the wind comes from the side, the sailing just opened so far (eased), that they do not flap, about 30 to 45 ° to the longitudinal axis of boat. This course is known as sailing with wind abeam ((3a) wind abeam on the starboard tack / (3b) wind abeam on port).

If the boat even further drops (drop: the boat turns with the stern increasingly downwind (II) / luffing: the boat turns with the bow more and more downwind (I)), it reaches the free wind course, in which the sails are slacked to about 60 ° to boat center (4a / 4b). Only to this two courses, the boat max. speed will be reached.

The boat is sailing directly with the wind away, one speaks of the sail against the wind. Here are the sails max. eased (approximately 90 ° to the longitudinal axis of boat). Various pressure conditions of sailing the foresail will turn on its own on the mainsail opposite side. This process can be caused deliberately by small rudder / course corrections. This feathering is called Butterfly. When the wind is too strong a sailboat can be easily pressed with the bow under water.

When the boat in free wind course sailing is put in the downwind position by rudder it is brought (fall) and then by further steer it is brought back to a free wind course (it is controlled at right angles to the previous free wind course), it rides a jibe. The neck is considered complete when the far eased boom swings from one side of the boat to the other.

To sail faster than the wind the boat normally does not sail straight with the wind but with butterfly slightly lateral wind incidence and it possibly multiple gybes. The jib will be placed in each case on the windward side.



# Trimming of sails and profiles

## ***Sail trim***

The Micro Magic is designed as a regatta boat and offers many settings to trim, which you can use, but do not necessarily have to use the cozy sailing. In this chapter we explain the most important control variables, their respective influence on the sail behavior and how you can take advantage at different wind / wave conditions. The descriptions are deliberately kept simple and reduced to what you can use in the model sailing hobby on your Micro Magic RTR as a beginner.

## ***Mast tilt***

Change the position of the sail pressure point, mast backwards -> more weather helm, immerse mast forward less weather helm, however, higher tendency for gusts with the bow. The mast tilt is adjusted by moving the plate on the deck.

## ***Mast deflection***

If the luff of the mainsail fit, a little more bend -> flatter mainsail profile, too much bending results in a diagonal crease in the mainsail.

## ***Main sail tension***

Is set on backstay and forestay, should match the wind strength. Increase the main sail tension with increasing wind, otherwise the jib twists on too strong and the boat luffs gusts excessively. Once the jib during "downwind" course is shuttling back and forth, the tension is slightly too high. Please note that a change in the tension at forestay backstay or the tension of the opposite Stages affected, the mast deflection changed so that the profile of the mainsail changed and especially the twist on both sailing. Also check the tension of forestay if you have adjusted the tension on a Stag.

## ***Shroud tension***

Your Micro Magic mast is designed so that it could be driven without the shrouds. You should not stand even stress it with too high shroud tension. If you want to remove the shrouds, please do not forget to remove the eyelets and to cover with seal the holes.

## ***Forestay tension***

The forestay should always be tightened to a length so they are straight and unwrinkled. Do not try to compensate any other wrinkles in the sail by strongerly tightening the luff. Because sailing necessarily needs on both the luff sails.

## ***Sail flection***

A lower profile also produces more power but a higher resistance. Basically, a little more curved one moves with weaker wind or wave in the sail. In stronger winds shifting the attachment points on the boom yardarm slightly aft and makes the profile flat. The foresail usually has something less than the main tummy. By solely adjusting a sail you change the position of the sail pressure point. To be able, within certain limits, for example, a little too porting boat with more deflection in the foresail or less deflection in main sail makes a little quieter (porting vice versa).

## ***Opening angle of the sail***

When you open the sails, the resulting driving force rotates more forward. The heel decreases but the boat also leaves less height. While sailing set with the remote control permanently the opening angle of the sail so that it fits to the desired course. To trim, you can change the position of the sail pressure point, starting from the basic setting of the rig through a slight change to sail similar to the sail deflection. A boat can port with more opening angle of the jib or something denser large neutral be held (weather helm vice versa).

## ***Twist***

The twist describes the course of the leech of a sail. The Twist has a huge impact on the sailing qualities of your Mico Magic. With zero twist (just stretched leech), you can bring your boat to stand the wind on the spot, which is certainly not desirable. Basically, you go with stronger wind a little more twist (more curvature in the leech) than in low wind. Stronger waves also require a little more twist than a smooth surface. Unilateral adjustment of twist on a sail can influence sail properties similar as the opening angle. The twist of the jib increases by tightening (shortening) of the forestay. The twist of the mainsail is set by turning of the pressing. A starboarding boat can be set neutral with a little more twist in the mainsail, without changing other control variables.

## ***Base settings***

During assembly of the boat you have already taken the essential settings. The mast is tilted all the back.

If you drive a mainsail without luff curve, the mast is not bent. Otherwise, make a slight bend an aft. The deflection of main sail forestay should still easily extend into the mast.

Stretch a little the forestay. From just not hanging about again half the length of the clip pusher. More information about the tension of the forestay can be found under the heading Main sail tension and in the "stronger wind" section.

Pull the foresail of both sails straight without applying a lot of tension.

The jib has about 17mm tread depth, the main about 20mm.

By sailing the jib boom is at a point close to the middle between the mast and deck edge. The extension of the boom is about in the middle of the sloping cockpit rim.

The twist in the main (sagging against backstay, by mast in the middle) is about 35mm, the jib has about 25 mm Twist (sagging against forestay). Both can determine the inclined on the side of boat in a windless place.

This is the setting of your boat in constant 1 to 2 Bft. Sailing close to the wind, without having a clear tendency to luff or falling. Before making changes to the trim, check first whether the boat, on both sides on starboard tack (wind coming from starboard) and on port, has the same sail performance and adjust if necessary after the center position of the rudder.

The boat can naturally be driven with different settings of the mast and sails. But even top sailors drive their Micro Magic approximately with the described basic trim. You should not deviate too far from the recommended set values, without having acquired further knowledge just at the beginning. If you are traveling at close-hauled the boat sails significantly denser than described in conjunction with the relatively full sail profile of the basic setting, no higher sideways drift on the wind or go faster, but with more heel because of the angle of attack of the sail does not fit.

The adjustments to the trim described below are carried out in the millimeter range and can have a significant impact yet.



# Handling the boat

## *What to do with more or less wind?*

The driving behavior of a sailboat is strongly dependent on the interaction of center of effort and centre of lateral resistance. Both change their position at different wind conditions and so a setting can always fit only for a specific area.

You cannot change practically the centre of lateral resistance in your RTR Micro Magic.

Although you can place the battery at various points, but do so primarily to avoid in high winds immersing the bow. So we focus on the rig.

In very weak winds, the heel of Micro Magic goes to zero and the boat is increasingly porting, ie the bow turns away to a close-hauled course by the wind. If then a slight breeze later returns the boat is hauled, with sailing on half wind course and therefore barely moves.

You can prevent this by always trying to keep something on the wind to get the next gust of wind at the right angle with the bow counter rudder. In the chapter sail trim is described how you can shift the pressure in the sails a little more astern, which works against the porting.

You can, for example, take the mainsail with the clamping slide in the cockpit a little closer or drive it with a little less twist. You can also open the jib a little further, or with a little more twist. You should not have more tread depth than the 17/20 mm of the base trim. With very, very weak winds, the porting will however not be completely trimmed away.

If the jib at broad courses and light wind does not remain in the open position, but commutes, reduce somewhat the tension of the forestay (and possibly the luff).

In stronger winds (from the default) your Micro Magic is increasingly starboarding, the bow wants to turn into the wind because the sail pressure point moves astern. If you are surprised on a half or close-hauled course by a gust, open slightly the sails and give you a little counter rudder. With practice, you get the right feel for in both thumbs. The opening of the sail is more important than the mere laying of the rudder.

With a change in the basic trim, you can reduce or compensate the displacement of the sail pressure point. Keep initially the boat hauled, sailing angle to the wind and watch the foresail (never hold a right angles against strong wind!). When the twist increases strongly in incident wind, ie the jib boom is raised significantly, then you should increase the tension of the forestay. This is also a matter of feeling. You may adjust the headstay in two steps and in between once the backstay. Do not forget to twist the sail again by tightening the forestay. As already mentioned, after a change of main sail tension you will need to check or readjust also the entire remaining trim rig.

Reduce the tread depth of jib and bulk to eg 12 / 15mm. Especially at the same time increasing swell magnify the Twist of jib / main on eg 30/40 or even 35/45 mm.

When the wind is even lower, the boat does no longer move, the bow does not move by the wind any more. A somewhat larger opening angle of the jib and turn with start-up (a little more open and hit with more speed, put the helm and take tight) can help a little further. These wind conditions go no longer on close-hauled course with very tight fetched sailing but more open. This will prevent excessive lateral drifting with little driving forward.

On broad or downwind courses the boat will start to dive with the bow. You should therefore place the battery in strong wind as far back in the hull as it is possible. If your boat is immersed so strong that it becomes uncontrollable, you should adjust the sails. With easy kill ends sailing on an approximately half-hauled course you can usually even save your boat to shore, if you missed the timely exit times.

For stronger wind, sailing in the competition conditions different solutions are offered as accessories, for example, heavier keels or smaller sails, with which you can extend the range of your Micro Magic.

# After sailing

## ***Care and maintenance***

Especially with the first sailing please take sometimes the boat out of the water and check that all screws have not become loose, not interlocked ropes, no knots solved and no water is in the boat. Small amounts of moisture inside the boat, especially when used in the rain or strong wind and waves are normal and can be easily recorded and eliminated with a paper towel or a sponge.

Immediately after sailing please take the tension out of your sails. For this purpose you should relax the backstay and relieve the luff at main sail. If after that there is still tension on the luff of the jib, please be sure to relieve this too. If you have driven with strong bent mast and little twist in bulk, you may need to twist after releasing the backstay and the press-down device to relieve the leech of the mainsail.

Open the cabin cover, remove the battery and any wet cloth or sponge.

Wipe the boat with a soft cloth and put it to dry on the boat stand.

For a longer break, you can also dismantle the keel and remove the water from the keel and the mast support.

Check from time to time, the ropes for damage. Damaged ropes should be replaced for safety's sake.

Approximately twice a year you should lubricate the rudder shaft and the thread of the press-down.

**Now all that remains is  
to wish you to have fun sailing your model !**