

Please check the completeness of the delivered antenna kit with the parts list on the invoice. All parts needed for self-construction should be in the kit, except a mast clamp and a boom support. They can be purchased separately if needed.

This manual is only a recommendation on how you can build up a working antenna with the delivered parts. Individual adjustments are possible. In all cases the customer is responsible for the proper function of the antenna.



All lengths and measurements of our antennas have to be followed exactly, otherwise you will not have the predicted results.



Handling of the boom rod:

If the boom rod is split, mount the boom connector first to have the full length of the antenna. Please check the right order of the boom parts to avoid collisions between boom connector and elements. Then mark the points for element mounting according the dimensions table. Important: If you are building a dual band antennas, the first 70cm director is the open sleeve element. The exact position has to be found at fine tuning at the end, so don't drill a hole for the except for the open-sleeve element. Leave 10mm space to the ends of the rod. If your antenna is prepared for pre-mast-mounting, the boom is 15-20cm longer. In this case start the marking at the last director and go backwards. Never measure from element to element, use a folding rule to mark all points continuously related from the starting point. You will avoid that one measuring error will continue on the whole antenna. When you have marked all points, you can disassemble the boom for further work.

Additional hints for 2m/70cm twinband antennas

1. As the radiator is also mounted directly to the boom, make a mark also for it.
2. You can mark a point for the first 70cm element after the radiator. But as it is an open-sleeve element, its final position has to be found during the calibration at the end. So do not drill the hole now.

Mounting reflector and directors:



Now you can drill a hole at the destined position for the parasitic elements (directors, reflector) on the boom, either 3.5 or 4.5mm, depending on the screw diameter. At the end you can mount your parasitic elements like shown in the picture.

Construction of the dipole:

As connection box we use an IP54 electric branch box.



Cut the lug only on one side and cut the middle hole on same side. Cut all overlaying edges at the box so that the grounding plate can be attached flat to the box. Apply the coax socket backwards into the hole and use it as drill pattern for the 3mm holes used for the mounting screws. Attach the coax socket and the grounding



plate with the provided M3x12mm screws (including one flat washer) to the box. After that fold the plate in 90 degrees angle away from the box and drill a hole in the end what will be the first fixation of the box to the boom.

Mounting note: For 70cm antennas and 2m/70cm twinband antennas you have to mount the box backwards on the boom, so that the coax socket looks to the reflector. Your feeding cable then goes over the reflector under the boom and then to the mast. For 2m monoband antennas you are free in which direction the socket shows, backwards or forwards.

Only for twinband antennas: The second lug has also to be cut from the box, because the second connection point will be directly at the radiator. Also the lug could cumber the fine tuning possibilities for the open-sleeve element.

Assembly of the radiator



Slip the two radiator rods over the dipole connector (**maybe you have to burr the inner of the rod**). If your antenna has a 6mm or 8mm radiator, the rods have to be stuck into the connector. **Please check first if the delivered 6 or 8mm rods fit into the connector.**

Important: The given length of the radiator is always from end to end, including the break in the middle. You can let them a little bit longer for fine tuning at the end. For later connection of the choke drill two 3.5mm holes through the inner ends of the dipole. With a 6mm or 8mm radiator drill 2.5mm holes through the predrilled holes in the dipole connector.

Drill two holes in the left and right side of the box, they will hold the radiator. They should be near to the wall counterpart to the coax socket, because the choke need some space in the box

For twinbandantennas:

The two holes for the radiator rods at the side of the box have to be as close as possible to the wall counterpart to the coax socket, because the open-sleeve-element has to be very close to the radiator. Also we need space for the choke in the box.



The second fixing of the box on the boom is directly at the radiator, because outside isn't any space due to the close open-sleeve-element. The dipole connectors for DBY1 and DBY2 have already a hole in the middle for this fixation. At the other antennas you have to drill a hole into the middle of the dipole connector. Use the machine screw without any flat washer (to avoid short circuit) under the screw head for fixation.

Choke for 50 Ohm design yagis

Because 50 ohm design antennas do not need a transformation, they can be fed with a simple coil containing 5-7 windings of 50 ohm coax cable (RG188 PTFE cable is delivered) on a 16mm PVC tube. The one end is connected to the coax socket, the other to the dipole rods. Please be here also careful to keep the connections between choke and radiator as short as possible. By the way, the length of the used cable is not critical, but you should have at least 5 windings. On the coax socket side the shield is grounded via the coax socket and grounding plate to the boom. You can see a picture of such a choke on this page.

Startup and fine tuning

Only for 50 Ohm monoband antennas:

Mount all elements and you are done. To check the SWR you should measure it in about 3-4 meters above the ground with 144 MHz antennas or at least 2 meters above the ground with 432 MHz antennas. Further adjustments should not be necessary.

Only for twinband antennas:



First you have to check the SWR on 144 MHz, it should be better than 1.3 from the start and there should be no calibration necessary. Fix the 70cm open-sleeve element temporarily with tape to the element clamp and put it on the dedicated place on the antenna. Check SWR on 430

MHz. If the best SWR is not at your preferred frequency, you can adjust it by shifting the open-sleeve-element

+/- 5mm. You can do this easily by fixing the element only with insulating tape on the element clamp. Also a change in the length of the element may help, already 1mm has a remarkable impact.

Only DBD1/DBD2 (twinband dipole)

These antennas have a special behavior on 144 MHz because the mast is used as reflector and is responsible for 50 Ohm feeding. Without a mast in the back the impedance is about 70 Ohms and the SWR is not perfect, but should work. You can align the SWR on 144 MHz by experimenting with the distance between mast and radiator.

For all antennas:

Use an (optional) mast clamp to connect the antenna to a mast and do some testing (use minimum 2 wavelengths height over ground). If it works well, you can seal all vents in the box with silicone or hot glue. Some professionals fill the box with epoxy resin to protect it completely. If you don't fill it, leave a small hole in the box on the future bottom side of the box, so that condensed water can flow out. For horizontal protection there are pipe caps for boom and dipole included in the kit, in 144 MHz yagis also for the other elements.

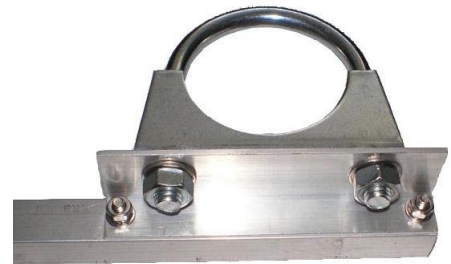
If it not works well, you can try fine tuning with the radiator length. On 70cm also the length of the feeding cable can have a transformation effect. This should not happen with 50 Ohm feeding, but we have 50 ohms only on the resonance frequency. Below and above this frequency the feeding is not 50 ohms and special cable lengths can cause transformation effects. Also the surrounding of the antenna can cause different feeding impedance and therefore mismatching.

Hint: Please check first all element lengths and distances. Also there should not be any short circuit between the two dipole halves.

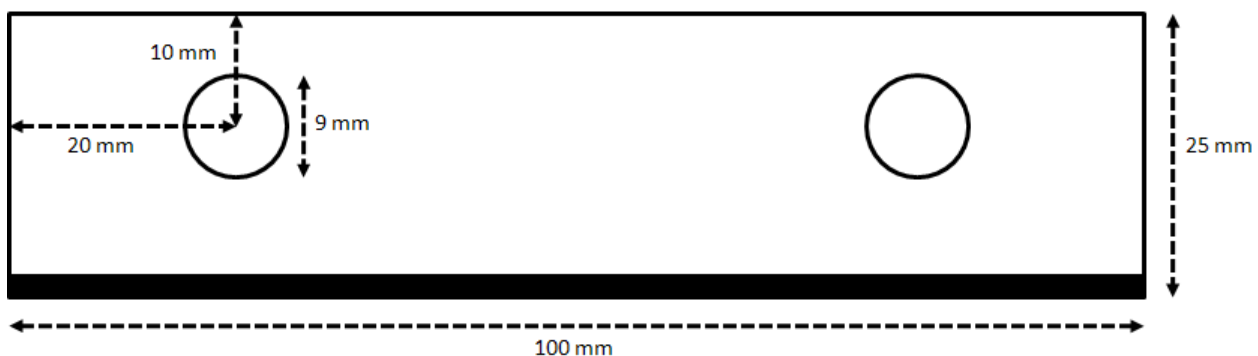
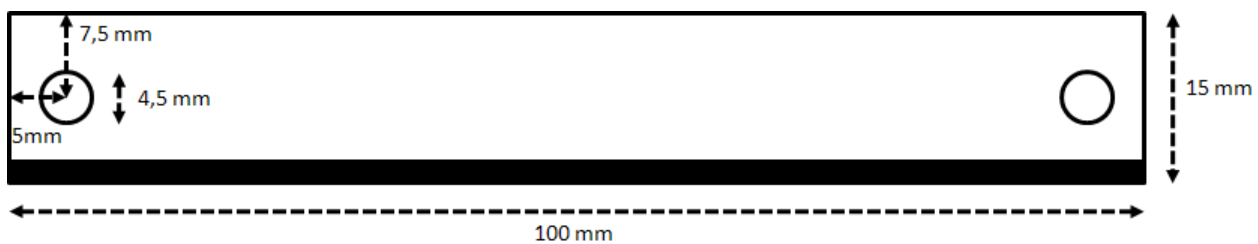
Mast connection (RS-DB, separate purchase)

The shorter twin band antennas may be connected to the mast with an aluminum bracket 25 x 15 x 2mm and a pipe clamp up to 52mm.

It's also possible to use a professional mast clamp (MS15 or MS20), which can be purchased separately.



Drill template for the aluminum bracket



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If you have critic or suggestions regarding this manual, please contact us:

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Disclaimer:

Drilling, cutting and other technical work have to be done carefully and can hurt you. We are not responsible for any accidents which result in following our instructions in the manual. Please be careful.