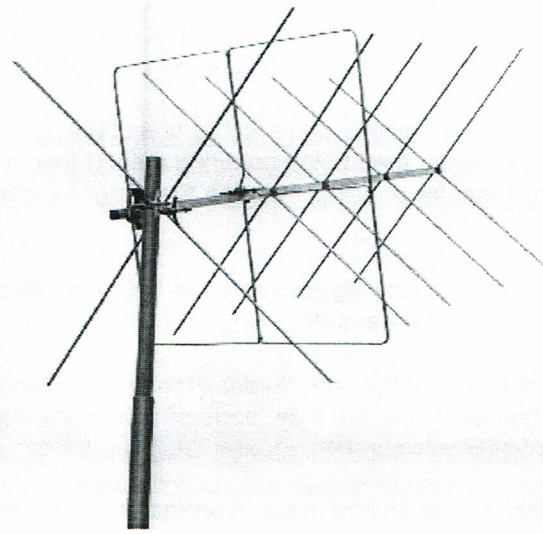
X-Quad

Beams for 2m or 70cm with switchable polarisation



☐ **2m** No. 18010

☐ **70cm** No. 18011

Description
Assembly
Adjusting

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Description

The X-Quad is a step forward basing on the well known boom quads. Its specially for amateur radio use designed properties are:

- Polarisation is switchable (horizontal / vertical / zirkular right / zirkular left / diagonal)
- high gain in comparison with other antenna system through stacking effects
- short boom and simple construction
- Foremast mounting

The radiator is a stacked quad element. Compared to cross yagis all passive elements of a X-Quad (e.g. directors, reflectors) are active elements which leads to high gain at compact size. Changing the antenna's polarization (H/V) is easily accomplished by choosing the proper feedpoint.

Polarizaion switching is done with a coax relay or with one our our remote-control polarisation switches mounted near the antenna feed point, requiring a short feed line only.
With our special phasing harness the antenna can be configured for fixed circular polarisation, see the table below.

All elements are directly connected to the boom and the shield of the feeding line, this any problems with electrostatic noise are prevented.

The connection of the both feeder lines is to be done with N-connectors, the case is waterproof sealed.
Boom and elements are fully made of aluminum. All screws, nuts, washers and the U-bolt of the mast clamp are made of stainless steel and guarantee good contact and easy handling even after years on the roof.

The antenna design and make is protected under german patent law.

Technical Data

	2m X-Quad	70cm X-Quad	
Elements per plane	12	18	
Gain	10,5	12,8	dBD
3-dB bandwidth horiz. (E)	47	36	degrees
vert. (H)	47	36	degrees
F/B Ratio	19	21	dB
max. Power	1500	1000	Watt
length	1460	1270	mm
height	730	220	mm
weight	2,3	1,6	Kg
wind load @ 160km/h (100mph)	74	48	N
connector	2xN-jack	2xN-jack	
stacking distance	2,82	1,1	m
phase line for RHCP	18047	18049	
Order No.	18010	18011	

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Mounting

- Mount the radiator fully: loosen the 2 screws on the outside of the lower part of the radiator and re-screw them after the upper part is set on the lower part of the radiator. The 70cm X-quad is delivered with a complete assembled radiator.
- Remove the 2 nuts M5 on the bolts of the connector case. When you find rubber seals, please remove them too, they are not needed any more.
- put the radiator on the boom and fix it with the nuts removed in step before. the connectors have to point backward (short side of the boom). the loose end of the radiator is to be fixed with a self tapping screw.
- Mount the reflector and director elements with the element clamps provided. 2 elements are mounted together with one screw. Take care about the different element lengths: the 70cm X-Quad has only one director length, the reflector element is longer. The 2m X-Quad has 3 different element lengths: the reflector is the longest, the first director (nearest to the radiator) is shorter, the other 3 directors are the shortest with same lengths.
- Mount the mast clamp: the antennas are made for foremast mounting, the clamp will be mounted behind the reflector element. Take care, the 2 N-jacks must be side by side, not above each other after the antenna is mounted to the mast. When a glassfibre tube is used, the clamp may be set into the middle of the boom.

Each plane has it's own feedline, when the antenna is mounted with both jacks facing downward to the rear (connector case under the boom), the left N-jack is the horizontal plane and the right N-jack is the vertical plane. See figure below.

Normally N-connectors are waterproof when they are mounted correctly. Anyway it's helpful to seal the connectors with something suitable like our cap Order No. 42086 or with self amalgating tape Order No. 23065.

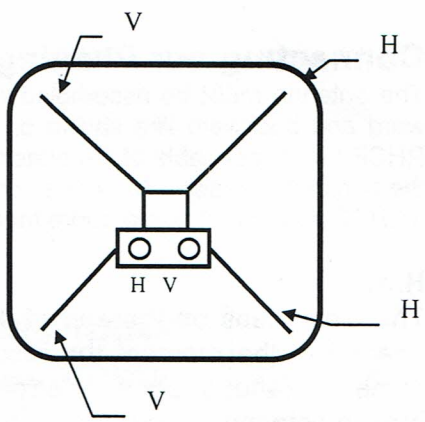
Adjusting

Normally the antennas don't require any adjustments. For fine tuning of SWR the ends of the first director must be bended. Always bend both ends of the director like shown in the figure below. Bended to radiator: the resonant frequency shifts downward, bend to second director the frequency shift upward.
Take care to use the right ends of the director, the adjustments of the 2 planes effect each other a bit.

If the bending is not easy to do, you may twist the flat material 90 degrees, then you may bend it on the thin side of the element which makes adjustments a bit easier.
Normally the are only little adjustments needed.

parts list

		2m-XQuad	70cm-XQuad
	part No.	18010	18011
1	boom	1	1
2	radiator element complete	1	1
3	passive elements	10	16
4	mast clamp	1	1
5	fixed clamp	1	1
6	clamp for boom 20mm	1	1
7	U-bolts	1	1
8	element holder	10	16
9	DIN 84 screw M5x35	5	8
10	DIN 933 screw M6x12	2	2
11	DIN 7981 self tapping screw 3,5x9,5	1	1
12	DIN 127 lockwasher 5mm	7	10
13	DIN 127 lockwasher 6mm	2	2
14	DIN 9021 washer 6mm big	2	2
15	DIN 934 nut M5	7	8
16	DIN 315 wing nut M6	2	2
17	description	1	1



Seen from back of the antenna: right jack is the vertical connector. For adjustment of SWR in vertical plane, bend the left ends of the first director to front or back of the antenna.

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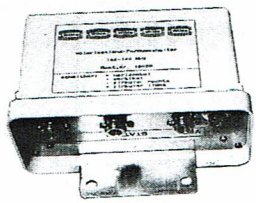
- When the X-Quads shall be used with fixed right hand circular polarisation the 2 planes must be connected together with a phasing line. This line is to be connected directly to the antenna at the feeding point and is made of different cables with different lengths. There is only one feeding cable needed. This solution is a cheap version, but then it's not possible to change the polarisation or use the ant as an single plane antenna. For our X-Quads are ready-to-go phasing lines available, see the picture to the right.

- When the polarisation shall be switchable, our polarisation switchbox can be used (only available for 2m). Then there are 2 feeder lines of the same length needed. From this box there is only one short cable doing the connection to your transceiver. The switching is done manually with the rotating switch in front of the box.

- For remote-controlled switching we provide different switches for mast mounting. Those switches come in a waterproof box and are controlled by a normal DC wire. The antenna connection is done with 2 short cables and there is just a single feedline down to the shack.



switchable polarisations:

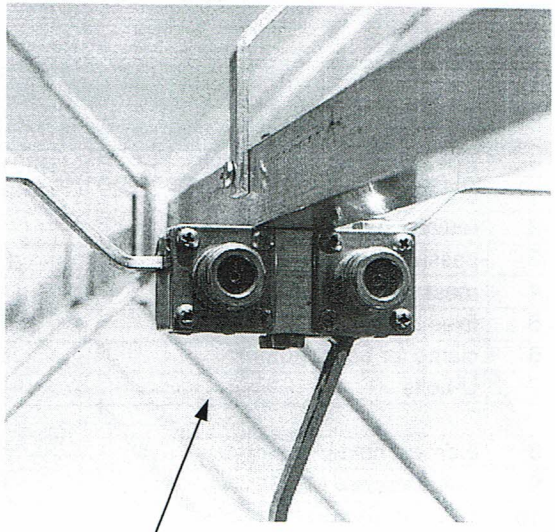
	remote polarization switch	remote antenna switch
vertical	x	x
horizontal	x	x
zirkular right	x	-
zirkular left	x	-

Connecting our Phasing lines.

The antenna mußt be assembled with the N-jacks facing downward and backward like shown on the picture on the right. For RHCP the longer cable of the phasing line has to be connected to the horizontal N-jack. When the connectors are reversed you get a LHCP and thus a loss of more than 10dB!... take care....

Hint:

The black caps on the end of the connector box are only needed in the moment the box is filled with seal, if they come out (after years on the roof) it's not a symptom for a broken antenna.



horizontal connector

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