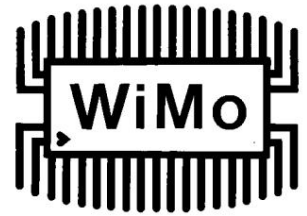


phase lines



Order No. Freq. Connections Antenna

➔	18046 2m free cable ends	59 dL
	18047 2m X-Quads 18051 2m	340 350
	Kreuzyagis 18048 70cm free cables	1000 400
	18049 70cm X-Quads 18052	570 120
	70cm Kreuzyagis	570 290

For connecting cross yagis or X-quads for circular polarization.

The ready-to-connect cables for our cross yagis take the plane offset of the antennas into account.

The phase cables with free cable ends can be used with all cross Yagi antennas, regardless of the antenna manufacturer.

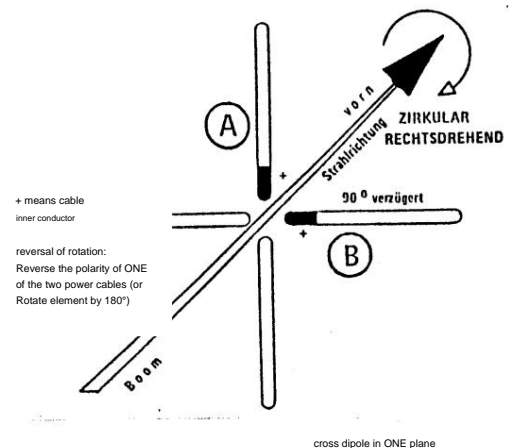
I. Shortening the free cables for antennas without plane offset

The phase shift between the planes must be 90 degrees ($\lambda/4$) for circular polarization. Therefore, the difference in length between the two cables must be $\lambda/4$ (the absolute length is unimportant).

The cables have a shortening factor of 0.66, so in the 2m band the required difference in length between the two cables is approx. 340 mm, and in the 70cm band approx. 114 mm.

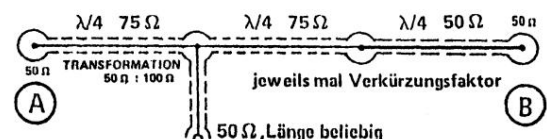
II. Direction of rotation in circular polarization

To determine the direction of rotation, the antenna is usually viewed from the reflector side in the direction of radiation. If the "hot end" of the dipole, which is fed via the extended $\lambda/4$ line, is 90 degrees to the right (=clockwise) of the "hot end" of the dipole with the shorter line, then a right-handed circularization is present (Figure 1, courtesy of DL1BU). The "hot ends" of the dipoles are the sides that are connected to the inner conductor of the



connection cable directly tied together are.

Image 1 Direction of rotation of the cross dipole



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III. Shortening the free cables of any cross yagis with plane offset

In cross yagis, the individual planes are usually not always mounted at the same height for mechanical or electrical reasons. In order to obtain the correct phase shift of 90 degrees ($\lambda/4$) between the planes, the distance between the two individual planes must be taken into account in the length of one of the 50 ohm cable ends:

$$X = L \times C$$

with X: difference length
L: Distance between the individual levels
C: Shortening factor of the 50 Ohm cable (here 0.66)

If the distance between the individual planes of a cross yagi is, for example, 100 mm, one of the 50 ohm cables must be changed in length by 66 mm. But which one?

We first assume that our antenna has no plane offset and first determine to which dipole the shorter cable should be connected (according to II.). This dipole is reference plane zero.

Now let's look at the existing antenna: The following

applies: Dipole with longer cable moved forward --> signal reaches the receiver earlier --> must be compensated by lengthening the cable --> extend longer cable by the difference in length (according to III.). If the dipole is moved backwards, the longer connecting cable must be shortened accordingly.

IV. Connecting the phase cables to our antennas

X-Quad:

The antenna must be mounted with the N-sockets pointing backwards. For right-handed circular polarization, the longer of the two cables must be connected to the horizontal connection of the antenna (Figure 2).

horizontal connection

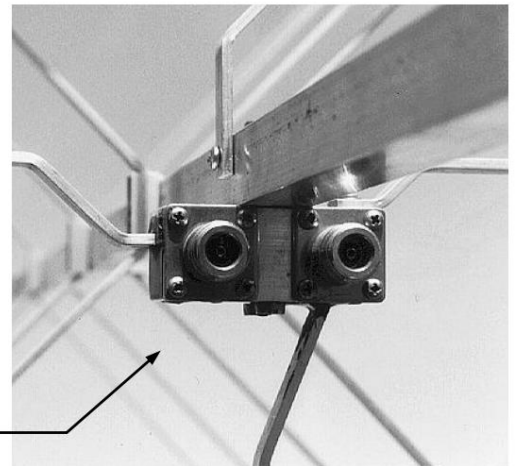


Figure 2 X-Quad connection box

Kreuzyagis:

The dipoles must be installed exactly as shown in the antenna construction drawing (note the position of the connection boxes). If one of the dipoles is installed incorrectly, you will get left-handed polarization instead of right-handed polarization. Depending on the polarization of the other station, this error can result in additional attenuation of well over 10 dB!

The longer cable of the phase lines is always connected to the front dipole (left in the antenna construction drawing).

phase 2.02

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