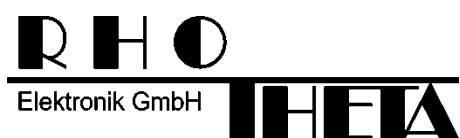


# User Manual

## RT-1000 Antenna Mast



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## **Note**

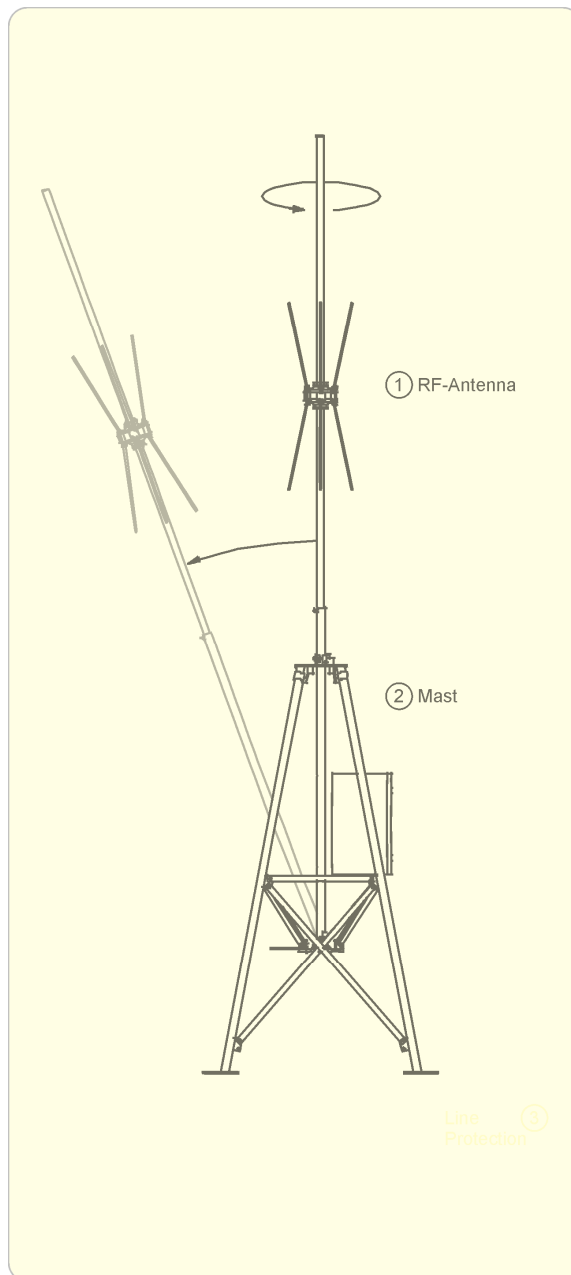
The manufacturer reserves the right to make modifications at any time and without previous information of the here described product.

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# 1 General Description

The antenna mast is a girder mast which has been developed especially for the Doppler antenna system RTA 1300, which makes possible the turning and titling of the antenna for assembly and maintenance purposes. The mast will be delivered in disassembled condition. It has to be mounted and grounded after the assembly on a suitable base. The scope of delivery also includes a waterproof installation box, in which the receiver unit and remote data transmission or the lightning protection can be located. All parts of the mast and the bolted connections are hot-dip galvanized or respectively made out of stainless steel.



## 2 Part List

Part List		
Pos.	Component	Number
1	Support Tube	4
2	Base Plate (bottom)	1
3	Support Tube Clamp (pre-assembled)	5
4	Cover Plate (above)	1
5	10° Step Angle Disk with Tilting Joint	1
6	Vertical Brace (l = 600)	2
7	Vertical Brace with Fixed Clamp (l = 600)	1
8	Cross Brace (l = 1200)	8
9	Suspension Brace (l = 450)	8
10	Mast Tube	1
11	Lever	1
12	Clip	1
13	Screw M 10 x 30	22
14	Screw M 10 x 35	8
15	Fitting Screw (for Lever)	1
16	Nut M 10	30
17	Disk for M 10	60
18	Screw M 8 x 25	4
19	Screw M 8 x 30	6
20	Screw M 8 x 40	8
21	Nut M 8	34
22	Disk for M 8	48
23	Screw M 6 x 30	4
24	Nut M 6	1
25	Disk for M 6	5
26	Installation Box / Antenna Cabinet	1
27	Sun Shade for back an side part of the Installation Box	1
28	Sun Shade for top face of the Installation Box	1
29	Protective Hose	1
30	Bolting of the Protective Hose	1
31	Rubber Joint	1

### 3 Assembly of the Mast

After unpacking and comparing the supplied parts to the list of parts, the assembly can be done. If you want to assemble the mast in a closed room, you should make sure that doors and windows are large enough to transport the assembled mast out of the room. We recommend preparing items which are included in the scope of supply, e.g. sealing silicone and tools, before starting the assembly. You need two persons for the mast mounting.

Additional Items Required		
Pos.	Component	Number
1	Drill machine	--
2	Felt tip pen or similar	--
3	10 mm drill for steel	1
4	wrench MW 10	1
5	wrench MW 13	2
6	wrench MW 17	2
7	wrench MW 19	1
8	wrench MW 22	1
9	Silicone sealing material	--

The mast has to be mounted in a horizontal position and can only be positioned after the assembly. The screws are initially hand-tightened. The tightening is done after completion of installation and positioning.

For the assembly of the mast frame, please make sure to use the corresponding screws with a diameter of 10 mm and the corresponding disks.

The braces designated in the text as “vertical braces” are about 600 mm long; they connect the support tubes directly. The cross braces are approximately 1200 mm in length and connect the support tubes crosswise. Suspension braces are approximately 450 mm long and are used to fix the mast base.

## 4 Installation



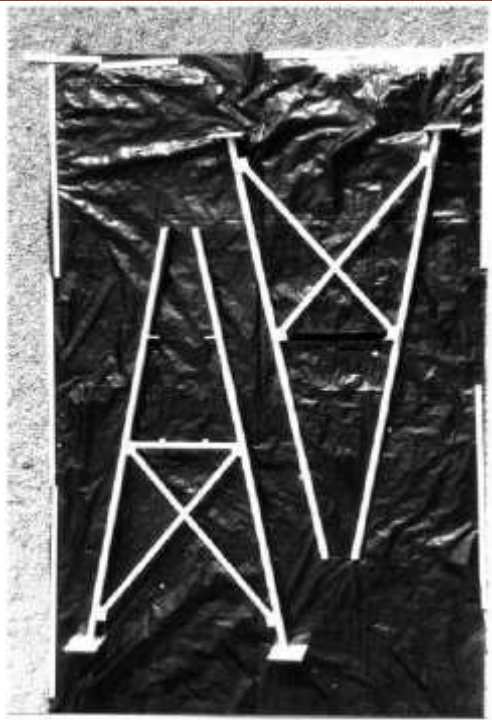
Installation Procedure		Figure
Step	Description	
1	Set the four support tubes according to Figure 1 on the ground. The two supporting tubes with the fixing clamps for the installation box have to be set mirror reversed to each other on the floor. The two other support tubes have to be set in the same way, also the mirror reversed.	
2	Connect the two support tubes (with the fixing clamps) with the aid of the vertical brace, which also has clamps for fixing the installation box. Make sure that the vertical brace, which is "outside" the mast, is directed towards the end of the mast or inwards. All fixing clamps for the installation box are now parallel to each other.	
3	Now you have to fix the two cross braces according to the Figure 2. The cross braces have to be mounted on the fixing clamps on the "outside of the mast". For the fixing clamps on the mast foot, you have to use the upper holes.	

Figure 1: Lining up of support tubes

Figure 2: Lining up of support tubes

**Installation Procedure****Step Description**

4

The second couple of support tubes has to be treated similarly; however, you don't have to mount a cross brace to permit a tilting of the mast tube for mounting the antenna.

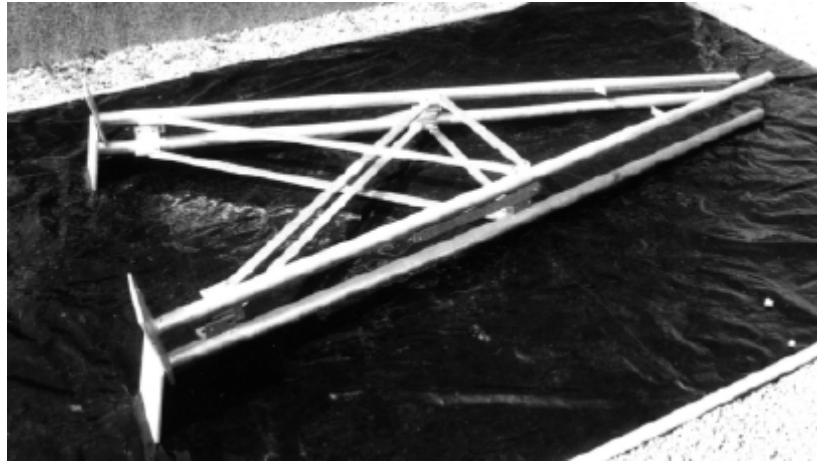


Figure 3

5

Now you have to install the remaining vertical and cross braces on one of the support tube pairs. These are bolted to those fixing clamps on the support tubes, which are perpendicularly fixed to the fixing clamps of the already attached braces.

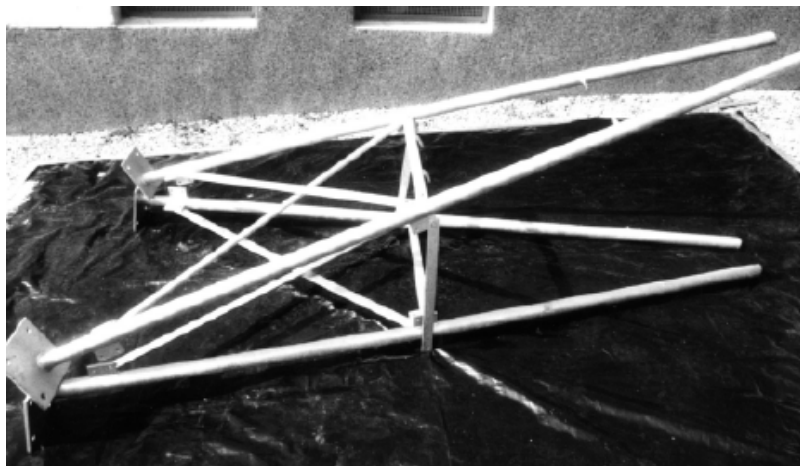
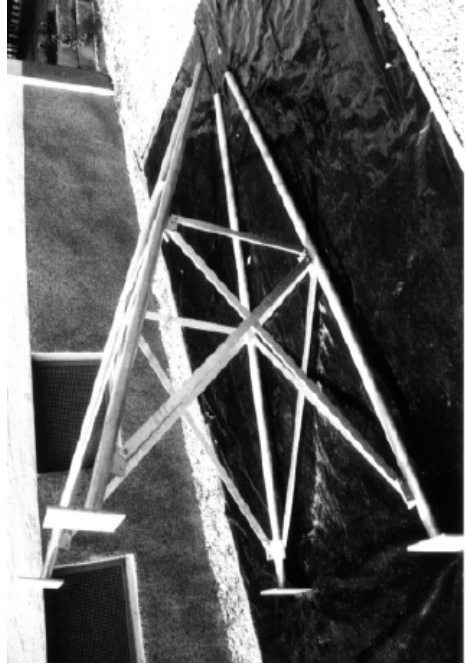
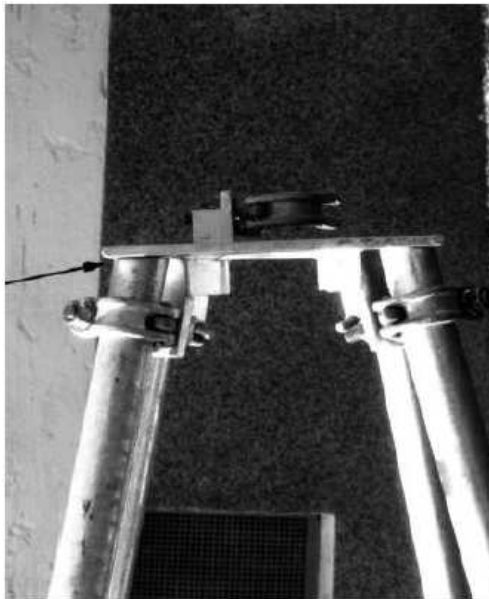


Figure 4



## Installation Procedure

Step	Description	Figure
6	<p>You next put the second support tube pair congruent on the pair with the already assembled brace with the "internal side" towards each other (Figure 3). The two support tube pairs are now connected. Therefore, one person raises the upper support tube pair at the open end until the two vertical braces can be connected with the corresponding fixing clamps (Figure 4). Do the same with the cross braces (Figure 5).</p>	 <p data-bbox="1182 1037 1289 1066">Figure 5</p>
7	<p>Now you can attach the cover plate. The clamps are already preassembled on the top plate. The top plate has a cut-out for the mast tube, which has to point away from the support tube pair with the fixing clamps for the installation box. Now you can open the clamps completely and move them over the lower support tube pair. To bring the upper support tube pair into the clamps, you have to impose light pressure upon the support tubes. Make sure, that the supporting tubes are really flush to the cover plate (Figure 6) and then close the clamps.</p>	 <p data-bbox="1182 1749 1289 1778">Figure 6</p>

## Installation Procedure

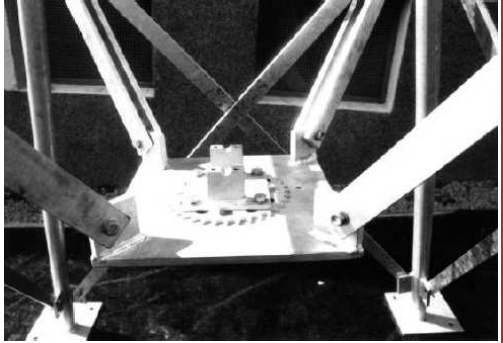
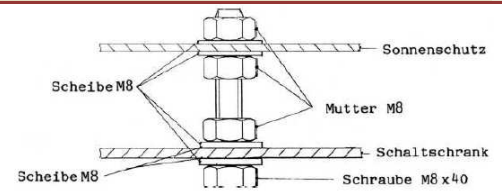
Step	Description	
8	Now the mast can be installed on the flat ground. All screws have to be tightened.	
9	The eight suspension braces for the mast foot plate needs to be installed now on the fish plates, which have remained free (Figure 7).	
10	You now screw the preassembled mast foot plate (see drawing "mast") to the suspension braces. You need to make sure that the hole for the lever of the angular adjustment turns away from the mounting of the installation box (Figure 7).	
11	Open the loose clamps for the mast foot and assemble the mast. The cut at the mast foot has to face towards the installation box. The mast needs to be loosely attached in the gripper clamp, and then screw the clamp.	
12	The installation box needs to be put between the provided fixation clamps. It should be cantered and parallel to the mast tube and should have a distance of 60 mm to it. After that, you have to mark the holes through the holes of the fixing clamps on the installation box.	
13	With the installation box removed out of the mast, drill the previously marked holes with a 10 mm drill bit.	
14	You have to create a breakthrough in the flange of the installation box to carry out the data and power supply underground cable. We recommend to route the cable from the exit site in the ground to the installation box through a galvanized steel pipe (42, 4 x 3,5mm). The steel pipe should be interred 30 cm under the ground and on the other side you have to affix it with the aid of the rubber joint to the flange plate (see drawing "mast base"). An appropriate rubber joint is included. The point, on which the cable should be routed through the flange plate, is already marked on the flange plate.	
15	You now have to mount the installation box with the supplied screws M8 x 30. The screws, which connect the control cabinet to the holding brace, have to be bolted with lock washers (on the side of the control cabinet). To assure a good ground connection to the switchbox and the mast, the contact surface of the screws has to be cleaned from paint. Before final tightening of the screws, they have to be sealed with UV-resistant silicone (such as roofer usually use). Any inaccuracies can be compensated by bending the fixation clamps or by shimming of the corresponding washer.	

Figure 7

## Installation Procedure

Step	Description
16	<p>Now you have to fix the sun shades with the supplied screws M8 X 40. First the screws are bolted from the inside to outside. You'll use 2 washers per screw and seal them with silicone before tightening. On each screw sticking out from the casing, you have to put a washer at distance/ intervals of 20mm. Attach the sun shades and the washers and screw them together (Figure 8).</p>
17	<p>After installation of the mast at the site, protect the cable running from the antenna to the installation box with the supplied protective tube. Mount the gland for the protective tube into the bottom flange in the control cabinet. Then you have to put the protective tube in it, and the other side should be shifted 30mm into the mast tube. At the lowest point of the protective tube, you have to drill a hole to drain possibly occurring condensation.</p>



**Figure 8**

### **Caution**

During installation, the antenna cable has to be pulled from the control cabinet through the protection tube and the antenna tubes before it will be connected to the antenna.  
(Round plug does not fit through the protective tube)

## 5 Functional Descriptions

An appropriate location of the antenna is prerequisite for the proper function of the direction finder, which precludes possible disturbing reflections by surrounding buildings, forest or geographic circumstances.

### 5.1 Tilting of the Mast

To avoid damage to the sensitive antenna beams, you can turn the mast tube for assembly and maintenance through 90°. Then the whole antenna head is accessible. Therefore, the four terminal screws of the tilting joint have to be loosened and the upper mast clamp has to be opened. To avoid a sudden tilting of the mast, the mast tube should already be held during opening procedure of the clamp by a second person. When folding back, it is imperative to ensure that the antenna cables are not jammed (see Figure 9).

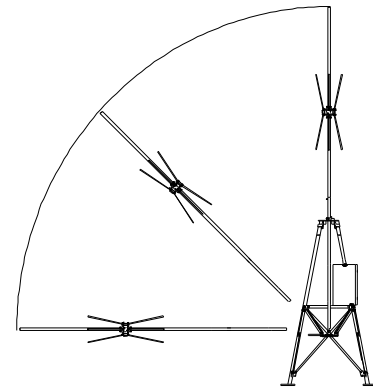


Figure 9

### 5.2 Rotating of the Direction Finder Antenna

To check the direction finder after assembly, the antenna can be rotated at 10° increments. This requires that the four lock bolts of the 10° step angle disk are removed and the clamp holding the upper mast pipe is loosen as far as a rotation of the mast tube is possible. After that, the lever with spring has to be attached on the special screw. The mast tube can be rotated whereupon the lever catches the step angle disk in 10° increments. The connection cable to the antenna must not be stretched by turning too far (Figure 10). Should the mast tube rotate only with difficulty, or even not at all, the four screws on the bottom clamp of the mast tube holder should be eased.

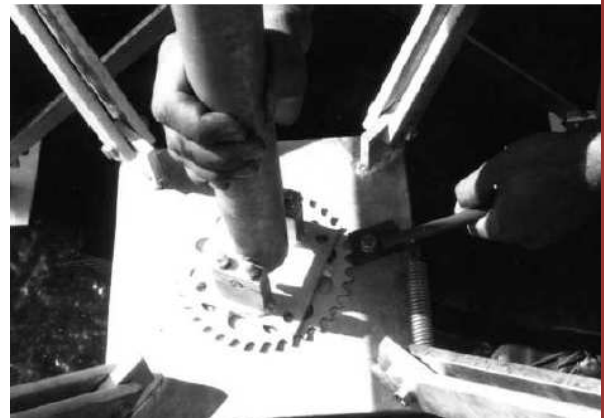


Figure 10

#### **Caution**

You have to control if the four fixing bolts of the 10° step angle disk are tightened and if the four screws of the clamps are loosened.

## 6 Base

The base for antenna mast RTA-I306 C consists of 4 single concrete bases. The floor plates of the antenna mast will be fixed on these concrete bases by screwed anchors. The bases can be produced by using concrete pipe tubes (DIN 4032 or similar) of at least 30 cm inner diameter and 1 m length as permanent shuttering. There must be a cluster from concrete, at the lower side of the tube, in order to prohibit the base socket from rising in case of frost. Reinforcement from steel needs to be planned for so the cluster will not break away from the tube's concrete filling. Furthermore, wrap the concrete tube down to the freezing level with roofing cardboard. The base sockets should protrude for some cm above ground; they have to be flush at their upper side and must end at identical heights, so the Antenna Mast will stand upright. The water level should be checked and adjusted if necessary. The position of each base socket should be observed exactly so the mast feet will stand completely on its socket and the screwed anchor can be tied into the concrete filling. If this should cause difficulties, due to structurally engineered reasons, please plan for bigger tubes.

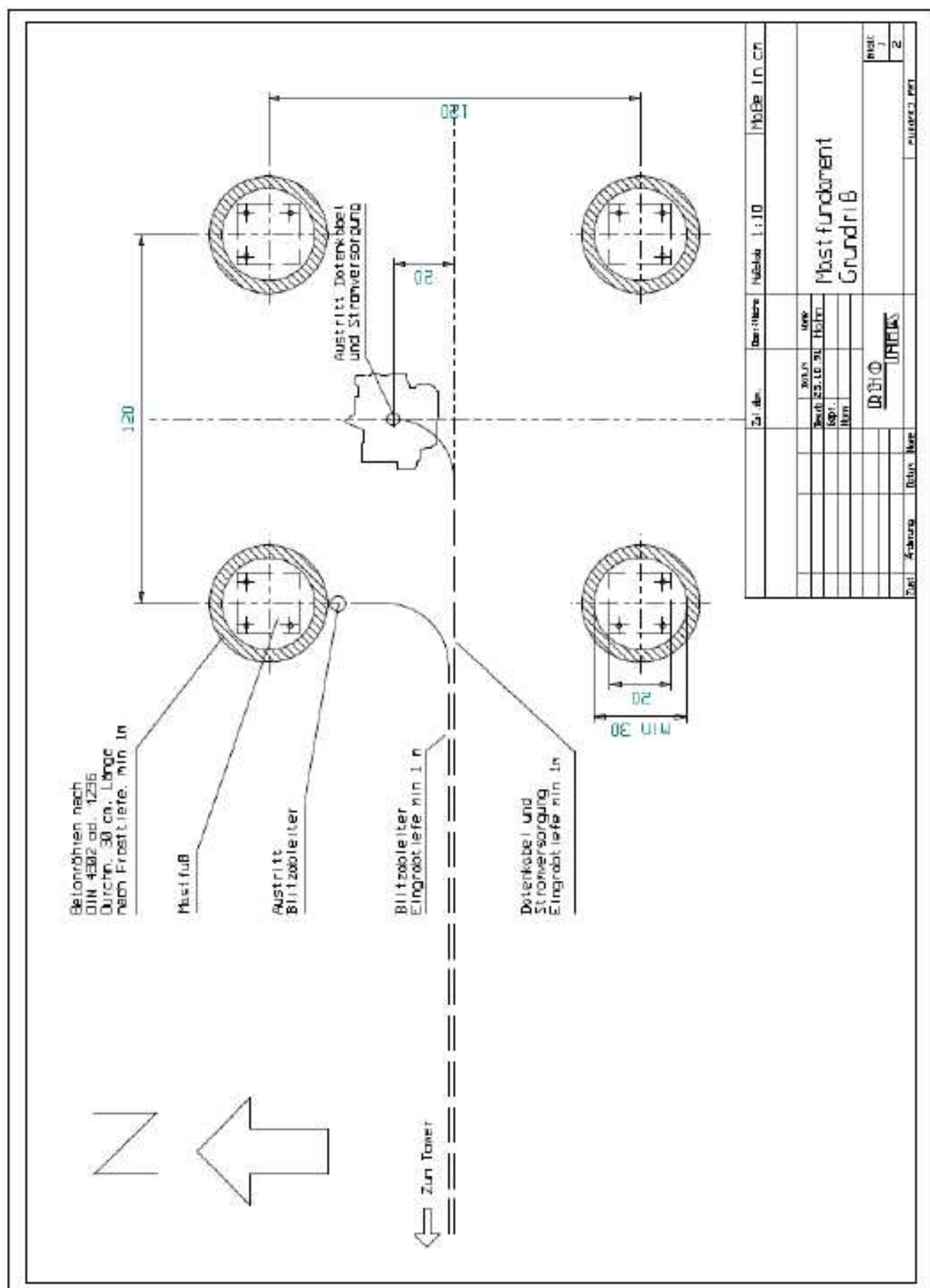
### 6.1 Mounting of the Masts to their Base

- a) Place the mast cantered to the base. Adjust with water level and – if needed – spacers. If an armoured conduit has been planned to protect the long-distance transmittal cable, the mast has to be aligned to this.

<p style="text-align: center;"><b><u>Caution</u></b></p> <p style="text-align: center;">The mast has to be positioned so that the installation box's rear side will show towards south (protection against sun).</p>
--

- b) Drill through mast foot's holes with a driller appropriate for concrete (fitting for the concrete anchors), and tighten the mast by screwing.
- c) Adjust grounding clamps according to figure and connect with grounder by a steel wire, diameter 10 mm DIN 48 801.







## 7 Lightning Rod / Grounding

For grounding, dig a hot zinc dipped strip iron (30 x 3.5 mm) of 10 – 15 m length approx. 1 m deep into the ground. Pay attention that the strip iron will not be affected by field work or ground moving especially in agricultural areas. Normally a cable channel has to be provided for power connection and data cables; therefore, it might make sense to install the grounding strip in the same cable channel. Take care that the strip iron will be separated from the cables by a layer of sand of minimum 10 cm. The grounding strip's exit is marked in the plan. The strip iron has to protrude 20 cm above the base's upper edge. After setting up of the mast, connect the grounding strip to the mast by a lightning rod wire (diameter 10 mm).

## 8 Mechanical Data

Dimensions and Weight		
Pos	Parameter	Value
1	Base (L x B)	142 cm x 142 cm
2	Height Mast	280 cm
3	Height Mast with Antenna	570 cm
4	High Antenna Basis	410 cm
5	Weight	120 kg



## 9 Notes