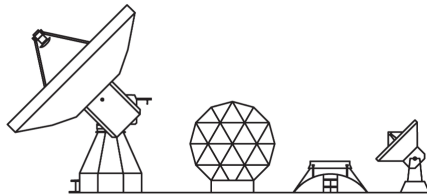


Assembly manual for portable RFI monitoring system

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1 Introduction

This report is intended to serve as user manual for RFI monitoring system installation. The components needed are the following ones:

- 90 cm microwave directional antenna, model AC008 (see Figure 2) from Rhode and Schwarz. For more details see Appendix A.
- Crossed log-Periodic antennam model HL024S9 (see Figure 8), 1-18 GHz, dual-linear polarization, from Rhode and Schwarz.
- Tripod (see Figure 2).
- Control Unit, model GB 016S5 from Rhode and Schwarz (see Figures 10 and 9).
- 10 m Control Cable (see Figure 7).
- Low loss coaxial cables (see Figure 11).
- DC - 40 GHz HP8564E portable spectrum analyzer.

2 RFI monitoring system setup

To explain more clearly the mounting process, its explanation is going to be separated in three parts: assembly, cable connections and positioning of the antenna.

2.1 Assembly

The first step is to find a good location to install the RFI antenna in order to take good measurements, the best option is a high placement with a clear skyline. Once we have decided the location of our system, we have to place the tripod, holding it carefully, and adjusting the inclination to get the base of the antenna parallel to ground. To get that, the bubble has to be within the circle (see Figure1).

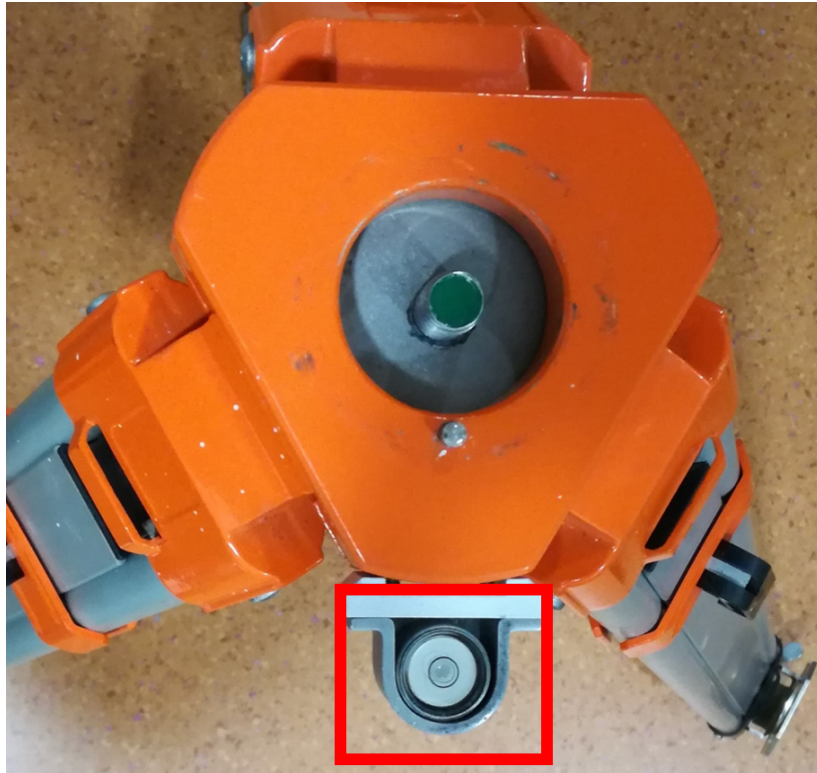


Figure 1: Tripod. The red box shows the reference bubble in the center which means a good leveling respect to the ground.

Then, we can set the parabolic antenna over the tripod (with the feed closed, 2).



Figure 2: Parabolic antenna installed over the tripod.

When this structure (tripod and parabolic antenna) is fixed (by the thread screw, Figure 3), the next step is to down the feed. To do that, take out the lock stick (Figure 4). When the feed is down, take the clamping stick (which

is on the backside, Figure 5) and install it as it is shown in Figure 6, with lock sticks in both ends.

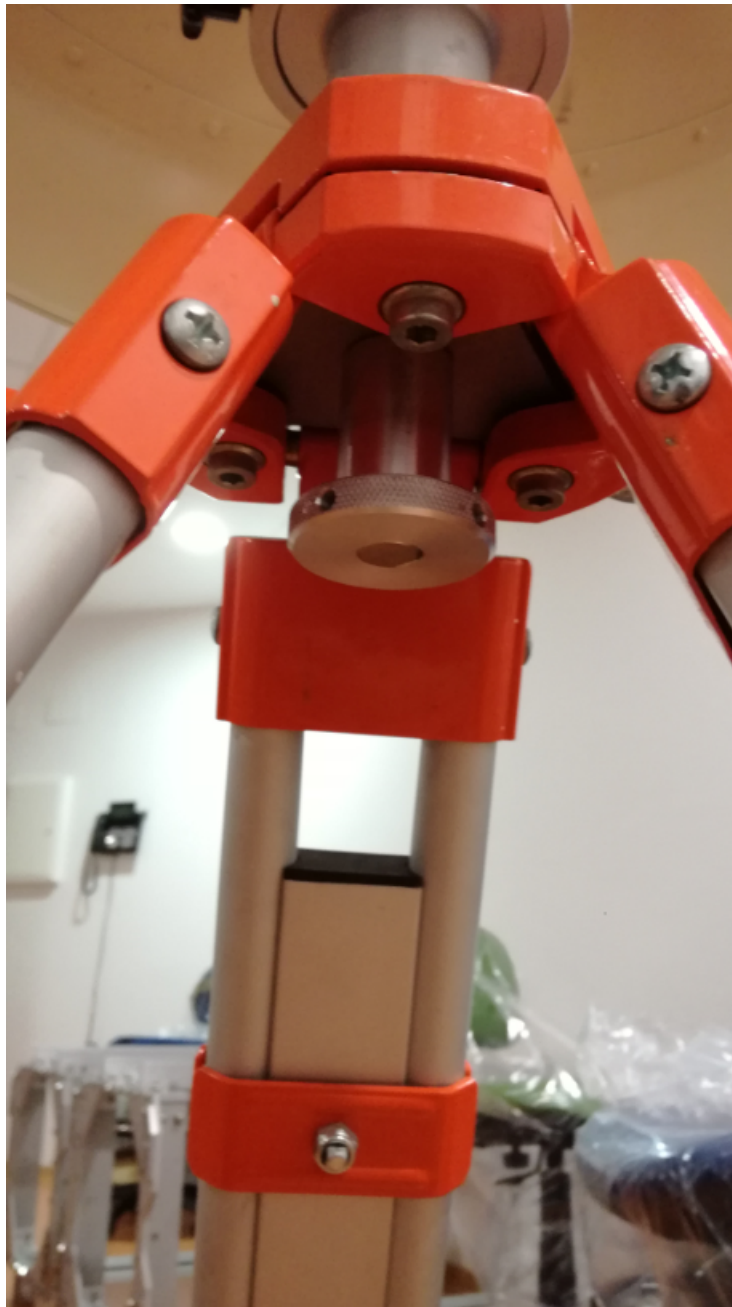


Figure 3: Thread to hold the parabolic antenna.



Figure 4: Lock stick.



Figure 5: Clamping stick to hold the feed.



Figure 6: Clamping stick with the lock sticks.

2.2 Cable connection

Next step is to connect the control cable (Figure 7) between the feed (Figure 8, into control socket), and the the control unit (see Figure 9, into Antenna control).



Figure 7: Control cable

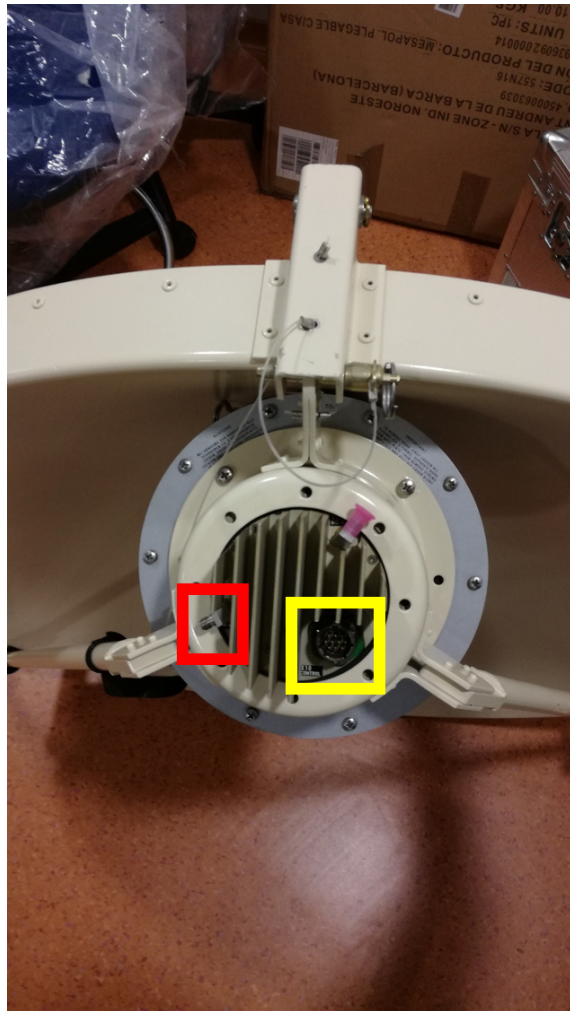


Figure 8: Feed of the antenna with the preamplifier. RF output (red box), control socket (yellow box).



Figure 9: Back side of the control unit.

The control unit (Figure 10) allow to set both polarizations, horizontal (when the button is not press) or vertical, (when the button is press and it appears blue.) There are also several amplifiers to choose, depend on the subband. In case no amplifier were needed, bypass mode is selected.



Figure 10: Front side of the control unit. In this case, amplifier 1 and vertical polarization are selected .

To extract the signal to the spectrum analyzer, coaxial cables (Figure 11) are connected from the RF output port located at the feed to the RF input port of the analyzer.

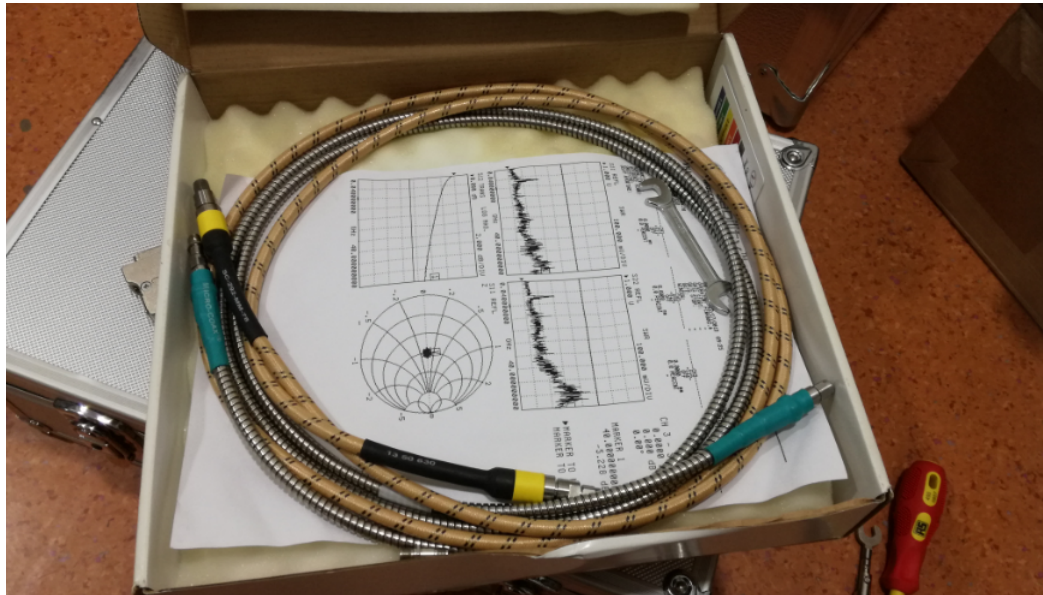


Figure 11: RF Coaxial cables

2.3 Orientation

This system has no rotor so the orientation of the antenna has to be manual, adjusting first the north, as appears in Figure 12, aligning the reference line with the zero azimuth position. In this way we will keep on the north reference. The elevation is also manual and it is adjusting as in Figure 13, where 5 degrees are set.

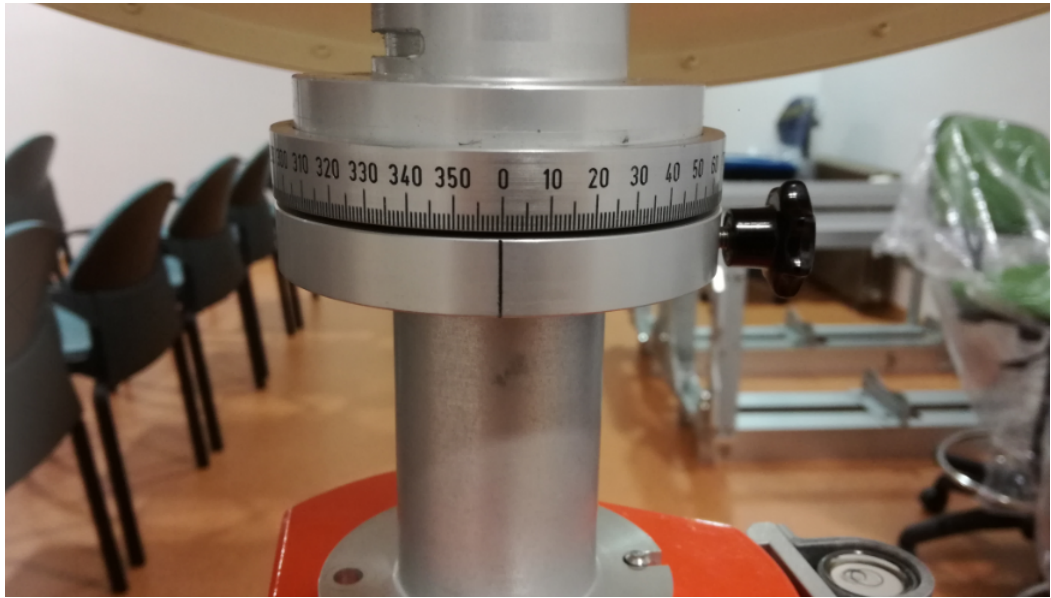


Figure 12: Azimuth position.



Figure 13: Elevation position.

A AC008 specifications

R&S®AC008 Microwave Directional Antenna

1 GHz to 18 GHz/0.85 GHz to 26.5 GHz

Manually or automatically adjustable directional antenna for the detection of RF signals and for field strength measurements



The R&S®AC008 is a manually adjustable directional antenna for mobile applications.

When used with the R&S®RD016 antenna rotator and the R&S®GB016 control unit, the R&S®AC008 can also be automatically positioned in azimuth and elevation.

The reflector has a diameter of 0.9 m and – depending on the feed used – receives signals in the range from 1 GHz to 18 GHz or from 0.85 GHz to 26.5 GHz.

The R&S®AC008 is used for detecting radio signals and for field strength measurements. It can also be directed toward geostationary satellites.

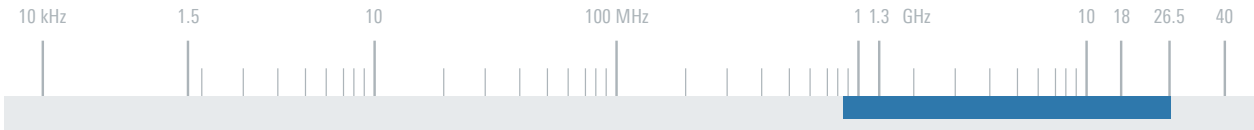
The use of different feeds allows reception of any type of polarization. For transportation, the directional antenna (including the feed) can be collapsed to a handy size.

Key facts

- Wide frequency range
- Reception of linear, dual-linear and circular polarization (depending on feed used)
- Collapsible for easy transport
- Use of active feeds to compensate cable loss possible



R&S®AC008 with R&S®RD016 antenna rotator and R&S®GB016 control unit.

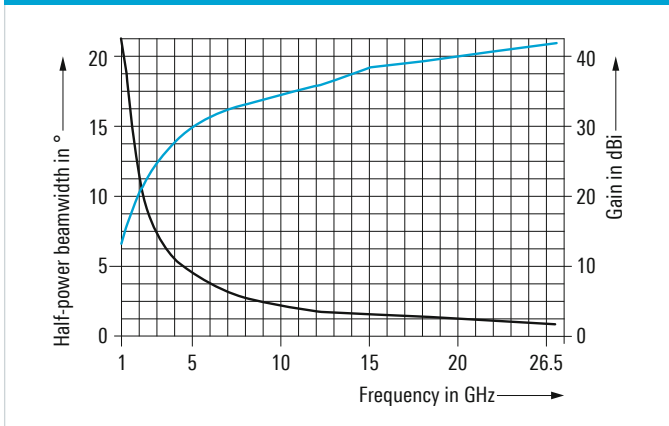


Specifications	
Frequency range	1 GHz to 18 GHz (models .02/.04), 0.85 GHz to 26.5 GHz (model .05)
Polarization with feed	
R&S®HL024A1	dual-linear (model .02)
R&S®HL050	linear (model .05)
R&S®HL024S2	linear/circular (model .04)
Input impedance	50 Ω
VSWR	depending on feed
Gain	15 dBi to 40 dBi (1 GHz to 18 GHz)

Half-power beamwidth	19° to 1.1° (1 GHz to 18 GHz)
Positioning range	
Azimuth	360°
Elevation	-6° to +44°
Connector	SMA female
MTBF	> 100000 h
Operating temperature range	-30°C to +50°C
Reflector diameter	approx. 0.9 m (35 in)
Weight	approx. 12 kg (27 lb)

Ordering information	Type	Order No.
Microwave Directional Antenna	R&S®AC008	
1 GHz to 18 GHz, dual-linear polarization		0671.5017.02
1 GHz to 18 GHz, linear/circular polarization		0671.5017.04
0.85 GHz to 26.5 GHz, linear polarization		0671.5017.05
Recommended extras		
Tripod	R&S®AC008-Z	0671.5117.02
Control Unit	R&S®GB016	4056.7006.03
Control Cable, length: 10 m	R&S®GB016Z1	4056.7270.02
Microwave Cable, length: 5 m	R&S®AC008W2	0751.6931.04
Microwave Cable, length: 10 m	R&S®AC008W2	0751.6931.05
Telescope	R&S®AC008F1	0751.6919.02
Antenna Rotator	R&S®RD016	4077.9008.02
Control Cable, between R&S®GB016 and R&S®RD016, length: 10 m	R&S®GK016K1	4077.9150.00
High-Resolution Elevation Adjustment Upgrade Kit	R&S®AC008-AZ	4061.2173.00

Typical gain (blue) and half-power beamwidth (black) of R&S®AC008 with R&S®HL050 feed



R&S®AC008 with R&S®AC008-AZ high-resolution elevation adjustment upgrade kit.