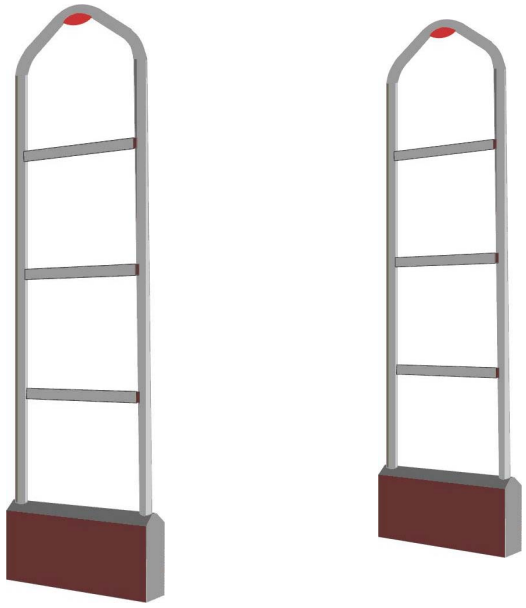
RFID
Tuning Guide



Aquila-System

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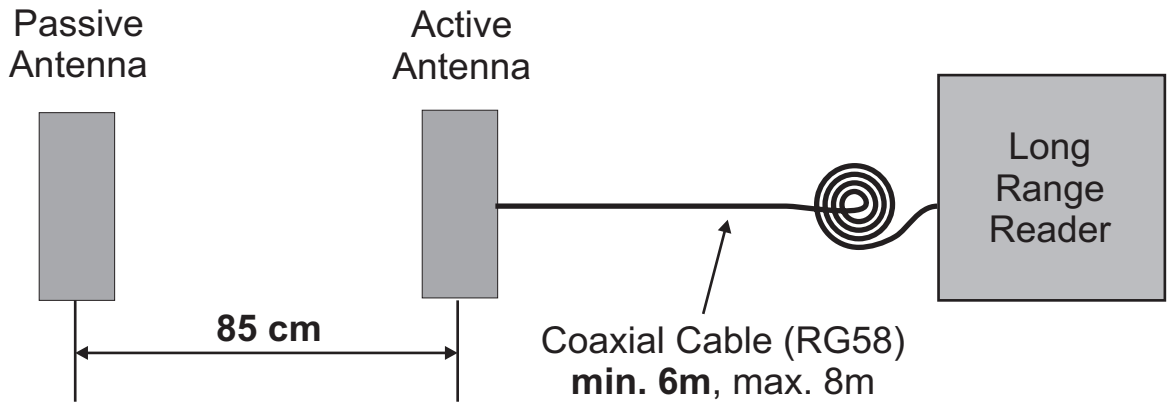
1. Installation

Reference installation layout for a library with CD-Labels



Important: The coax cable MUST have a length of minimum 6 meters.

2. Detection Rate with a CD-Label (label on CD)

Facts:

- Aisle width 85 cm
- Reader output power 6 watts
- Reference CD

Detection rate:

- Side position 90-95%
- Front position 50%
- Flat position 10%

3. Preparation

3.1. Required Tools

- Network Analyzer (HP 8712ET), must be calibrated
- Program file “RFID_Ant.sta” (date 08.08.2002)

3.2. System Preparation

- Prepare the system (1 x passive + 1 x active antenna) with an aisle width of 85 cm
- Disconnect antenna wiring on passive antenna (X3)

3.2.1. Presetting Passive Antenna

- Insert jumpers, J6 = IN and J7 = IN (33 pf + 33 pf). Details see schematic
- Set C10 and C11 to minimum capacity

3.2.2. Presetting Active Antenna

- Insert jumpers, J6 = IN and J7 = IN (33 pf + 33 pf). Details see schematic
- Insert jumper J1 = IN (buzzer) and J3 = IN (33 pf)
- Set C10, C11 and C2 to minimum capacity
- Connect coax cable (min. 6m) to Matching Active Board (MBA) and to the Network Analyzer

3.3. Network Analyzer Preparation

- Start program, recall from diskette ”RFID_ANT.sta”
- Press buttons “Display and (Data and Memory)” on Network Analyzer
- (Calibrate Network Analyzer with the current coax cable)

The initial diagram could look like the diagram below (figure 1).

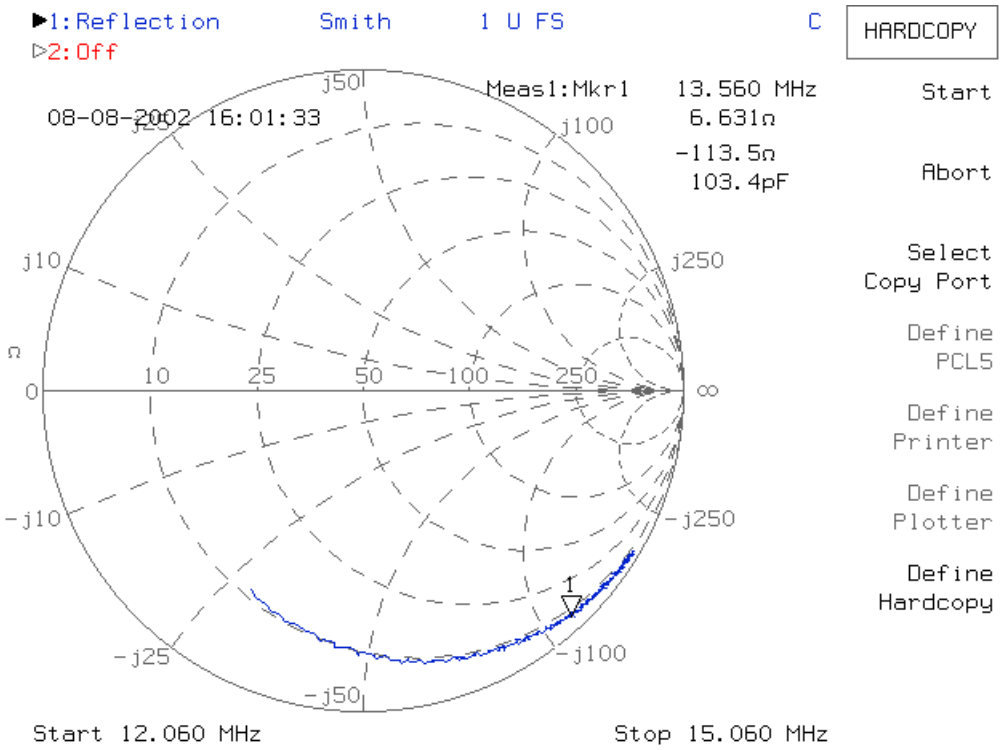


Figure1, Initial Diagram

4. Tuning

4.1. Pre-Tuning

- Turn C10 and C11 to 1/3 of the capacity
- Turn C2 to approx. xx Ω (resistive)
    - o * e.g. 85 cm aisle width, active + passive antenna = 22 Ω
    - o e.g. 85 cm aisle width, only active antenna = 50 Ω

This value varies if the distance between the antennas changes.

4.2. Fine-Tuning Aquila Active Antenna

- Turn on all three (3) trimmers until a similar diagram (fig. 2) is reached (C10 and C11 should have more or less the same capacity, symmetrical).

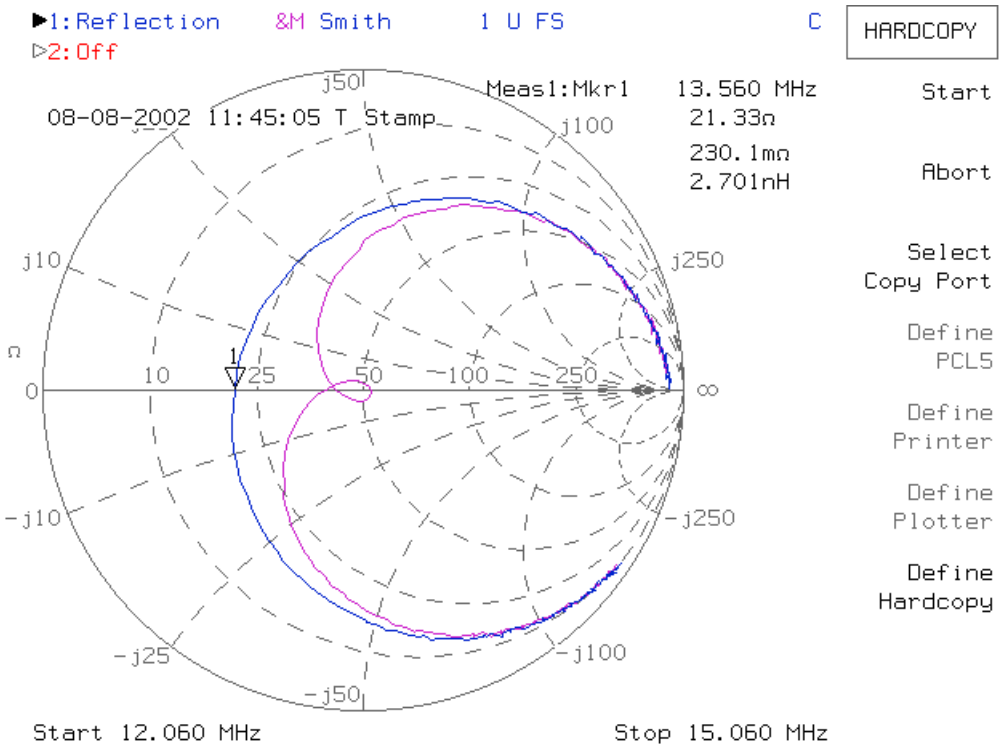


Figure 2, Active Antenna

4.3. Fine Tuning Passive Antenna

- Reconnect antenna wire into X3
- Turn on C10 and C11 symmetrical until the curve looks like the diagram in figure 3

Important: The resistance must be 50 +/- 3 Ω

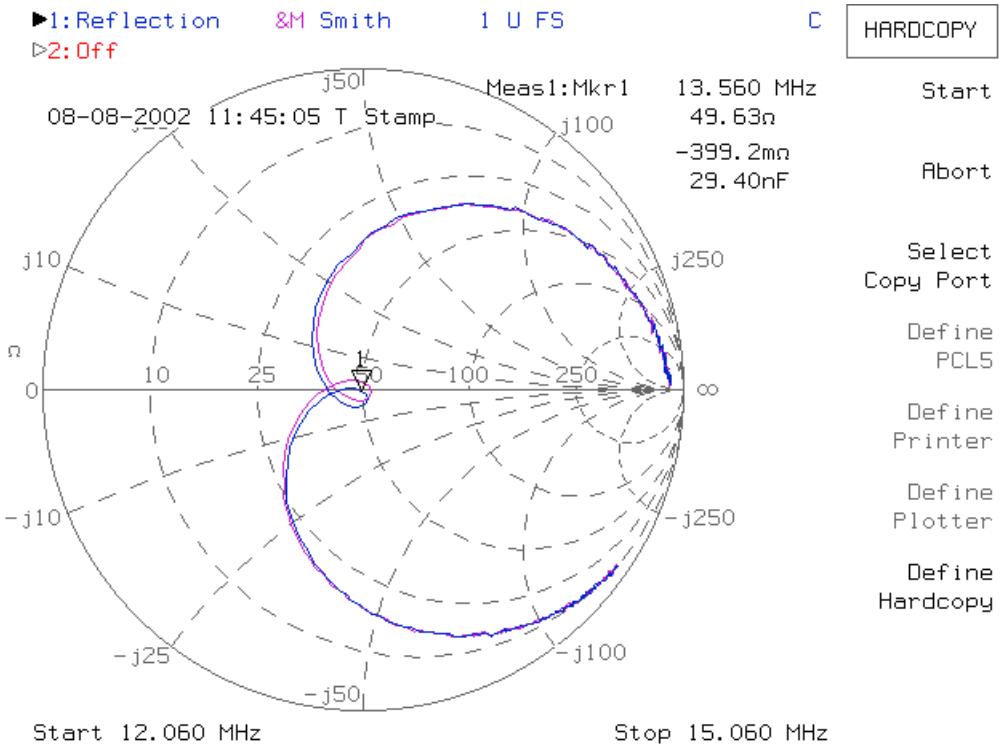
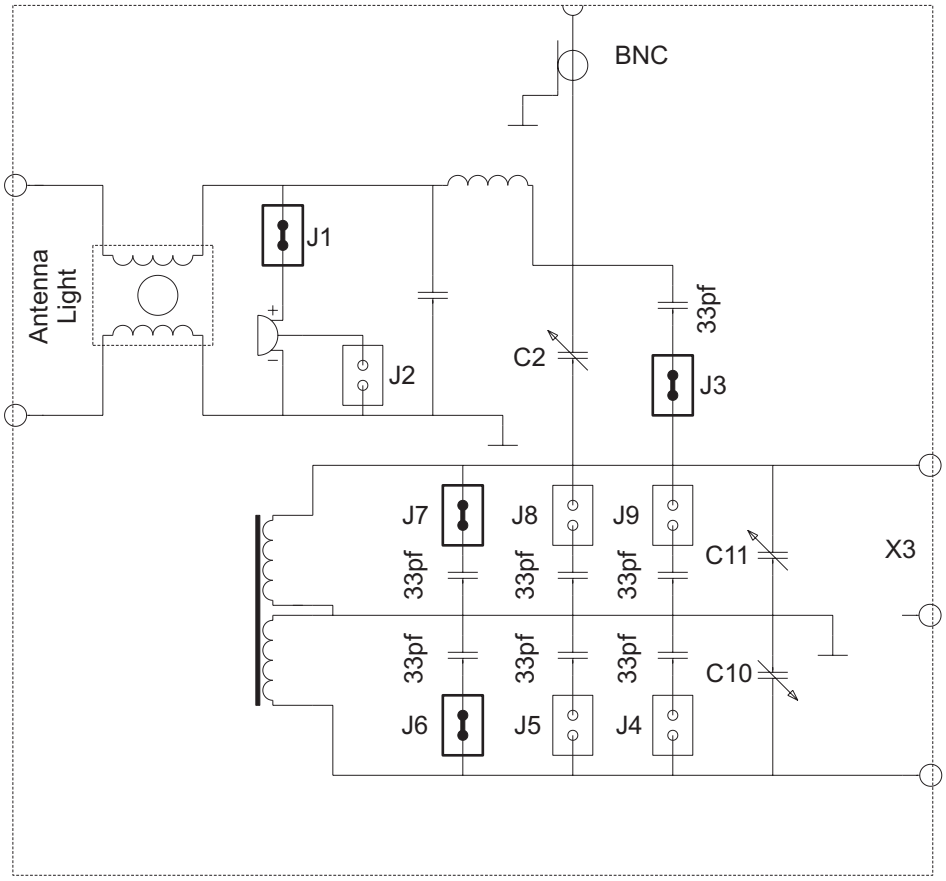


Figure 3, Final Diagram

5. System Test

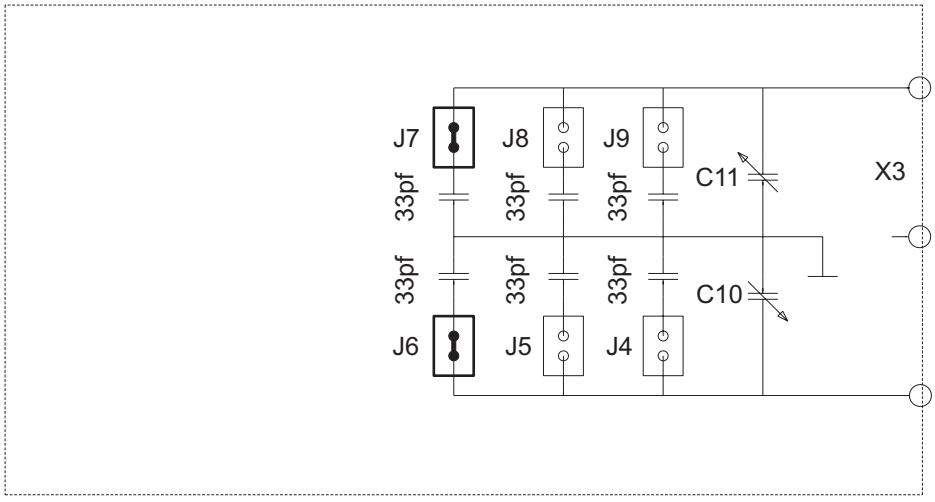
- Connect the coax cable to the long range reader
- Take a reference CD and test detection (see detection rate)

6. MAB Active Antenna Schematic



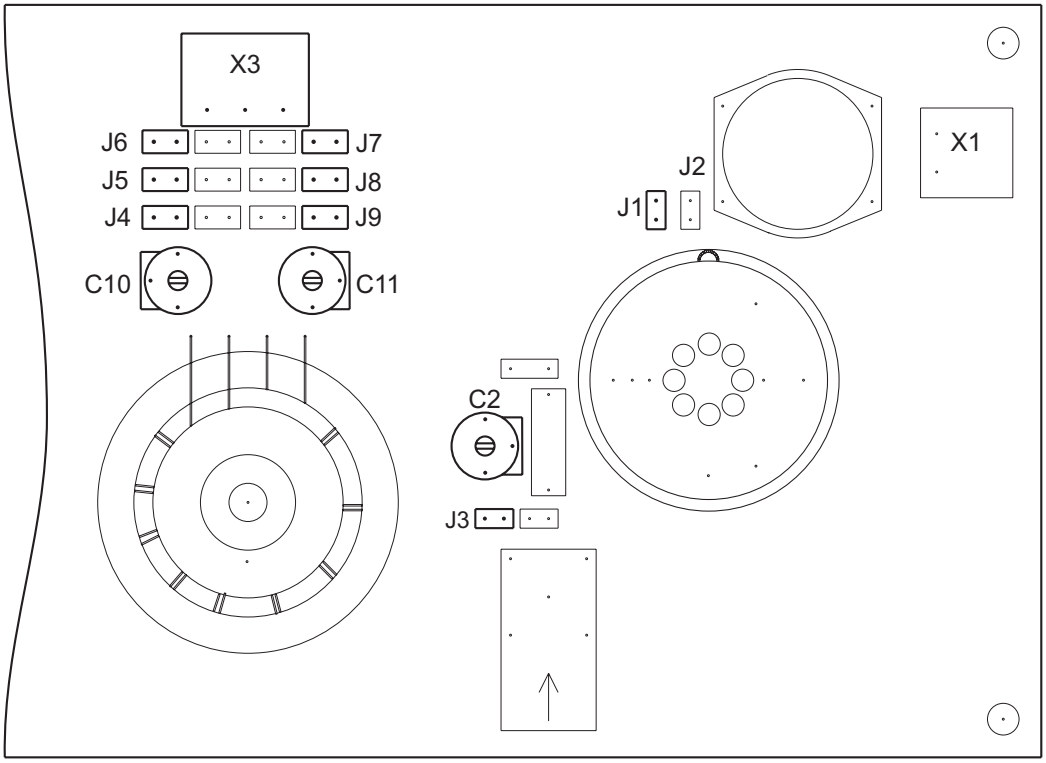
MAB Active Antenna Schematic

6.1. MAB Passive Antenna Schematic



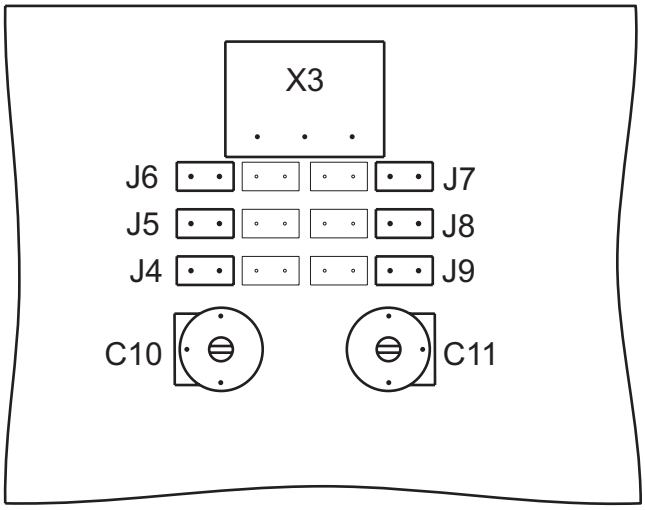
MAB Passive Antenna Schematic

7. MAB Active Antenna Layout



MAB Active Antenna Layout

7.1. MAB Passive Antenna Layout



MAB Passive Antenna Layout