PWR-COBRA-1 RET Antenna System Quick Installation Guide

Scope

This document briefly describes the installation and operation of the PWR-COBRA Remote Electrical Tilt antenna system. It is intended to give an overview of basic installation and operation for experienced antenna users.

Equipment Required

- COBRA™ RET capable antennas
- Antenna mounting hardware (standard or 0–15° mechanical downtilt kit included with antenna)
- Coaxial cables from BTS to antenna RF ports
- CBL-COBRA one feed line and one jumper per additional antenna, or smart bias tees and jumper cables. Bias tees eliminate the need for the one main RET cable run
- PWR-COBRA-1 interface power supply
- RS-232 cable (supplied with PWR-COBRA-1)
- Laptop or computer with PWR-COBRA software (supplied with PWR-COBRA-1) installed

Installation Instructions

1. Install the antennas using the mounting hardware provided. Record on an Installation Configuration sheet the antenna sector, model number, serial number, and pointing angle from 0–360°.
2. Attach the feed lines from the BTS to the antenna RF ports.
3. Attach the female end of the CBL-COBRA *homerun* data cable to the first antenna actuator input port. (The *homerun* cable is the data cable that runs from the base of the tower to the input of the first antenna in the RET system.)
4. Attach the male end of the CBL-COBRA jumper line to the output port of the first antenna and route/connect the female end to the second antenna. Repeat this process until all the antennas are attached to the RET system in a daisy chain configuration. Cap the output port of the last antenna with the cap cover provided. **Please the see note at the end of this document for cable length recommendations.**
5. Attach the male end of CBL-COBRA feed line at the base of the tower to the barrel connector port on the PWR-COBRA-1 interface power supply.
6. Plug the interface power supply (PWR-COBRA-1) into the power source.
7. Attach the RS-232 cable (or USB-to-Serial adapter cable) to the laptop or computer and into the PWR-COBRA-1 interface power supply.
8. Boot up the laptop or computer and launch the COBRA™ RET application software.
9. Click on the **Scan** button (located under the RET/Identification tab) to search for all antennas connected to the RET system. When the scan is complete, all the antenna actuators will be listed by their serial numbers (Figure 1).

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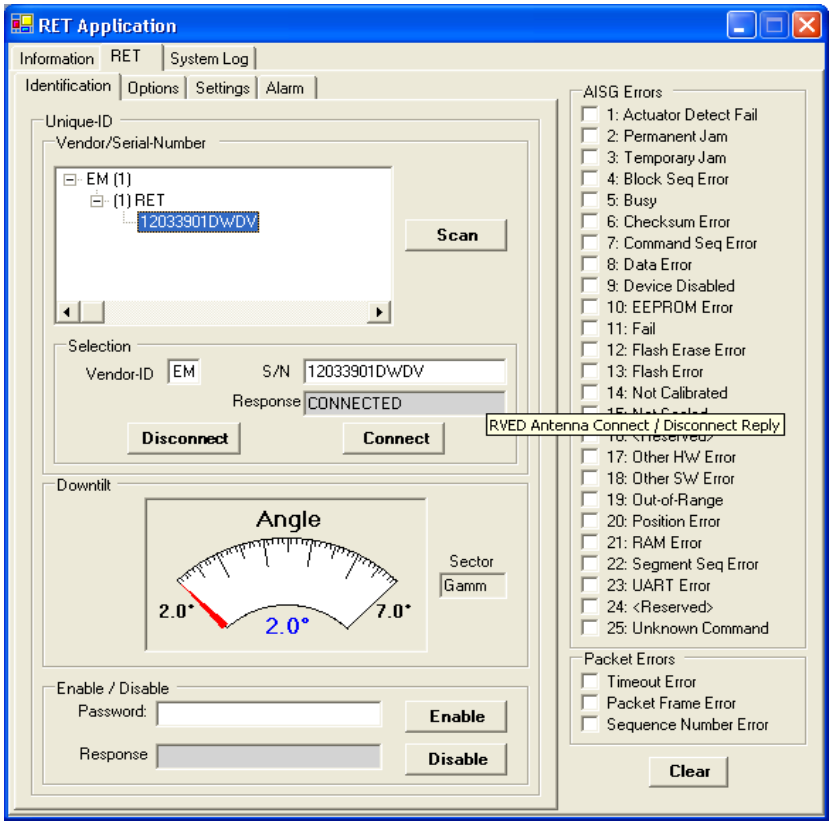

Figure 1. RET Device Scan Results.

10. After the device scan has found all the installed antenna actuators, double click on the **serial number** for the antenna actuator in the list that is to be configured. "CONNECTED" should pop up in the Response box in the Selection area.

11. Enter the password **Administrator** (the password should be entered as shown with A in upper case and the remaining letters using lower case)Click on **Enable**. The angle indicator will move to the current electrical downtilt setting for the antenna.

Important Note:

Every time the Connect button is used, you must also click the Enable button. If this is not done, errors are likely to result when reading or saving settings in the RET.

12. Click the **Settings** tab (located at the top of the screen). At the bottom of the screen, click on **ALL** and then click on **GET**. This will populate the **Antenna Data** section of the screen with information that was programmed into the antenna at the factory (including model number, serial number, frequency, gain, and the maximum and minimum tilt settings). The **Operator** data section will be blank and should be filled in with the information that was recorded on the Installation Configuration sheet in Step 1 (Figure 2).

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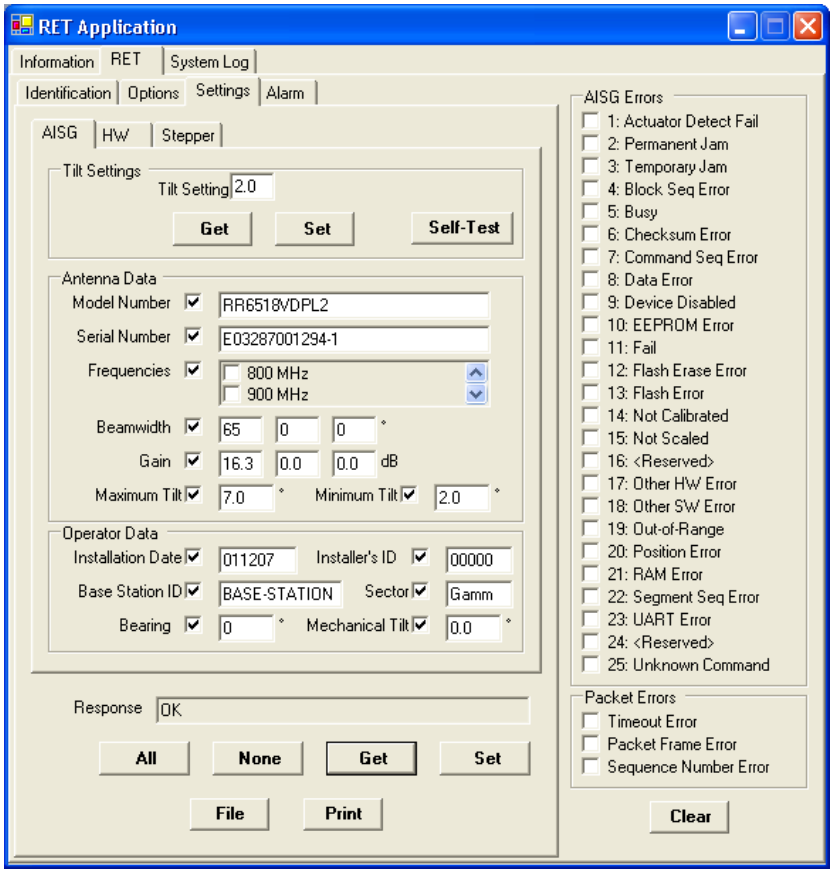

Figure 2. Configuring Site Information into the PWR-COBRA Interface for a RET Antenna.

13. To store data in the **Operator Data** fields, use the information gathered during installation and also enter the Installation Date, Installer's Identification (this can be the company or the individual name), Base Station ID, Sector, Bearing, and the amount of mechanical downtilt set on the antenna during the installation. Once this information is entered, click on **SET** to save this information to the flash memory at the antenna. Repeat this step for each antenna located on the tower until all parameters are complete.

14. To set the electrical downtilt for each antenna actuator, first double click on the first antenna **serial number** shown in the **Vendor/Serial Number** box on the **Identification** screen. Enter the **password** (the password should be entered using lower case letters), and then click on **Connect** and **Enable**. The **Response** window should display CONNECTED. Select the **Settings** tab then the **AISG** tab. Enter the desired downtilt in the **Tilt Setting** box at the top, then click the **Set** button. Repeat this step until all antennas at the site have the desired electrical downtilt setting. See Figure 2.

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15. After all the antenna actuators have been configured and the downtilt settings have been adjusted to their new values, you may want to generate a record of your work. Go to the **AISG** screen shown in Figure 2 to generate a record (a read only XML file will be generated).

    Double click on the **serial number** of the antenna actuator (on the **Identification** screen) you want to create a record on, and then click on **File** located on the **AISG** tab screen. The software will prompt you for the location you wish to store the file on your computer and for a filename. Typically, the file is named after the site the antennas are installed on (e.g. GA12345 or TX345). After saving this file, you will then return to the **Identification** tab where you can repeat this process with the remaining antenna actuators listed. Each time you click on **File** you will be asked *Do you want to replace this*, click **Yes** (this will add the new serial number into the file and will start compiling a list.) Figure 3 shows an example of a file generated using the process described in this step. These files (XML format) can be opened/viewed through an Internet browser (Microsoft Internet Explorer).

```
<?xml version="1.0" encoding="utf-8" ?>
- <Antenna>
- <Settings ID="EM12033901DWDV">
<Field Name="Date" Value="Wed, 12 Nov 2008 15:33:10 GMT" />
<Field Name="Tilt" Value="2.0" />
<Field Name="RET Software Version" Value="V2.3.1 [Build 02Nov07]" />
<Field Name="Antenna Model" Value="RR6518VDPL2" />
<Field Name="Antenna Serial Number" Value="E03287001294-1" />
<Field Name="Antenna Frequency Bands" Value="16" />
<Field Name="Antenna Beamwidth (1)" Value="65" />
<Field Name="Antenna Beamwidth (2)" Value="0" />
<Field Name="Antenna Beamwidth (3)" Value="0" />
<Field Name="Antenna Gain (1)" Value="16.3" />
<Field Name="Antenna Gain (2)" Value="0.0" />
<Field Name="Antenna Gain (3)" Value="0.0" />
<Field Name="Maximum Downtilt Angle" Value="7.0" />
<Field Name="Minimum Downtilt Angle" Value="2.0" />
<Field Name="Installation Date" Value="011207" />
<Field Name="Installer Identifier" Value="00000" />
<Field Name="Base Station Identifier" Value="BASE-STATION" />
<Field Name="Sector Identifier" Value="Gamm" />
<Field Name="Antenna Bearing" Value="0" />
<Field Name="Installed Mechanical Tilt" Value="0.0" />
<Field Name="Vendor Identifier" Value="EM" />
<Field Name="Controller Model Number" Value="ACT_COBRA_3" />
<Field Name="Controller Serial Number" Value="12033901DWDV" />
<Field Name="Controller Identifier" Value="610198-3S" />
<Field Name="RS-485 Termination" Value="false" />
<Field Name="Number of Stepper Motors" Value="1" />
<Field Name="Potentiometer Scaling" Value="612" />
<Field Name="Shaft Gear" Value="40" />
<Field Name="Stepper Motor Resolution" Value="200" />
<Field Name="Worm Resolution" Value="1" />
<Field Name="Number of Smoothing Samples" Value="8" />
<Field Name="Left-Side Orientation" Value="false" />
<Field Name="Calibration Current Limit" Value="290" />
```

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```
<Field Name="Stepper Current Limit" Value="310" />
<Field Name="Current Sample Duty Cycle" Value="35" />
<Field Name="Stepper Pulse Frequency" Value="500" />
<Field Name="Lower Position" Value="369" />
<Field Name="Center Position" Value="537" />
<Field Name="Present Sweep Count" Value="0" />
<Field Name="Upper Position" Value="706" />
<Field Name="Present Mechanical Position" Value="706" />
<Field Name="Mechanical Span" Value="101.4" />
<Field Name="Temperature (deg C)" Value="29.0" />
<Field Name="Minimum Temperature (deg C)" Value="23.4" />
<Field Name="Maximum Temperature (deg C)" Value="29.0" />
<Field Name="Motor Voltage (V)" Value="29.938" />
<Field Name="Minimum Motor Voltage (V)" Value="15.392" />
<Field Name="Maximum Motor Voltage (V)" Value="29.938" />
<Field Name="3.3V Logic Voltage" Value="3.328" />
<Field Name="3.3V Minimum Logic Voltage" Value="3.324" />
<Field Name="3.3V Maximum Logic Voltage" Value="3.333" />
  </Settings>
  </Antenna>
```

Figure 3. Site Report File Viewed Using Internet Browser.

For the following Andrew Antennas, Andrew recommends no more than 130 meters of total data cabling to the last actuator.

MB72RR80VDPALQ_R12	MB72RR65VDPALQ_R12
MB48RR80VDPALQ_R12	MB48RR65VDPALQ_R12
RR6518VDPL2_R	RR9017VDPL2_R
RR6518VDUL2_R	RR3320VDPL4_R
RR6513VDBL2-R	RR9012VDBL2-R

Multiple homerun cables can be used for very demanding installations. Note that for 15 inch COBRA actuators, Andrew recommends a homerun cable be used for each sector with a maximum of 3 antennas on a sector.

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WARRANTY NOTICE

Proper installation, procedures must be followed when installing and operating RET equipment. Failure to assure installations are done by properly trained installation personnel and follow Andrew's documented procedures may cause warranty for such products to be void.

Andrew requires that all RET installations be pre-tested and configured prior to installation. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.

SAFETY NOTICE

The installation, maintenance, or removal of an antenna requires qualified, experienced personnel. Andrew installation instructions are written for such installation personnel. Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance, and condition of equipment.

Andrew disclaims any liability or responsibility for the results of improper or unsafe installation practices.

Do not install near power lines. Power lines, telephone lines, and guy wires look the same. Assume any wire or line can electrocute you.

Do not install on a wet or windy day or when lightning or thunder is in the area. Do not use metal ladder.

Wear shoes with rubber soles and heels. Wear protective clothing including a long-sleeved shirt and rubber gloves.

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