Remote Electrical Downtilt

System Handbook

Installation Overview and Troubleshooting Guide

Visit the Andrew tab on the Andrew Solutions website at www.andrew.com to download latest firmware (software) and antenna definition file before initial installation.

Register online to receive e-mail notifications of file updates.

Safety and Warranty Notices

WARRANTY NOTICE

Proper installation procedures must be followed when installing and operating RET equipment. Failure to assure installations are done properly by trained installation personnel and to follow procedures discussed in this bulletin may cause warranty for such products to be void.

Andrew requires pretesting actuators on the ground prior to installation, using the Andrew portable controller and the latest version of the controller software (available online at www.commscope.com/andrew under Products, Antennas, Teletilt® RET System). This will verify proper actuator functionality and also ensure that the latest available actuator firmware release is installed on the actuator. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.

Unauthorized removal of a protective shroud to replace actuators voids the Andrew 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.

It is recommended that transmit power be turned off when the field installation is performed. Follow all applicable safety precautions as shown on this page.

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.

Installation Training Available at Andrew Institute

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Part 3 – Troubleshooting COBRA™ Systems

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Part 1

Teletilt® Products

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Section 1
Teletilt® Overview

1.1 Introduction to Teletilt®

Andrew, A CommScope Company, carries a wide range of RET equipment, known as our Teletilt product line. A variety of RET system configurations are possible using the Andrew Teletilt system components. See Figure 1-1 for an example of the primary components used in a RET system. Figures 1-2 and 1-3 show examples of how the long cable run can be eliminated by using smart bias tees or a combination of a TMA and a bottom smart bias tee.

Example RET cable lengths shown. Coax cables are not shown.

*If the actuators are daisy-chained together and a junction box is not used, it is recommended that an additional ATLP200-001 lightning protection unit be installed at the top of the RET cable run.

Addtional Products:
ATJB200-A01-007 Seven-Way Junction Box
ATGK-001 RET Grounding Kit (used for cable runs over 60m)
602299 Grounding Kit (used for grounding RET components)
**Component includes 602299 grounding kit.

Antenna

① Actuator
ATM200-002

RET Cable Assembly
ATCB-B01-006

② RET Cable Assembly
ATCB-B01-060

*Junction Box **④**
**ATJB200-A01-004

Hanger Kit Accessories
or Cable Ties (40417)

③

BTS Equipment Cabin

Lightning Protection Unit **⑤**
**ATLP200-001

Antenna Controller   RS-232
ATC200-1000
ATC300-1000
ATC200-LITE
ATC200-LITE-USB

Local Control Interface
Not Supplied

RET Cable Assembly
ATCB-B01-002

dc
Power

Ethernet
(10 Base T)

Figure 1-1. Typical RET System Configuration.
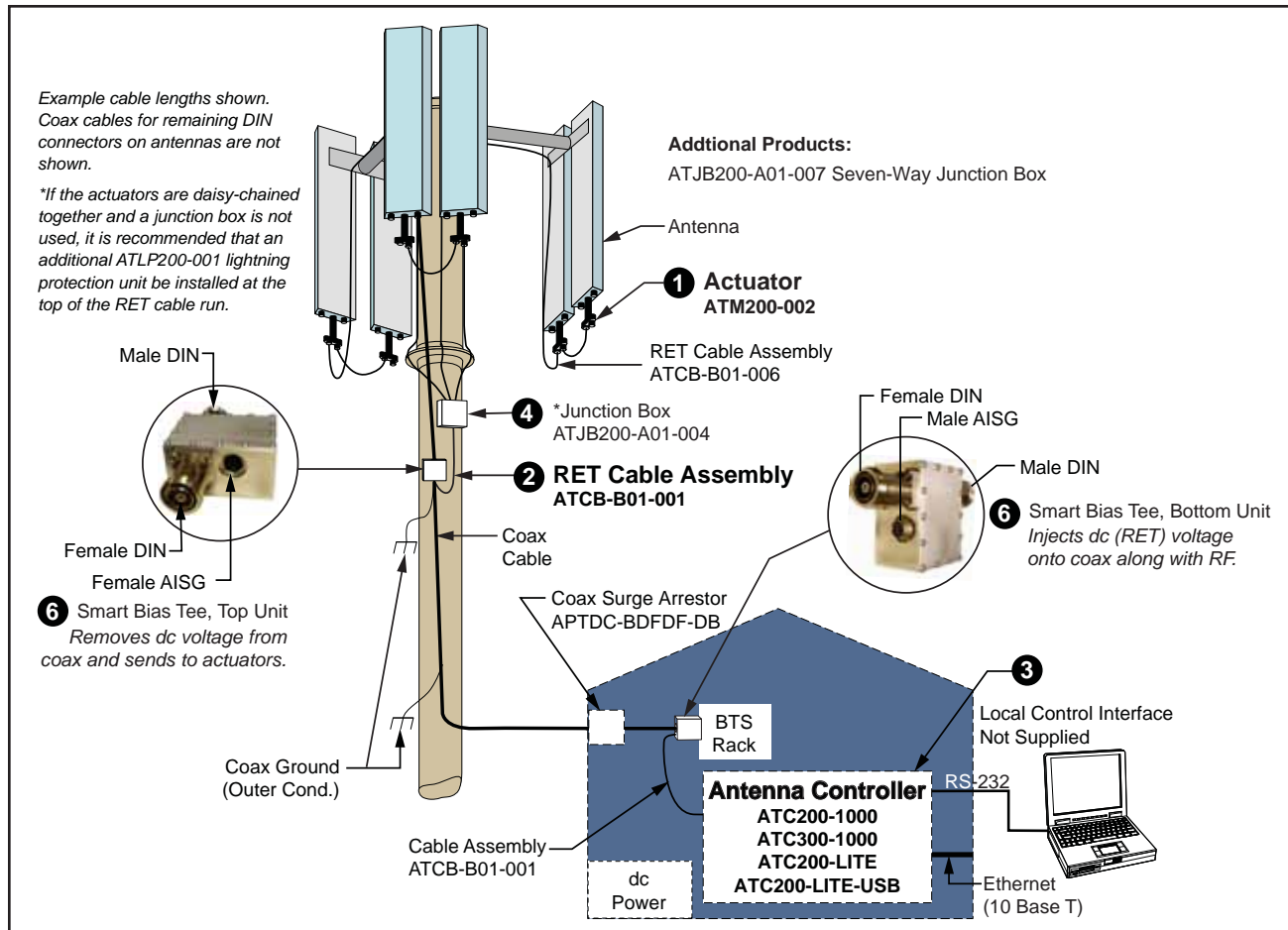
Figure 1-2. RET System Configuration Using Smart Bias Tees.

1.2 RET Component Functions

The product descriptions shown below are numbered in relation to how each component is labeled in Figures 1-1 and 1-2.

❶ Actuator

A motor that tilts the antenna beam by moving a rod, which adjusts the phase relationship among the antenna elements.

❷ RET Cable Assembly

Allows data, tilt commands, and power to be sent to and from the actuator by the controller.

❸ Antenna Controller

Provides an interface, for the user to send commands to the actuator, as well as configure the actuator. The ATC200-LITE and ATC200-LITE-USB controllers are portable. Whereas, the ATC200-1000 and ATC300-1000 controllers are rack mounted at the site and can be addressed to be accessed over a local area network.
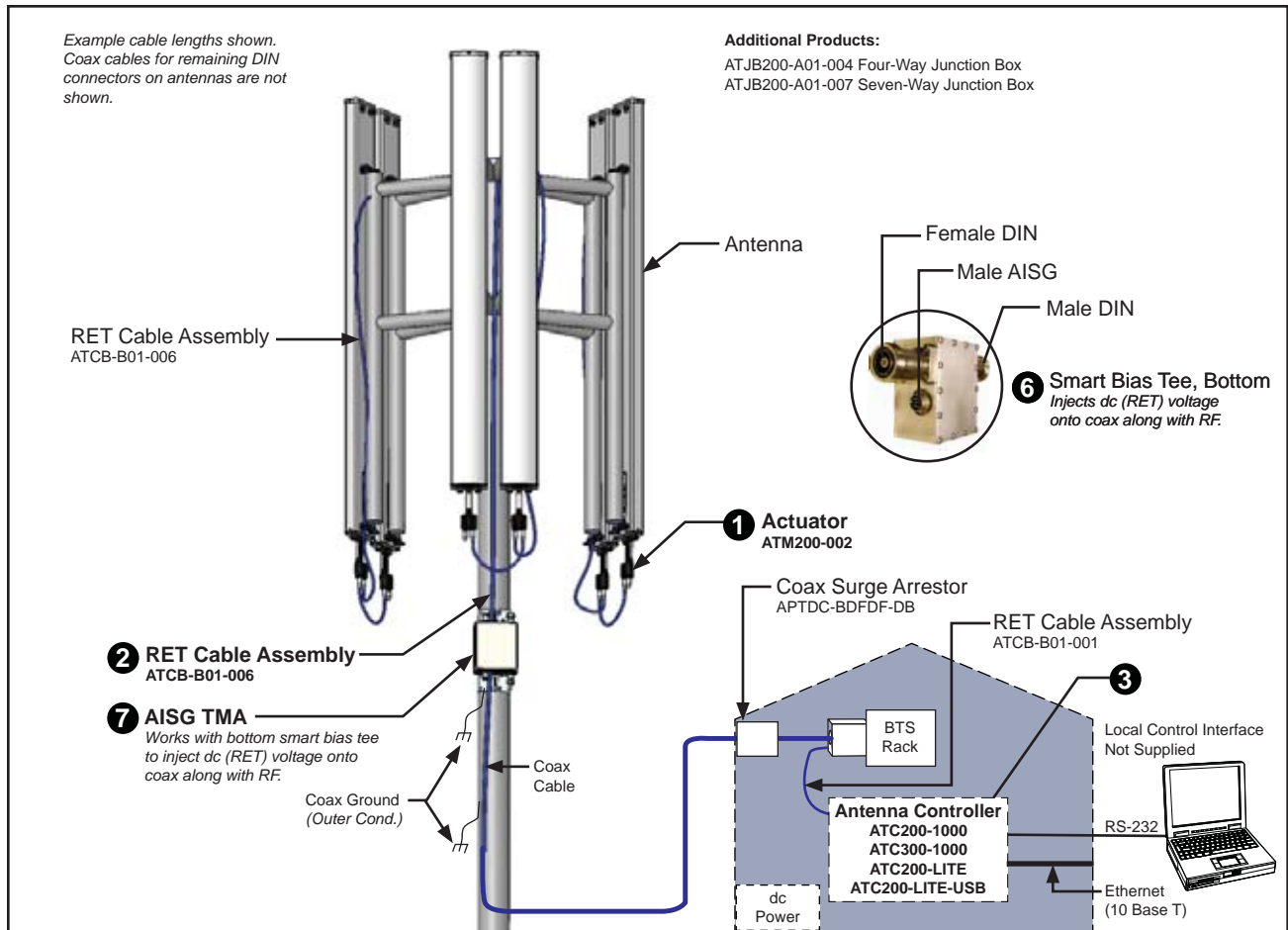
Figure 1-3. RET System Configuration Using a TMA and Bottom Smart Bias Tee.

❹ Junction Box

Simplifies RET cabling and provides lightning protection.

❺ Lightning Protection Unit

Acts as a surge arrestor to protect the controller.

❻ Smart Bias Tee

Allows the controller to pass data and commands over the coax cable and eliminates the need for a long RET cable up the tower.

❼ AISG Tower Mounted Amplifier (TMA)

TMA with integrated smart bias tee allows the controller to pass data and commands over the coaxial cable to a bottom smart bias tee to eliminate the need for a long RET cable up the tower.

1.3 Rooftop RET Configurations

Rooftop configurations with RET equipment are possible. For example, each wall could have an antenna with an actuator. A RET cable can be run from each actuator to a junction box; and then a longer RET cable can be run from the junction box to the controller. Accessories (e.g. grounding kits, lightning protection units, etc.) can be added, as needed. See Figure 1-4 for a simplified diagram example.
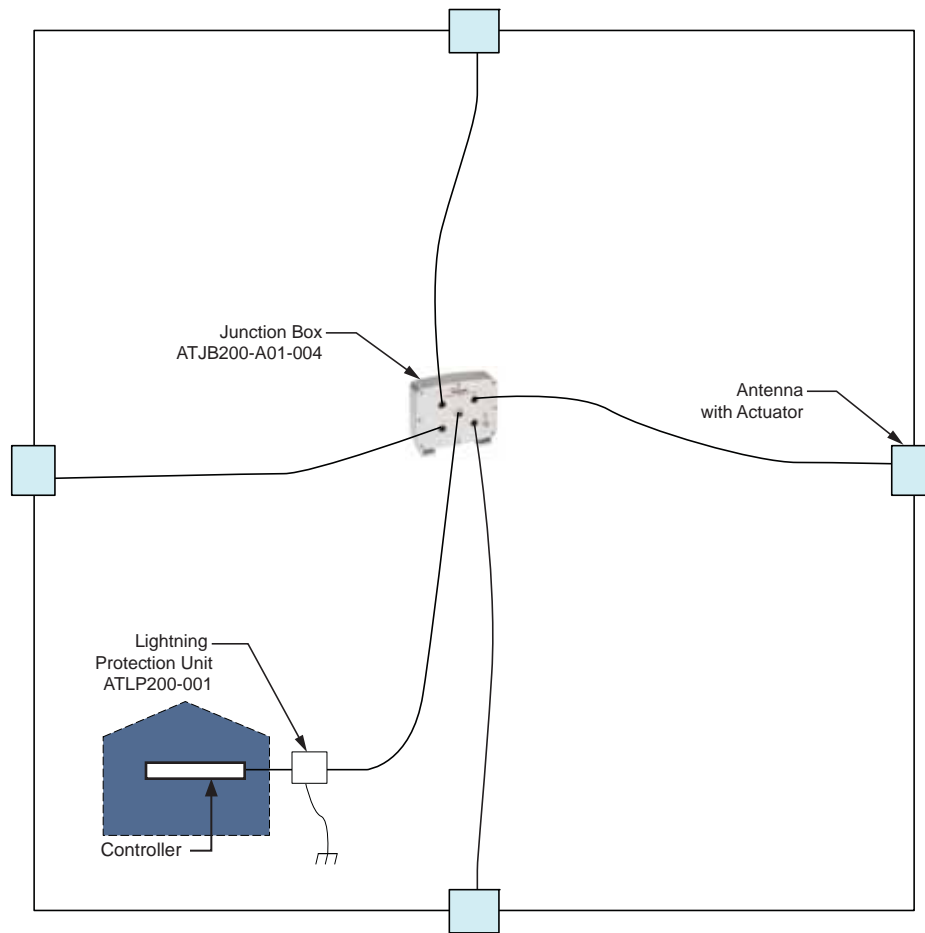
Figure 1-4. Rooftop RET System.

Section 2
Teletilt® RET System Components In Detail

2.1 Actuator (Motor Drive)

ATM200 series actuators house a brushless stepper motor system. This system enables communication from both the actuator to the controller (identifying its position and angular tilt setting) and the controller to the actuator (to make angular tilt adjustments). The brushless approach was adopted for high reliability and low EMI.

The actuator can be fitted on a Teletilt compatible variable electrical downtilt antenna in service or before antenna installation. Installation of the retrofitting actuator to an antenna in service usually does not require antenna realignment or disconnect of the main feeder cabling. This feature allows the operator maximum flexibility to observe a site. Andrew's current ATM200-002 and ATM200-A20 actuators supersede ATM200-001. All actuators can move the full range in less than 25 seconds.

Figure 2-1. ATM200-001 Actuator (Motor Drive).

- ATM200-001 is shown in Figure 2-1.
- ATM200-002 is shown in Figure 2-2.
- The ATM200-A20 is similar in appearance to ATM200-002.
- The E-ATM300 is not shown. This actuator uses the Ericsson proprietary protocol.

When installing an actuator to an antenna, verify the following:

- Actuator should be set at the angle shown on the fully extended downtilt rod.

- Actuator has not been damaged.

Figure 2-2. ATM200-002 Actuator (Motor Drive).

- Locking nut, washer, and AISG cable area are hand tightened.

- Maximum tilt is displayed in the center of the tilt viewing window after installation.

- Several antenna models will show the minimum tilt instead of the maximum tilt:

   TMZXX-6516-VTM, -R2M, -A2M
   TMZXXX6516-VTM, -R2M, A3M
   HBXXX-6516DS-VTM, -R2M, -A3M

Warning!
Over tightening the AISG cable connection to the actuator can damage the actuator's internal PC board. See Figure 2-3 for examples of a good and a damaged AISG connector on the actuator. The AISG connector key should always face inward towards the center of the actuator. AISG cables are to be hand tightened only.
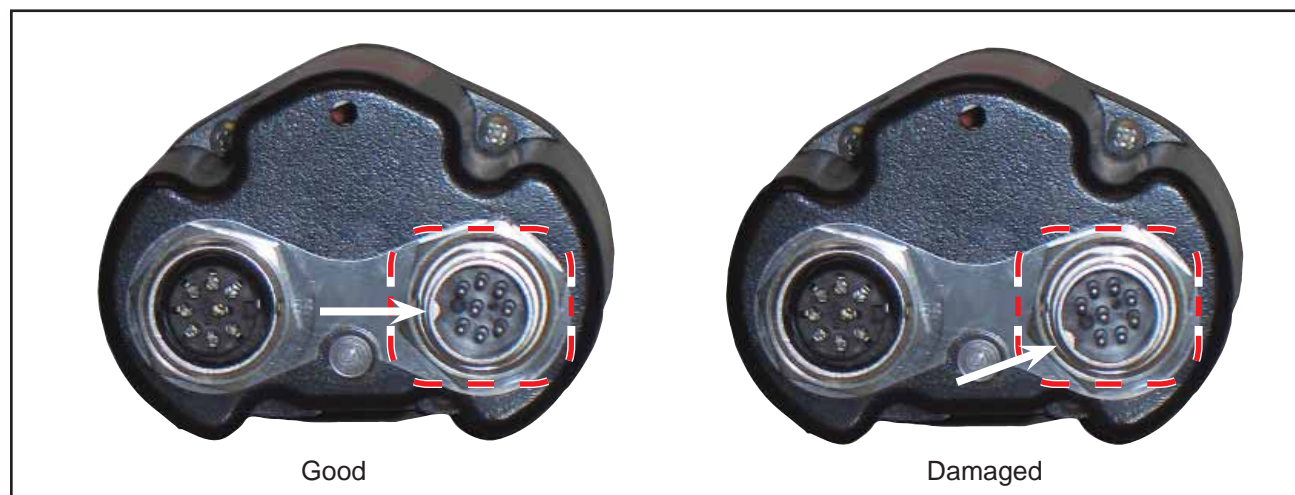
Figure 2-3. Examples of Good and Damaged Actuators.

2.1.1 Actuator Operating Modes

The actuator operating mode as set at the factory is shown in Table 2-1. Most actuators can support all available modes which can be changed in the field using either the ATC200-LITE-USB or ATC300-1000 controller.

The suffix of an antenna indicates the operating mode of factory-installed actuators. 'x' in the serial number indicates the number of actuators on the antenna. See Table 2-1

Actuator	Serial Number Type	Factory-set Protocol	Protocol Support	Suffix*
ATM200-001	All	AISG 1.1	AISG 1.1	none
ATM200-002	0000Cxxxx	AISG 1.1	AISG 1.1	-R2M
ATM200-002	DESAxxxx ASZPxxxx BASBxxxx	AISG 1.1	AISG 1.1, AISG 2.0, and Ericsson	-R2M
ATM200-A20	ALL	AISG 2.0	AISG 1.1, AISG 2.0, and Ericsson	-AxM
E-ATM300	ALL	Ericsson Proprietary	AISG 1.1, AISG 2.0, and Ericsson	-ExM

* Part number suffix for antennas with factory-installed actuators.

Table 2-1. Actuator Modes and Antenna Suffixes.

2.2 AISG RET Control Cabling

Andrew's RET control cabling (Figure 2-4) is compliant to AISG standards and is offered in a wide variety of lengths. Each cable has a male and a female 8–pin circular connector. These AISG compliant connectors have locking screw–rings and are keyed to provide a matching fit with the ports on the actuator, controller, and other RET devices.

Each pin is capable of supporting 5 amps. Four-way and seven-way junction boxes (Section 2.3) with AISG compliant connectors are also available to enable up to 32 devices to be linked to the controller using the AISG compliant RET control cabling.

See Figure 2-5 and Table 2-2 for AISG connector pin definitions. Refer to Table 2-6a for available cable lengths and their part numbers, as well as Andrew RET component part numbers.

<p style="text-align:center">**Warning! Cable should never be cut to change genders.**</p>

ATCB-B01
RET Control Cable

ATCB-B01-R50
RET Control Cable
Jumper with Right Angle
Connector
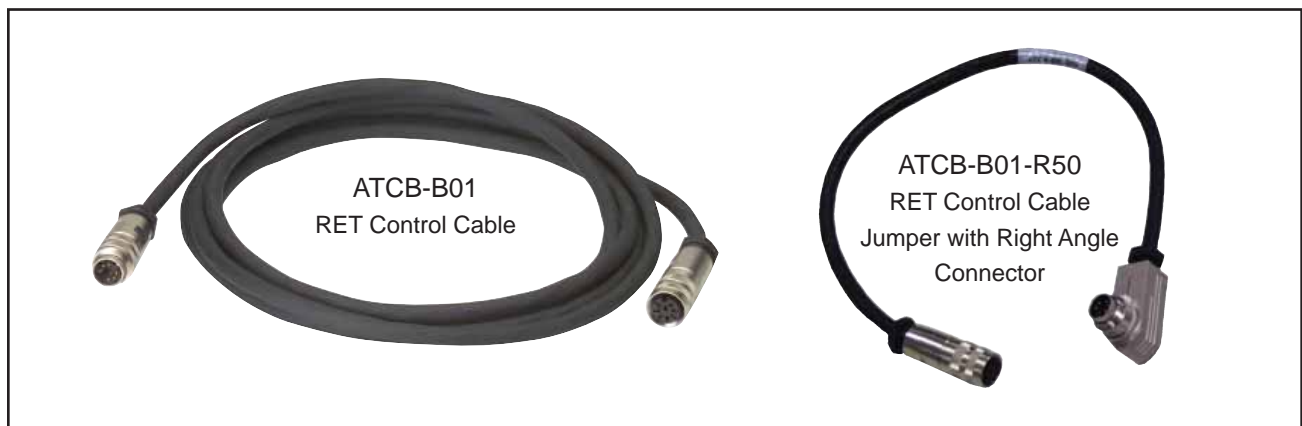
Figure 2-4. ATCB-B01 Series AISG RET Control Cables.

The male connector should be attached towards the bottom end (component output side), and the female connector should be attached at the top end (component input side). No weather proofing is required. Connectors should only be hand tightened.

Keys to ensure proper connection.

Male

Female
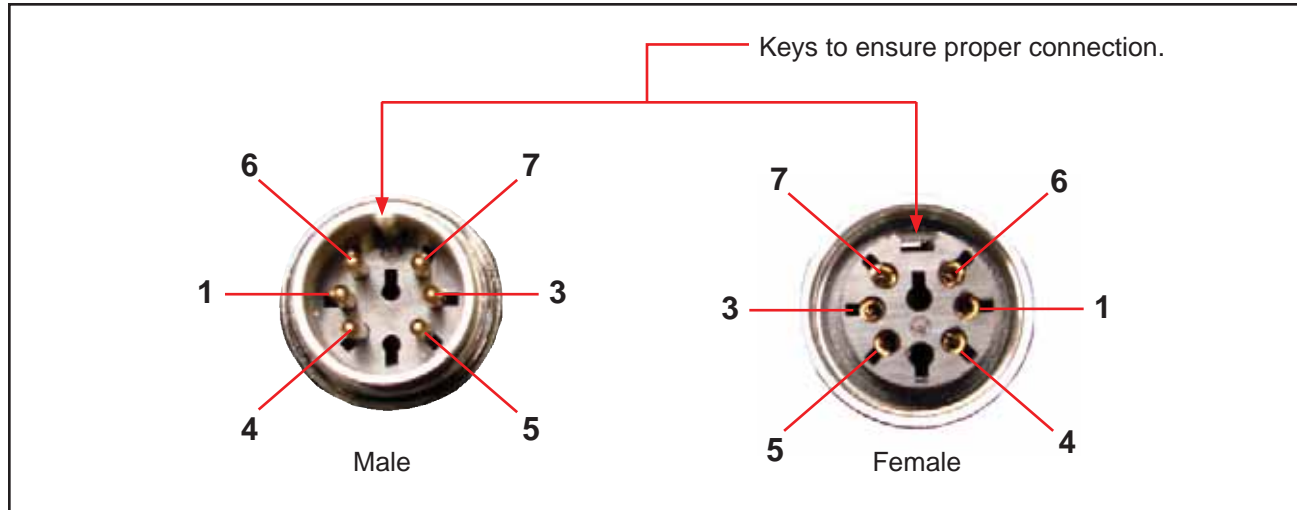
Figure 2-5. AISG Compliant Andrew RET Connector Pin Assignments.

Pin Number	Signal	Comments
1	+12V dc nominal	+10V to 15V dc (optional in AISG 2.0)
2	–48V dc nominal	Use is optional. Not used in the Andrew RET system.
3	RS–485 B	RS–485 communication
4	RS–485 GND	Use is optional. Isolated from dc return and ground.
5	RS–485 A	RS–485 communication
6	+24V dc nominal	+19V to 30V dc (AISG 1.1) / +10V to 30V dc (AISG 2.0)
7	dc return	Not grounded for RET units.
8	N/C	Reserved for future use. Not used in the Andrew RET system.

Table 2-2. AISG Compliant RET Connector Pin Definitions.

2.3 Junction Boxes

Andrew's four–way and seven–way junction boxes are used to de-vide or split the AISG bus, e.g. one cable line per sector. The ATJB-00-A01-004 four-way junction box has 1 input port and 4 output ports and the ATJB200-A01-007 seven-way junction box has 1 input port and 7 output ports. Both the four–way and seven–way junction boxes are pipe or wall/flat surface mountable (mounting brackets are included). These units also provide additional lightning protection. See Figure 2-6.

Figure 2-6. ATJB200-A01-004 Four–Way Junction Box.

2.4 Lightning Protection Unit

The lightning protection unit, ATLP200-001, is recommended to provide added surge protection to any RET device, especially rack mount controllers. This unit must be grounded using the 602299 grounding kit. It has 8–Pin male and female interfaces to feed data and power through the AISG compliant RET control cable. See Figure 2-7.

2.5 RET Cable Grounding Kit

As part of a system, RET cabling requires grounding and line protection at the bottom of the tower with the use of an ATLP200-001 lightning protection unit or ATJB200-A01 series junction box. Andrew also recommends the use of the ATGK-001 grounding kit for every 60m of AISG RET control cable run.

The ATGK-001 grounding kit is designed to capture and ground the cables at the junction where two cables are daisy-chained. This means that for a 120 m run, you will use two 60 m cables (ATCB-B01-060) with the ATGK-001 grounding kit in the middle. Kit includes a clamp module, a ground cable, and hardware for connection to the main ground bus.

Note: AISG control systems need to be grounded at one of these locations:

1. On the top of the site, grounding either the top SBT, TMA, junction box, or using the ATGK-001 RET cable grounding kit.

2. At the bottom of the site, grounding either the bottom SBT, junction box, lightning protection box, the dc 2.1 bias tee, or using the ATGK-001 RET cable grounding kit.

3. Grounding every 60 m for the cable length using the ATGK-001 RET cable grounding kit.

2.6 RET Equipment Grounding Kit

The 602299 grounding kit provides grounding of a RET component, e.g. controller, lightning protection box, junction box, smart bias tee, etc.

*Figure 2-7. ATLP200-001
Lightning Protection Unit.*

Grounding Lug
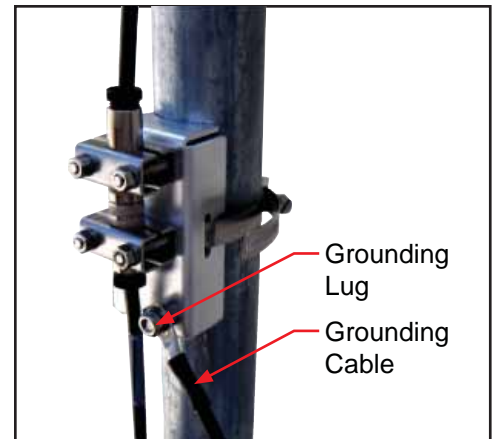
Grounding Cable

*Figure 2-8. ATGK-001
RET Control Cable Grounding Kit.*

*Figure 2-9. 602299
RET Equipment Grounding Kit.*

2.7 AISG Smart Bias Tees

The AISG smart bias tees (Figures 2-10a and 2-10b) are designed to eliminate the long AISG data cable run from the base to the top of a cell site tower by electronically injecting (piggy-backing) power and control signals onto an existing RF coaxial run. Each installation requires a pair (top and bottom unit) of smart bias tees. The top unit is installed at the top of the tower, below the Teletilt RET (remote electrical tilt) devices. The bottom unit is installed at the base of the tower.

Each unit is equipped with a grounding stud that requires use of a 602299 grounding kit to provide additional lightning protection.

ATBT series smart bias tees shown in Figure 2-10a are AISG 1.1 compatible; whereas, the ATBT-S series shown in Figure 2-10b are both AISG 1.1 and 2.0 compatible. Both smart bias tee families are RoHS compliant.

2.8 Portable Antenna System Controllers

Andrew has two portable antenna system controllers. The discontinued ATC200-LITE controller (Figure 2-11) connects to the PC serial port over an RS-232 serial cable. The ATC200-LITE-USB controller (Figure 2-12) connects to either a USB or a serial port on the PC.

Both units serve as an interface between a local PC/laptop and the ATM200 RET actuator/antenna system.

Both units also provide signal level conversion from RS–232 (used on a PC) to RS–485 (used in ATM200 actuators), as well as power to the actuators that are attached to the antennas.

LEDs on the front panel of these units indicate power and data communication. The power and system status LEDs are green when power is supplied to the RET system. The data LED is green when sending data to the RET system and is usually followed by a tinge of red when receiving data from the RET system. Refer to Figures 2-11, 2-13, and Table 2-3 for LED assignments.

Top Unit
ATBT-TOP-24V

Bottom Unit
ATBT-BOTTOM-24V

Figure 2-10a. ATBT Series AISG 1.1 Smart Bias Tees.

Figure 2-10b. ATBT-S Series AISG 1.1 and 2.0 Smart Bias Tees.
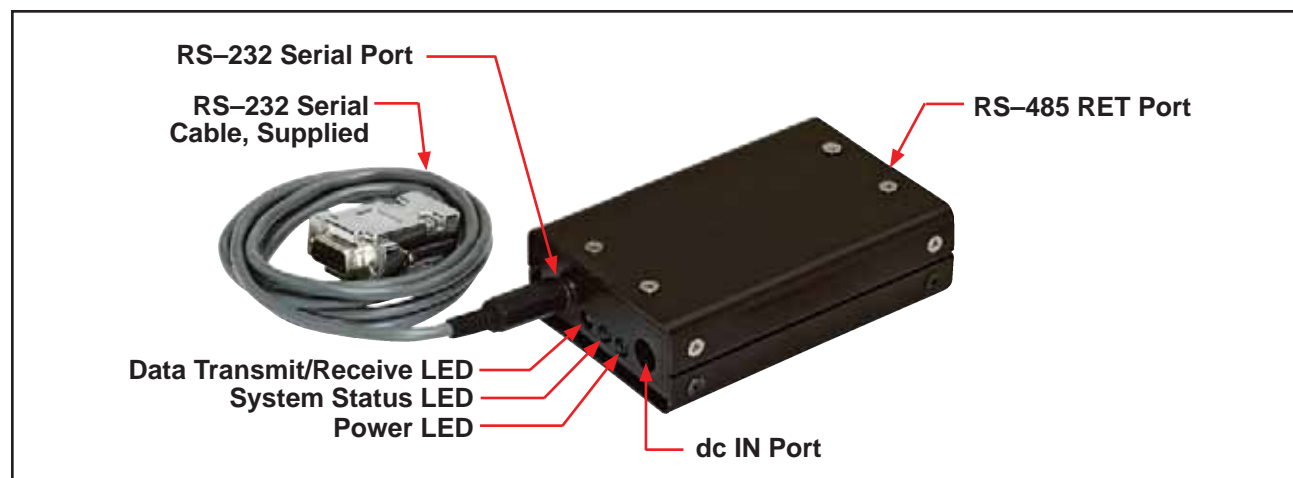
Figure 2-11. ATC200-LITE Portable Controller with RS–232 Serial Cable Attached.

Connection/LED	Comments
RS–232 Serial Port/Cable	Male serial connection attaches to a local PC/laptop. Female adapter plugs into ATC200-LITE controller.
Data Transmit/Receive LED	Blinks alternating green (transmit)/red (receive) lights to show data communication.
System Status LED	Displays green when RET system is OK.
Power LED	Displays green to show power is connected and operational.
dc Port	Connection for +24Vdc power input.
RS–485 Port	Female connection for bottom end of AISG RET control cable.

Table 2-3. ATC200-LITE Controller LED and Connection Reference Chart.
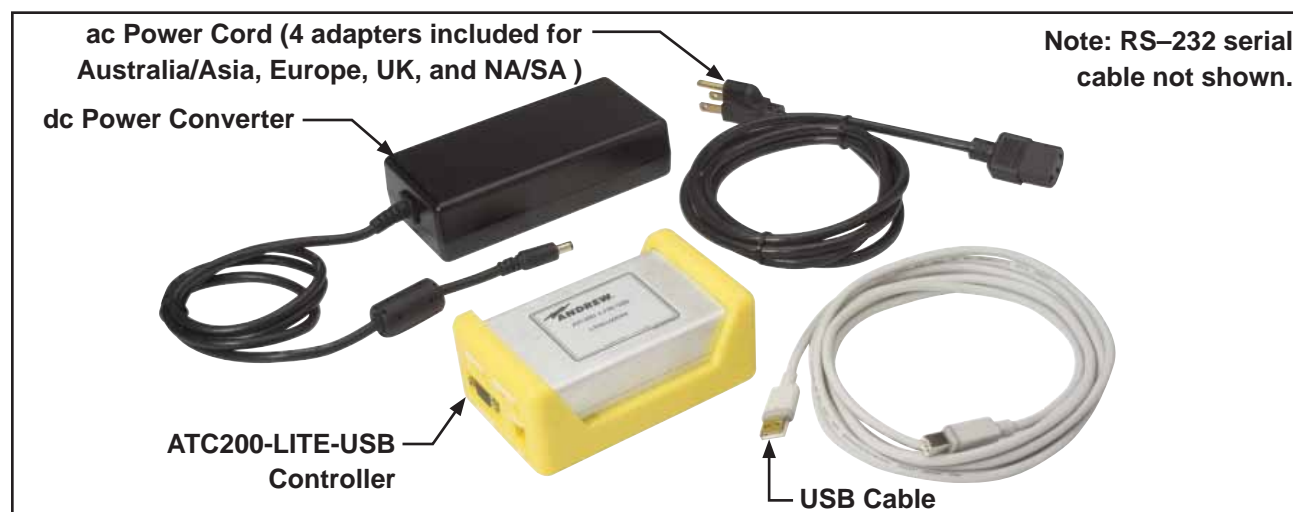
Figure 2-12. ATC200-LITE-USB Portable Controller.

Data LED flashes green on transmitting and red on receiving signals

Power LED is lit when power is input

+12 and
+24 LEDs are lit to show voltage level output

AISG female port for
control cable from antenna

RS-232
Serial Port

dc IN Port

USB Port
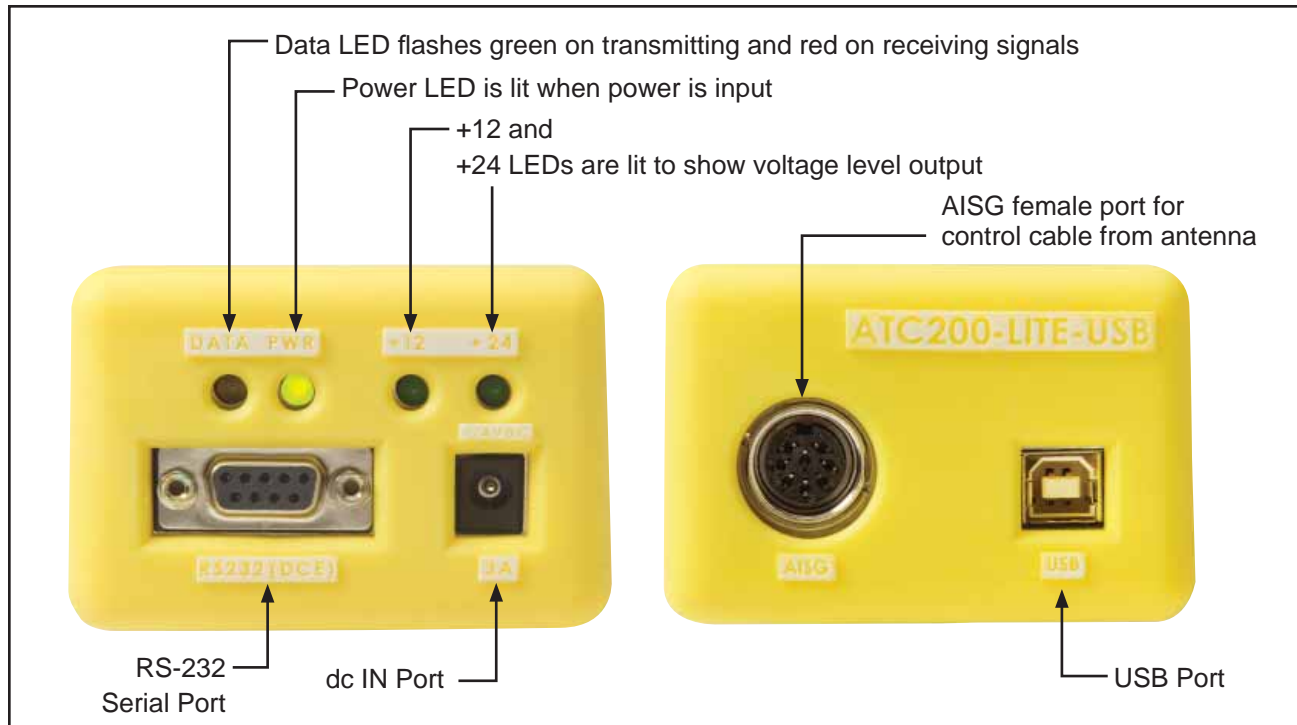
Figure 2-13. ATC200-LITE-USB Controller End Panels.

2.9 Rack Mount Antenna System Controllers

Like the portable controllers, rack mount controllers serve as an interface between a PC/laptop and the actuator/antenna system. Generally, the rack mount controller is installed to reside permanently on-site. These controllers can be operated using a standard Internet browser to facilitate remote access from the network operations center. Additionally, the antenna network management system (ANMS™) can be used to remotely control whole clusters of sites. A rack mount controller must have SNMP configuration for access to the operations center network. See Figures 2-14 and 2-15, and Tables 2-4 and 2-5.

LMT
Port

Status
LED

Ethernet
Port

Female
AISG RET
Port

dc
Port

ac
Port
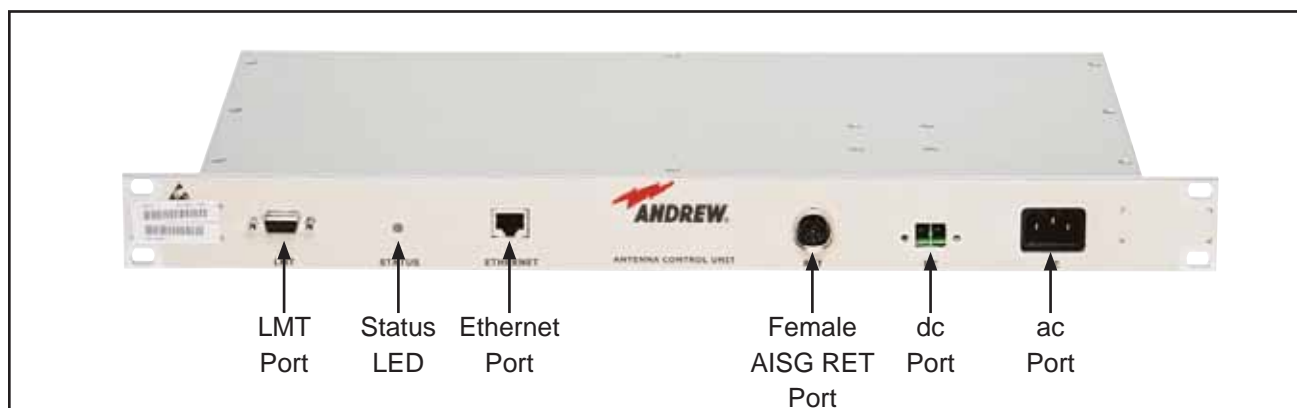
Figure 2-14. ATC200-1000 Antenna System Controller.

Connection/LED	Comments
LMT Port	9–pin 'D' style port for connecting to local PC/laptop RS–232 serial port.
Status LED	Displays red when alarmed. Displays green when system is OK.
Ethernet Port	Used for connecting to local PC/laptop Ethernet port or to a network.
RET port	Used for connecting to bottom end of AISG compliant RET control cable.
dc Port	Connection for –48 Vdc power input.
ac Port	Connection for 110 Vac power input.

Table 2-4. ATC200-1000 Controller LED and Connection Reference Chart.
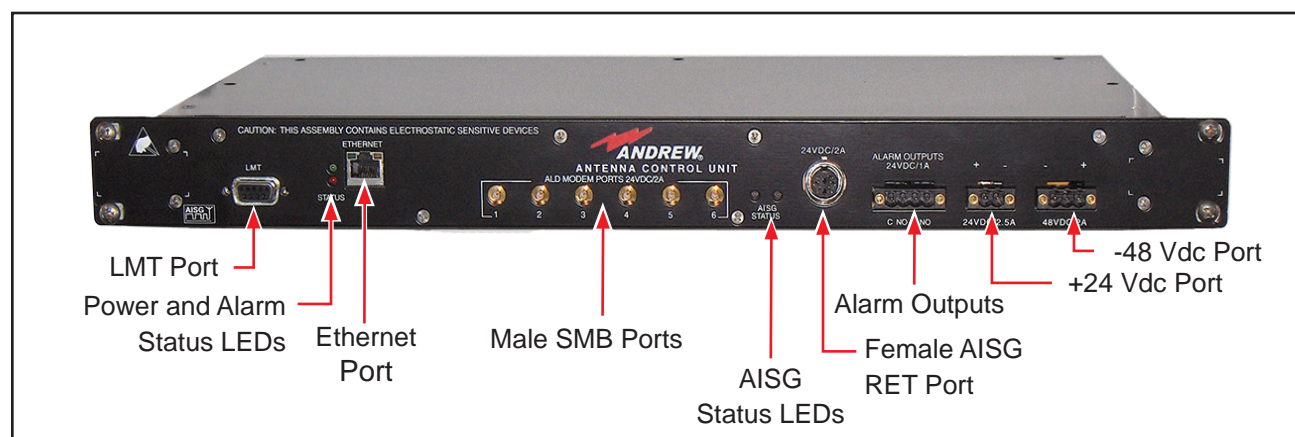
Figure 2-15. ATC300-1000 Antenna System Controller.

Connection/LED	Comments
LMT Port	9–pin 'D' style port for connecting to local PC/laptop RS–232 serial port.
Ethernet Port	Used for connecting to local PC/laptop Ethernet port or to a network.
SMB Ports	Six 50 ohm SMB jacks used to connect SMB coaxial cables to bias tees.
AISG Status LEDS	Displays red when alarmed. Displays green when system is OK.
RET port	Used for connecting to bottom end of AISG compliant RET control cable.
Alarm Outputs	Two relay outputs for conveying alarm conditions.
-48 Vdc Port	Connection for –48 Vdc battery power input.
+24 Vdc Port	Connection for +24 Vdc power input.

Table 2-5. ATC300-1000 Controller LED and Connection Reference Chart.

2.10 ATTK200-KIT Control Cable and System Test Kit

The ATTK200-KIT cable testing kit includes three diagnostic tools to assist in troubleshooting problems that can occur in a RET system.

• Cable tester, provided to perform diagnostic testing on RET cabling

• RET system tester, provided to troubleshoot problems within a RET system

• Breakout box, exposes internal cable wiring without cutting a cable

Cable Tester (ATTK-SB, ATTK-LU)
The cable tester consists of two units (switch box and LED unit) to locate shorts, opens, and wiring errors for AISG RET cabling. It is designed to test all cable lengths–long and short. The switch box attaches to the device end of the RET cabling (up on the tower), and the LED unit attaches to the controller end of the RET cabling (at the bottom of the tower). See Figure 2-16.

Figure 2-16. ATTK-SB and ATTK-LU Cable Tester Units.

System Tester (ATTK-SA)
The system tester is designed to check for opens, shorts, high voltage, low voltage, and data levels per the AISG standard system using color-coded LEDs. See Figure 2-17.

Figure 2-17. ATTK-SA System Tester Unit.

Breakout Box (ATTK-BB)

The breakout box enables short or open conditions on the individual AISG RET control cable without cutting into the cable. See Figure 2-18 for breakout box features.
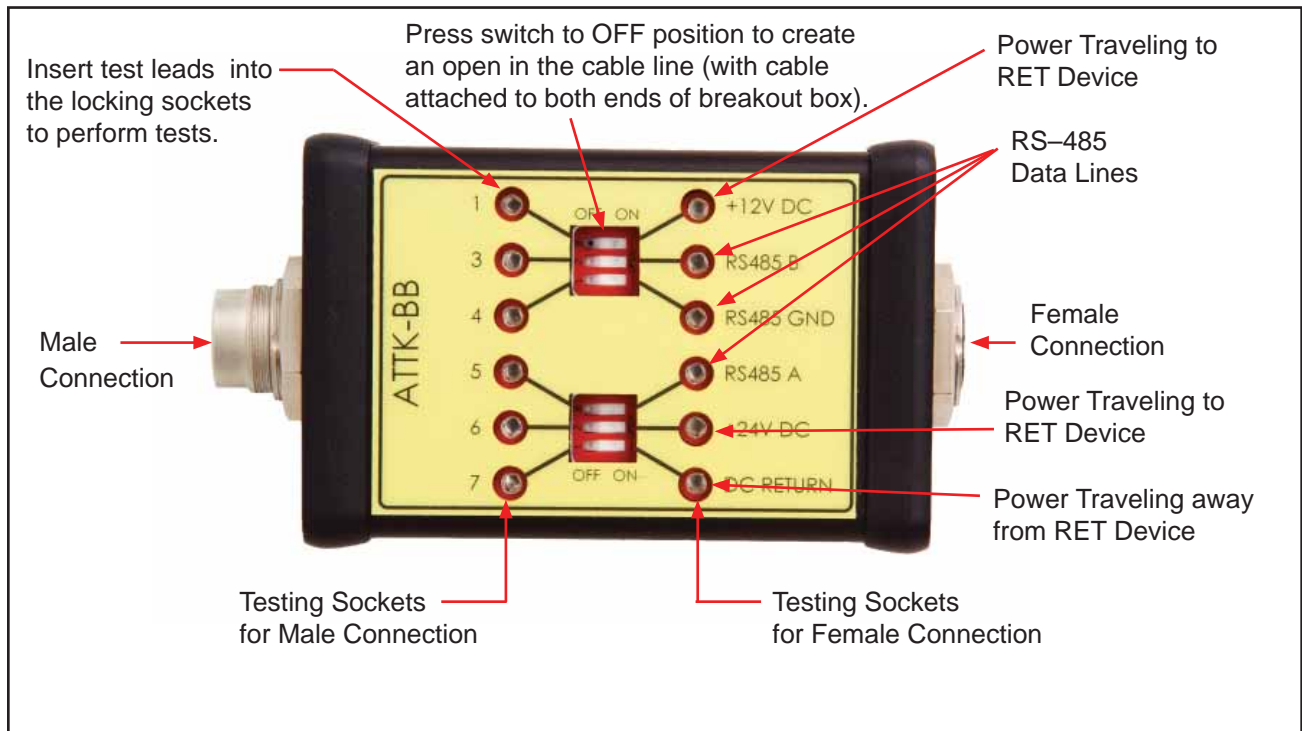
Figure 2-18. ATTK-BB Breakout Box Unit.

2.11 Teletilt RET System Component Part Numbers

Teletilt RET system component part numbers are shown in Tables 2-6a and 2-6b.

Part Number	Description	Length
Cables With Right Angle Connectors		
ATCB-B01-RM50	AISG Cable with Male Right Angle Connector	1.6 ft. (0.5m)
ATCB-B01-RF50	AISG Cable with Female Right Angle Connector	1.6 ft. (0.5m)
ATCB-B01-RMRF35	AISG Cable with 1 Male and 1 Female Right Angle Connector	1.15 ft. (0.35m)
ATCB-B01-RMRF50	AISG Cable with 1 Male and 1 Female Right Angle Connector	1.6 ft. (0.5m)
AISG Cables		
ATCB-B01-C50	AISG Cable	1.6 ft (0.5m)
ATCB-B01-001	AISG Cable	3.3 ft (1m)
ATCB-B01-002	AISG Cable	6.6 ft (2m)
ATCB-B01-003	AISG Cable	9.8 ft (3m)
ATCB-B01-004	AISG Cable	13.1 ft (4m)
ATCB-B01-005	AISG Cable	16.4 ft (5m)
ATCB-B01-006	AISG Cable	19.7 ft (6m)
ATCB-B01-009	AISG Cable	29.5 ft (9m)
ATCB-B01-010	AISG Cable	32.8 ft (10m)
ATCB-B01-015	AISG Cable	49.2 ft (15m)
ATCB-B01-020	AISG Cable	65.6 ft (20m)
ATCB-B01-030	AISG Cable	98.4 ft (30m)
ATCB-B01-040	AISG Cable	131.2 ft (40m)
ATCB-B01-050	AISG Cable	164.0 ft (50m)
ATCB-B01-060	AISG Cable	196.9 ft (60m)
Cable Kits		
ATCB-B01-070K	AISG Cable Kit: 2 Cables (ATCB-B01-030, ATCB-B01-040) plus 1 grounding kit (ATGK-001)	229.7 ft (70m)
ATCB-B01-080K	AISG Cable Kit: 2 Cables (ATCB-B01-040) plus 1 grounding kit (ATGK-001)	262.5 ft (80m)
ATCB-B01-090K	AISG Cable Kit: 2 Cables (ATCB-B01-040, ATCB-B01-050) plus 1 grounding kit (ATGK-001)	295.3 ft (90m)
ATCB-B01-100K	AISG Cable Kit: 2 Cables (ATCB-B01-050) plus 1 grounding kit (ATGK-001)	328.1 ft (100m)

Table 2-6. Teletilt® RET System Component Part Numbers (continued on following page).

Part Number	Description
Grounding Kits	
ATGK-001	For Control Cable
602299	For RET Equipment
Junction Boxes/Lightning Protection Unit	
ATJB200-A01-004	4–Way Junction Box
ATJB200-A01-007	7–Way Junction Box
ATLP200-001	AISG Lightning Protection Unit
AISG Smart Bias Tees	
ATBT-BOTTOM-24V	24V Bottom; Port 1-M, Port 2-F, Port 3-M*
ATBT-TOP-24V	24V Top; Port 1-M, Port 2-F, Port 3-F*
ATBT-S508	12V Bottom; Port 1-F, Port 2-M, Port 3-M*
ATBT-S509	12V Top; Port 1-F, Port 2-M, Port 3-F*
ATBT-S511	12V Bottom; Port 1-M, Port 2-F, Port 3-M*
ATBT-S522	24V Top; Port 1-M, Port 2-F, Port 3-F*
ATBT-S525	24V Bottom; Port 1-F, Port 2-M, Port 3-M*
ATBT-S526	24V Bottom; Port 1-M, Port 2-F, Port 3-M*
Antenna Tilt Controllers	
ATC200-LITE-USB	Portable Controlling Unit (Serial/USB Connections)
ATC200-1000 (discontinued)	Rack Mount Control Unit (AISG Connection)
ATC300-1000	Rack Mount Control Unit (AISG/SMB Connections)
Antenna Tilt Motor Drive (Actuator)	
ATM200-002	Actuator (1 input, 1 output, AISG 2.0 by default)
ATM200-A20	Actuator (1 input, 1 output, AISG 2.0 by default)
E-ATM300	Actuator (1 input, 1 output, Ericsson proprietary protocol by default)
Diagnostic Kit	
ATTK200-KIT	AISG Cable and RET System Test Equipment
Software	
ANMS™ Site Manager	Antenna Network Management Software for ATC300-1000 and ATC200-1000

*Port 1=7-16 DIN (RF/dc/data); Port 2=7-16 DIN (RF/dc blocked); Port 3=AISG 8-pin (dc/data)

Table 2-6. Teletilt® RET System Component Part Numbers (continued from previous page).

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Section 3
Online Search For Teletilt® RET Installation Bulletins

Andrew provides installation bulletins for all Teletilt® RET products. These bulletins are available online at the Commscope website. This section describes how to obtain installation bulletins online.

See below to locate and download installation bulletins online from the Commscope website:

(http://www.commscope.com/andrew/eng/index.html)

1. From the main Commscope web page, click on **Andrew → Products → Antennas → Teletilt RET System** from the left sidebar (Figure 3-1).
2. Scroll down the Teletilt page, and click on **Components** (Figure 3-1).
3. Click on the link for the product of interest (Figure 3-2).
4. Click on the link provided for **Installation and User Guides** (Figure 3-3).
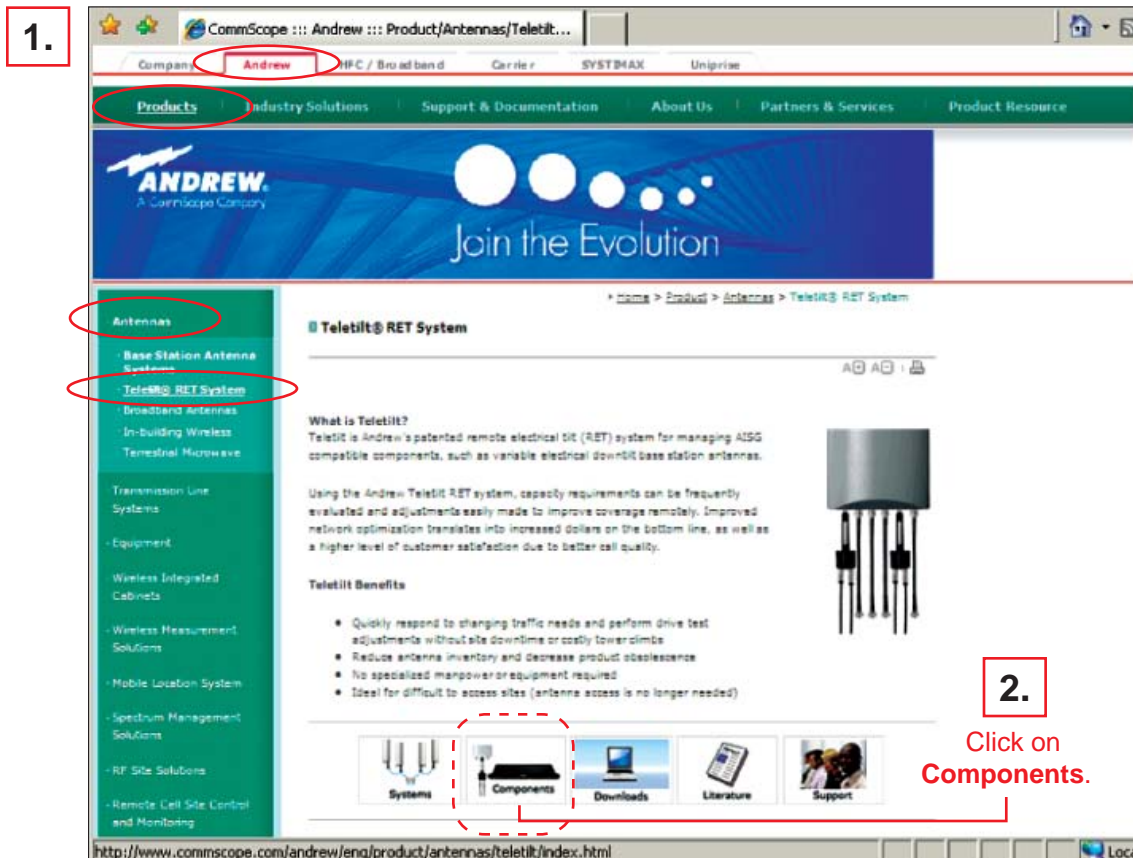
Figure 3-1. Navigating Andrew's Webpage to Find Teletilt Installation Bulletins.

3.
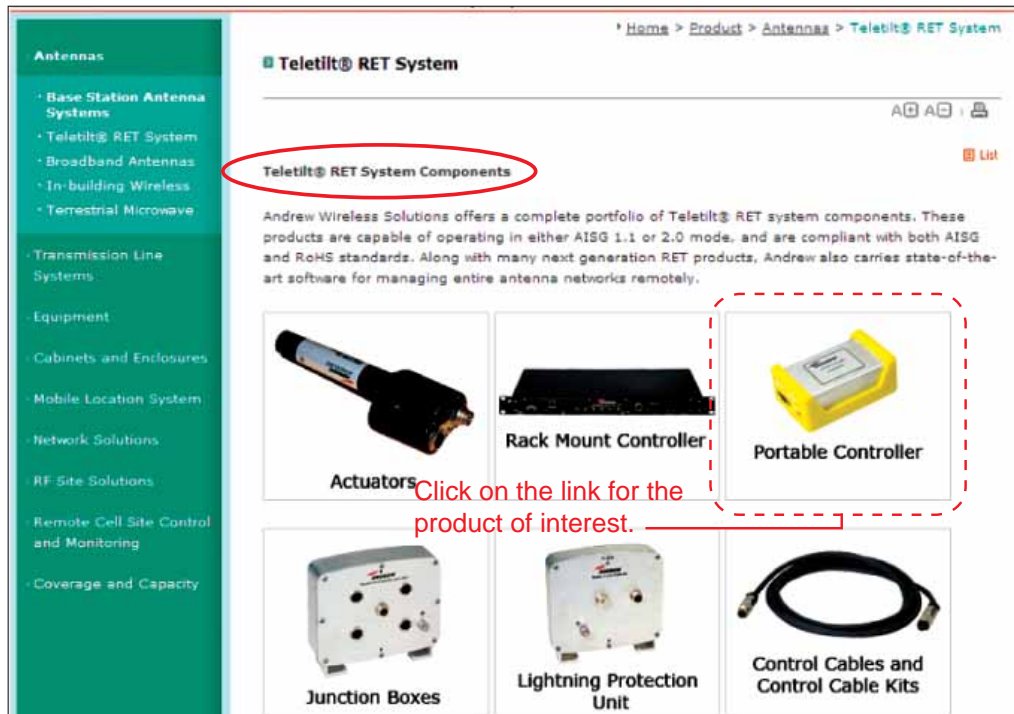
Figure 3-2.   Selecting the Portable Controller Link to Access Installation Instructions.

4.
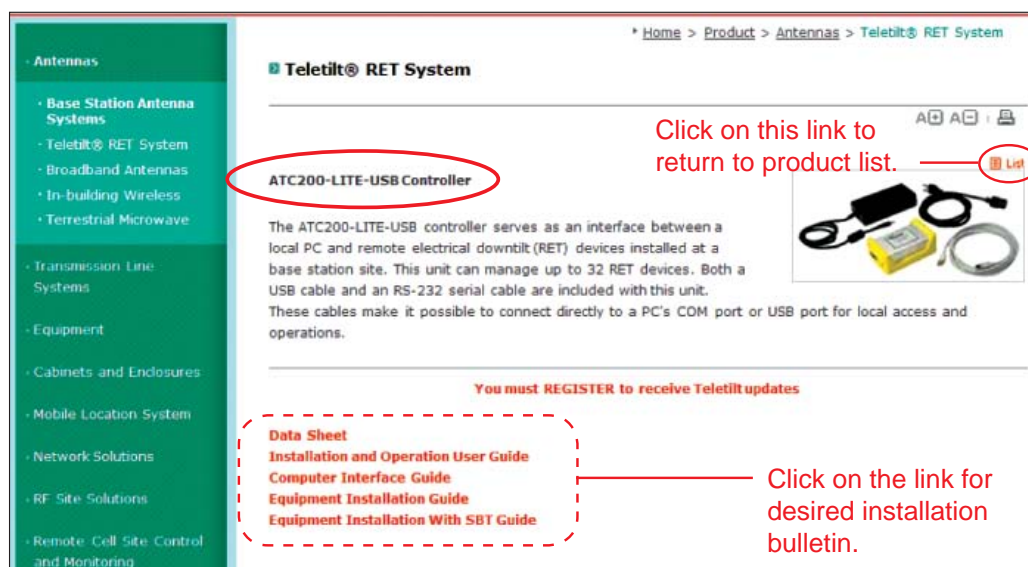
Figure 3-3.   Selecting the Portable Controller Link to Access Installation Instructions.

3.1 Download Teletilt® RET Installation Bulletins.

Right click on the selected product instruction. Click **Save Target As** and locate a folder on your local computer where you wish to save the instruction file. Click on that folder to open it and click **Save**.

Section 4
Pre-Installation Check

Andrew requires pretesting actuators on the ground prior to installation using the Andrew portable controller and the latest version of the controller software (available online at www.andrew.com. Go to Products→Antennas→Teletilt® RET System). This will verify proper actuator functionality and also ensure that the latest available actuator firmware release is installed on the actuator. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.

Suggested steps for checking RET equipment while on the ground:

1. Record antenna serial number and actuator serial number(s) for each antenna. (For antennas with multiple actuators, document frequency band and position of each actuator.)

2. Record sector and position for each antenna and actuator.

   Note that Andrew offers a workpad (ATFK-Config Pad) for recording the information in steps 1 and 2 (Figure 4-1 on the next page). The workpad can be downloaded from the Andrew Solutions website.

3. Connect all equipment together per RET configuration plan for the site. (In the long run, this may be faster than testing components individually.) A short section of coax cable could be used for systems with smart bias tees.

    Note that the controller should be turned off before any connections are made.

    Note that all connections are waterproof and that connections should only be hand-tight (0.5–0.7 Nm or 0.36–0.51 ft-lbs). Over-torquing connectors can destroy connectivity to pins.

4. Use a controller to scan for devices and adjust tilt.

    If all devices are found, the equipment is ready for installation. If there is a failure, see Sections 5 and 6.

ANDREW®

Teletilt® System Site Configuration Worksheet

SITE I.D. [   ]

Actuator	Antenna	Actuator Serial No.	Sector/ Orientation	Height	Miscellaneous
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Figure 4-1. Site Configuration Worksheet.

Part 2

Troubleshooting Teletilt® Systems

Overview of Part 2

Section 5   gives basic guidance for resolving any questions regarding Teletilt® products. This should be consulted first.

Sections 6-12   are devoted to specific Teletilt® product questions. See pages iii to v, the main Table of Contents, for the product in each section and issues related to the product.

Sections 13-16 resolve computer issues.

Section 17   deals with Node-B controllers.

Section 18   deals with interoperability with non-Andrew devices.

Section 19   is a miscellaneous note.

Please see Part 3 for any questions with the COBRA™ RET system

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Section 5
Basic Approach: Isolate and Replace

> When experiencing issues with a factory-installed actuator, Andrew recommends returning the entire antenna with actuator rather than changing the actuator. Proper installation procedures must be followed when installing and operating RET equipment. Failure to assure installations are done properly by trained installation personnel and to follow procedures discussed in this bulletin may cause warranty for such products to be void.

Solving a RET problem does not always require technical expertise. It is often enough to isolate a malfunction and replace the device.

If you <u>find some but not all devices</u>, you can connect directly to the device not found using RET control cables that are known to be good. Rescan. If the device is still not communicating, replace the device. If it starts communicating, add other devices one at a time, rescanning after each device is added, until the error occurs. (For example, the problem could be an output connector of a junction box or an actuator in a daisy chain.)

If you <u>find no devices</u>, by-pass a component (other than an actuator at first) and rescan. Continue eliminating devices until the source of the problem is found. For example, remove the lightning protection unit and connect directly to the home run cable. If failure still exists, bypass the junction box and retest. Continue until you find the malfunction. You can assume that the RET cable is good at first for convenience. However, the RET cable could be the problem.

For cases where you are unable to contact any devices and **smart bias tees** are used:

1. Check that both top and bottom bias tees are installed and that they are installed correctly.
2. Check voltage out of smart bias tee (24 volts or 12 volts dc according to type).
3. Check voltage at end of coax.
4. Use another smart bias tee to eliminate the possibility of a bad modulator.
5. Make sure no device in the RF path will block the 2.176 MHz AISG signal (such as a diplexer) or ground the dc voltage (such as a surge arrestor that does not pass dc voltage).

For cases where you are unable to contact any devices and a **TMA and bottom smart bias tee** are used:

1. Check that both the top TMA and bottom bias tee are installed correctly.
2. Check voltage out of bottom smart bias tee (about 24 Vdc* between center conductor and shell).
3. Check voltage at end of coax (about 22 Vdc* between center conductor and shell).
4. Use another smart bias tee to eliminate the possibility of a bad modulator.

5. Check voltage on AISG port on TMA (about 22 Vdc* between pins 6 and 7).

6. Bypass the SBT and TMA. Use a direct RET cable from portable controller to actuators.

7. If steps 1 through 6 fail, you can move the smart bias tee to the other coax feeding into the other TMA port.

8. If steps 1 through 7 fail, use another TMA to eliminate possibility of a bad AISG component.

9. See Table 2-2 for pin outs.

* Voltages are based on Andrew controller with 24 Vdc power supply.

More specific issues are dealt with in subsequent sections of Part 2.

Section 6
ATM200 Actuator Issues

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1. **Andrew requires pretesting actuators on the ground prior to installation, using the Andrew portable controller and the latest version of the controller software (available online at www.andrew.com under Products→Antennas→Teletilt® RET System). This will verify proper actuator functionality and also ensure that the latest available actuator firmware release is installed on the actuator. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.**
2. **Unauthorized removal of a protective shroud to replace actuators voids the Andrew warranty.**

These instructions are specific to the external actuator such as ATM200-002 or ATM200-A20.

6.1   No Actuators Found

- Verify all RET control cables are correctly connected.
- Bypass first actuator in a daisy chain to see if first actuator is a problem.
- Assure that surge arrestor passes dc (typically APTDC-BDFDF-DB or APTDC-BDFDM-DB).
- Isolate and eliminate good devices in path (Section 5) until problem device is found.
- Check output voltage of smart bias tees and smart TMAs that need to have 10 to 30 Vdc between pins 1 and 6. See Table 2-2 for pin-out.
- Use ATTK200-KIT to test for damaged home run RET cable or jumper, or test using known good cable.
- Check male connector of first actuator in a daisy chain. If key does not point to center of actuator, connector may have been twisted so that pins have no internal contact.

After the checks listed above, see also:

- If using ATC200-LITE-USB, see Section 7.1.
- If using ATC300-1000, see Section 8.1.
- If using SMB ports on ATC300-1000, see Section 9.1
- If using ATC200-1000, see Section 10.1.

6.2   Not All Actuators Found

- Turn off power to controller. Turn on again and rescan to assure correct bus addressing (i.e., all addresses are unique).
- Isolate and verify which actuators function properly (Section 5).

- Daisy chain good actuators one pair at a time to test output connection of actuators.
- Check actuator female connector.
- Isolate and eliminate other devices in cable path until problem device is found (e.g., output connector of junction box, jumper cable).
- If cable path to outmost device exceeds 200 meters and all devices/cables are good, reconfigure the path for shorter cable path.
- Defective TMA (see Section 12) or smart bias tee (see Section 11).
- Verify that surge arrestor, such as APTDC-BDFDM-DB or APTDC-BDFDF-DB, for a sector is not dc ground but passes dc voltage.

6.3 Actuator Reports Permanent Jam

- There is a "temporary" jam which corrects itself.
- A report of a "permanent" jam is a problem.
- If field-installed:
  - Compression ring may still be present.
- Actuator was not attached to downtilt rod correctly (see Instruction Bulletin #639526).
- Actuator was set to incorrect angle when attached to downtilt rod (angle shown in bushing should match angle that the actuator is set for – generally, max tilt angle).
- Remove actuator. Verify antenna is OK by certifying that tilt rod moves freely (about 2-3 lbs. max force) from max to min tilt. Test actuator while detached. If the permanent jam remains, replace the actuator.
- If actuator is factory-installed:
  - Isolate the actuator (i.e. not daisy-chained or connected by a junction box or splitter to another actuator).
  - Retest the actuator
  - If you still get the "permanent" jam, replace the antenna. (See Note 2 at the beginning of this section.)

6.4 Angle Displayed in Antenna Bushing Window Does Not Match Angle Reported by Controller Software

- A mismatch of ±0.1° is not a problem.
- Check that actuator is configured with correct antenna model.
- Field-installed actuator was not set to correct angle before attaching to the antenna.
- Re-attach actuator so that the angle reported by the controller software initially matches the angle displayed in the antenna bushing window.

6.5   Actuator Does Not Move to Max or Min Tilt

- See Section 6.4

6.6   Hardware Error Alarm

- When actuator is repeatedly moved to max/min tilt for many cycles in a short time, the controller temporarily stops movement to prevent overheating. This is a protection, not an error. Allow device to cool for a minute or two and retry.
  If the hardware error alarm still persists, allow the device to cool for <u>ten minutes</u> and try to tilt again. If the alarm still comes up, then there is an internal malfunction and the device needs to be replaced.

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Section 7
ATC200-LITE-USB Issues

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1. **Andrew requires pretesting actuators on the ground prior to installation, using the Andrew portable controller and the latest version of the controller software (available online at www.andrew.com under Products→ Antennas→Teletilt® RET System). This will verify proper actuator functionality and also ensure that the latest available actuator firmware release is installed on the actuator. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.**
2. **Unauthorized removal of a protective shroud to replace actuators voids the Andrew warranty.**

7.1   No USB Connection

- See Section 13 to correct USB driver.

- A USB cable does not work on Vista 64 bit. (If your C drive contains a folder for "Program Files" and a folder for "Program Files X86", you have Vista 64 bit.)
  Use a serial cable instead. If you do not have serial ports on the computer, use a serial to USB adapter. Two preferred sources of the adapter are the Dynex from Best Buy or the Airlink from Fry's. A 64 bit driver for the adapter is also needed.

- Reboot the laptop to see if it will recognize the ATC200-LITE-USB.

- Disconnect and reconnect USB cable to get the laptop to recognize the USB.

- Jiggle the USB cable to make sure it is making contact.

7.2   Tilt Range Incorrect

- Ensure actuator is configured for correct antenna model.

7.3   Tilt Reading Incorrect

- It is alright to have a mismatch of ±0.1° between the angle displayed in the antenna bushing window and the angle reported by the ATC200-LITE-USB.

- Ensure actuator is configured for correct antenna model.

7.4   See Different Number Of Actuators At Different Times

- Install latest software. From the Andrew Products tab on www.commscope.com, click on **Antennas→Teletilt RET System→Downloads→Teletilt RET Products Software, Firmware, Tools, and Manuals.**

7.5   Actuator Cannot Answer Request For Config Information

- Install latest software for ATC200-LITE-USB. Old versions cannot talk to newer firmware on actuators.

7.6   Data Led Stays Red

- An actuator is stuck on transmit. Isolate, verify and possibly replace (Section 5).
- Actuators have same address and are talking to each other instead of to controller. Turn power to controller off and back on. Wait a few seconds for actuators to reboot. Rescan.

7.7   Data Led Is Red And Response Is Slow

- Insufficient voltage supplied to controller.

7.8   Actuator Reports Invalid S/N (Z00000)

- Possible controller malfunction. Verify by substituting another controller.

7.9   Using VISTA

- VISTA 32-bit can use the USB cable. See Section 13.2 if there is a problem using the USB cable on VISTA 32-bit.
- VISTA 64-bit cannot use the USB cable. See paragraph 7.1 for an alternative approach.

7.10   Could Not Find Antenna Definition File

- Remove ATC Lite application from PC and install latest software for the ATC200-LITE-USB using default values for file locations.

7.11   No Devices Found

- Verify USB/RS–232 cable and power cord are connected securely.
- Verify if RET cable is connected to the AISG port.
- Verify power LEDs are lit.
- Verify com port is correct if using serial cable. See Section 7.16.
- May be com port conflict at undetected level (if using serial cable). Reboot PC.
- Check RET cable connections.
- Check RET cables with Test Kit ATTK200-KIT.
- See Section 11 if using smart bias tees.

7.12 Antenna Movement Failed

• Test the actuator in isolation – See Section 5.

7.13 "Device, S/N Rejected, Unable To Control, Skipping…"

• Background:Insufficient information from actuator for controller to control device (garbled message) caused by noise on line, firmware download to actuator failure, or old software (Version 5 or earlier).

   • Power cycle controller.

   • Update controller software.

   • Update firmware on actuator.

   • By-pass TMA to make sure TMA is not interfering with communication.

7.14 Intermittent Error: "FT_purge I/O Error"

• Probably controller malfunction. Verify by substituting another controller.

7.15 Unable To Get Screen Shot

• On laptop, press **Alt** + **Prtscn**. (If **Prtscn** key is the same color as **Fn** key, press **Fn** + **Alt** + **Prtscn**.) Screen shot goes to clipboard without notification. Open Word and paste (**Cntl V**). Screen shot will paste into the Word window.

7.16 Unable To Operate Controller Using Serial Cable

Connecting To A Com Port:

• The ATC200-LITE-USB allows connection through com ports 1 through 8. If no such com port is available, free a port between 1 and 8 for usage by ATC200-LITE-USB. The basic idea is to reassign something using a port between 1 and 8 to a new port setting so that its former port is free for ATC200-LITE-USB.

• On Windows XP (classical view) go to **Start→Settings→Control Panel→System→Hardware Tab→Device Manager→Ports**.

• On Vista, go to **Start→Control Panel→System→Device Manager** (under **Tasks** on left panel)→**Ports (Com & LPT)**.

• We need to free up a communications port numbered less than 8 that can be used by ATC200-LITE-USB. For example, choose port 6. Right click on port 6. Go to **Properties→Port Settings** tab. Click **Advanced**.

   Note: Blue Tooth ports cannot be used. Port settings tab does not appear for Blue Tooth ports, which are not communications ports.

• Click on arrow for drop down menu of **Com Ports**. Select a free com port with number greater than 8. For instance, choose 13. Now the device formerly on 6 will be on 13. Com 6 can now be used by ATC-200-LITE-USB. If no ports are available, see your IT department.

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Section 8
ATC300-1000 Controller Issues

1. **Andrew requires pretesting actuators on the ground prior to installation, using the Andrew portable controller and the latest version of the controller software (available online at www.andrew.com under Products→Antennas→Teletilt® RET System). This will verify proper actuator functionality and also ensure that the latest available actuator firmware release is installed on the actuator. Failure to conduct pre-test and pre-installation procedures defined by Andrew will void warranty.**
2. **Unauthorized removal of a protective shroud to replace actuators voids the Andrew warranty.**

8.1 Unable to Open Software or Connect to ATC300-1000

- Running ATC300-1000 is like connecting to the internet. See ATC300-1000 User Guide (639544) or ATC300-1000 Computer Interface Quick Guide (639571) to use IP config tool to connect to the program. If using Vista, see Section 16 in this bulletin.

- Firewall prevents connection:
  - On PC, go to **Start→Settings→Control Panel→Windows Firewall**. Choose **Off**. To check for other firewalls, go to **Start→Settings→Control Panel→Administrative Tools→Services**. Look for a firewall in the list. Consult your IT professional.

- Proxy server prevents connection:
  - In the Internet browser, go the **Tools→Internet Options→Connections** tab. Choose **Settings**. Deselect "**Use a Proxy Server...**". (Save any settings for later restoration).

- Other network connection may prevent a web page from opening:
  - Disable other network connection (wireless radio or hard connections).

- Incorrect IP address or net mask subnet mask on PC:

  Subnet mask on PC must match subnet mask on controller. See ATC300-1000 User Guide (639544), Section 4, to use the IP config tool to set IP address and mask. See (639544) Appendix B.2 to set IP address in Vista. See (639544), Section 5, to check current IP address of the controller. Also, refer to the ATC300-1000 Computer Interface Quick Guide (639571).

- Try another Ethernet cable. Verify connection.

8.2 Pop-ups Not Allowed

- In the Internet browser, go to **Tools→Pop-up Blocker**. Choose **Turn off Pop-up Blocker**.

- To permanently turn off pop-up blocker for the controller, in the Internet browser, go to **Tools→Pop-up Blocker→Pop-up Blocker Settings**. Enter IP address of controller.

8.3   No Devices Found

During scan, the **Device Search Progress** information box reports finding devices, but scan results report no devices found.

• Turn off pop-up blocker (Section 8.2)

• Connection to the controller may be lost even though the webpage for the controller is still displayed, or the browser may timeout before the web page displays. To prevent this , go to **Tools → Internet Options → Browsing History → Settings** (Figure 8-1). Click the **Automatically** setting so the computer will find the newest page.
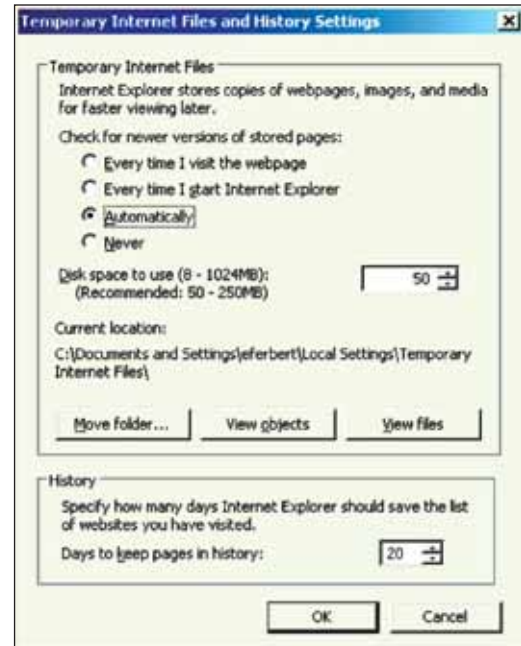
• See Section 6.1 in this bulletin.

Figure 8-1. Setting Temporary Internet Files To ***Automatically****.*

Figure 8-2. ATC300-1000 Status LEDs.

8.4   AISG Status LED Colors – See Table 8-1, below.

Left LED	Right LED	Condition
Blinking green	Blinking red	Insufficient voltage on AISG line. Check input voltage.
Green	Following sequence is repeated every 2 seconds: Green: short red: solid red.	Short in line or line device. Isolate faulty device (Section 5).
Green	Blinking red	High current draw (2.5 to 5 Amps) from some device. Isolate and replace device (Section 5).
Off	Off	No voltage on AISG line. Controller is in suspend mode or there is no input voltage.

Table 8-1. ATC300-1000 Status LEDs.

8.5   Power and Alarm Status LED Colors

• When the top LED is green, the controller is powered up. See Figure 8-2 on the previous page.

• When the top LED is out, there is no input voltage to controller.

• If the bottom LED is red:

   • There are devices still in the controller database but no longer at the site. Manually remove devices.

   • Devices are not being accessed. See Sections 6.1 and 6.2.

   • There is a major alarm. Check alarms and refer to Sections 5 and 6.

8.6   During scan, the "Device Search Progress" information box reports finding devices, but scan results report no devices found.

• Turn off pop-up blocker (Section 8.2).

8.7   Antenna Movement Failed

• Verify sufficient voltage level. On the controller menu bar, go to **Help**→**About**. Voltage level should be close to 24 Vdc.

• Test the actuator in isolation. See Section 5.

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Section 9
ATC300-1000 Using SMB Ports

9.1   No Devices Found

- See Section 8 for general discussion of ATC300-1000 issues.

- Verify using dc 2.1 bias tee. Andrew has two dc 2.1 bias tees:
  ABT-DMDF-ADBA and ABT-DFDM-ADBA.
  Any other bias tee may scramble the AISG signal.

- Verify dc 2.1 bias tee is correctly installed and on correct coax line.

- Verify AISG coaxial surge arrestors are correct type:
  APTDC-BDFDF-DB, APTDC-BDFDM-DB or equivalent.

- Verify top smart bias tee is correctly installed and passes AISG.

- Verify TMA is an AISG smart TMA.

- Verify SMA/SMB cables are connected well and are passing 24 volts.

  - A portable spectrum analyzer can be used to verify that the 2.176 MHz signal is present at the SMB port. (Be sure analyzer can support 24 Vdc.)

9.2   Note on dc 2.1 Bias Tee

- The AISG signal is modulated to 2.176 MHz at the SMB port.

  If the SMB port is connected to a smart bias tee, the signal may be scrambled and hamper communication.
  If an ordinary bias tee is used, the signal may be blocked.

  Because of this, a dc 2.1 bias tee is recommended.

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Section 10
ATC200-1000 Issues

10.1 Unable to Open Software or Connect to ATC200-1000

- Consult ATC200-1000 User Guide (639514) or ATC200-1000 Computer Interface Quick Guide (639561) to use IP config tool to connect to the controller.
- If using Vista, see Section 16.
- See Section 8.1 for other suggestions.

10.2 Pop-ups Not Allowed

- In the Internet browser, go to **Tools→Pop-up Blocker**. Select **Turn off Pop-up Blocker**.
- To permanently turn off pop-up blocker for this controller:
  In the Internet browser, go to **Tools→Pop-up Blocker→Pop-up Blocker Settings**.
  Enter IP address of controller.

10.3 No Devices Found

- Turn off pop-up blocker (Section 10.2).
- ATC200-1000 cannot find devices in AISG 2.0 mode. It can find AISG 1.1 devices through a TMA in AISG 2.0 mode.
- See Sections 6.1 and 8.3.

10.4 Status LED is Red

- One possibility is that there are devices in the controller database that are no longer being accessed. Manually remove the devices.
- Another possibility is that some devices are not being accessed. See Section 10.3.

10.5 Antenna Movement Failed

- Verify sufficient voltage level. On the controller menu bar, go to **Help→About**.
  Voltage level should be close to 24Vdc. (Voltage is next to **AISG**.)
- Test the actuator in isolation. See Section 5.

10.6 Cannot Upload Software to Controller

- More than one FTP server may be running. To check, enter **FTP://localhost** in the internet

browser URL. Close undesired server.

- Make sure the firewall is not running. This is worth checking because you can send and receive off port 80 (http) but still could be blocked from passing files on port 21 (i.e. FTP).

10.7 Cannot Find Devices After Installing New Software

- Reboot controller

10.8 Cannot Contact Controller Either By Serial or Ethernet Cable

- Verify IP settings and connection for LMT port.
- Try using another controller. The controller may need replacement.
- Verify that correct IP settings are being used for the LMT port (10.254.254.253) and for the Ethernet port (factory default is 192.168.255.141).

10.9 FTP Only Works Partially and Stops

- Verify that this is consistent by repeated trials.
- Try another PC.

Section 11
Smart Bias Tee Issues

11.1 No Devices Found

- Verify that surge arrestor on coax line can pass dc. Two acceptable surge arrestors are APTDC-BDFDF-DB and APTDC-BDFDM-DB. Other types may ground the dc voltage, preventing voltage from reaching the actuator, TMA, etc.)

- Verify that the smart bias tees are installed correctly.

- Verify that the coax line doesn't have a short by connecting ohmmeter between connector pin and shield. (Line could have a short even if it sweeps OK.)

- Another device in the coax line (such as a cross-band coupler) may ground dc. You may need to introduce a dc block in the line.

- Top and bottom bias tees may not be on the same coax line.

- See Section 12, TMA Issues.

- See Section 5, Isolate and Replace.

Note: For information on smart bias tees, see "Smart Bias Tees, Configurations, and Practical Usage" white paper, available on the Andrew website:
http:\www.commscope.com→andrew→eng→products→antennas→ teletilt→literature.

Section 12
Tower Mounted Amplifier (TMA) Issues

12.1 No Devices Found

- Verify that the TMA type supports AISG.

- If TMA type is E15S08P74, replace with TMA that supports AISG, or bypass TMA with AISG home-run cable.

- Recycle power to PDU.

- Verify that smart bias tees and TMAs are properly oriented (misconnection to TMA can cause a short on the coax).

- See Section 11 for smart bias tee issues.

Section 13
Correcting USB Driver Issues for ATC200-LITE-USB

If the ATC200-LITE-USB is installed while the USB cable is connected to the PC, the system will say there is no USB connection. This section describes correcting this problem.
See Section 7.1 if using Vista 64 bit.

13.1 Correcting USB Driver Problem on XP

Connect ATC200-LITE-USB to PC using a USB cable.

Locate driver information as follows:
- Right click on **My Computer→Properties→Hardware tab→Device Manager**.
- Scroll down to **Universal Serial Bus Controllers** and expand this USB directory branch.
- Look for ATC200-Lite-USB in the USB branch or possibly in a branch called Other.

If "ATC200-LITE-USB" is found in a branch:

Screen Title(s)	Action
	Right click on **ATC200-Lite-USB** in the branch.
	Click on **Update Driver**.
Welcome to the Hardware Update Wizard	Select **No, not this time**. **Next**
Hardware Update Wizard	Left click on **Install from a list….** **Next**
Hardware Update Wizard: Please choose your search and installation options.	Click on **Include this location in the search**: [If the default file was used at installation, enter **C:\ Program Files→Andrew Corporation→ATC Lite** Otherwise, go to the desktop, right click on the ATC Lite icon and click on **properties** to get the folder where the driver is located.] **Next**
Hardware Installation	Click on **Continue Anyway**. Wait for install. If you get the response **Files Needed**, reenter the file from previous step. (Check spelling.) **OK**
	Finish

Table 13-1. Correcting USB Driver Problems.

If "ATC200-LITE-USB" is not found in a branch:

Screen Title(s)	Action
	Go to Control Panel. Click on **Add Hardware**.
Add Hardware Wizard: Welcome to the Add Hardware Wizard	**Next** (Wait for search to finish.)
Found New Hardware Wizard: Welcome to the Found New Hardware Wizard	Select **No, not this time.** **Next**
Found New Hardware Wizard	Select **Install from a list…** **Next**
Found New Hardware Wizard: Please choose your search and installation options.	Select **Include this location in the search**: [If the default file was used at installation, enter **C:\ Program Files→Andrew Corporation→ATC Lite**. Otherwise, go to the desktop, right click on the ATC Lite icon and click on **properties** to get the folder where the driver is located.] **Next**
Hardware Installation	Click on **Continue Anyway**. Wait for install. If you get the response **Files Needed**, reenter the file from previous step. (Check spelling.) **OK**
Found New Hardware Wizard: Completing the Found New Hardware Wizard	**Finish**
Add Hardware Wizard: Completing the Add Hardware Wizard	**Finish**

Table 13-2. Correcting USB Driver Problems.

If the previous two approaches do not work:

Screen Title(s)	Action
	Go to Control Panel→**Add or Remove Programs.** (Wait for programs to be listed.)
ATC Lite	Select **ATC Lite** **Remove**
	Choose **Yes**
Remove the USB cable for the ATC200-LITE-USB from the PC.	
	Go to http://**www.commscope.com**→**Andrew**→ **eng**→**product**→**antennas**→**teletilt.**
	Select **Downloads**→**Teletilt® Software, Firmware, Tools, and Manuals**.
	Select **ATCLite v.xx** (.xx is the version). Register and select **Get Software**.
	Select **Open**
	Click on **ATCLite xx Setup.msi**
File download security warning	Click **Run**
ATC Lite	Click **Next**
ATC Lite: Installation Complete	**Close**
Connect the USB cable for the ATC200-LITE-USB to the PC.	
	Click on ATC Lite Icon
If the Found New Hardware Wizard appears, continue below. Otherwise, the process is complete at this point.	
Found New Hardware Wizard: Welcome to the New Hardware Wizard	Select **No, not this time**. **Next**
Found New Hardware Wizard	**Select Install from a list… Next**
Found New Hardware Wizard: Please choose your search and installation options.	Select **Include this location in the search** [If the default file was used at installation, enter **C:\ Program Files**→**Andrew Corporation**→**ATC Lite**. Otherwise, go to the desktop, right click on the ATC Lite icon and click on **properties** to get the folder where the driver is located.] **Next**
Found New Hardware Wizard: Please wait.	

Table 13-3. Correcting USB Driver Problems.

Hardware Installation	Click on **Continue Anyway**.
Files Needed	If this screen appears, …reenter the file from previous step. (Check spelling.) **OK**
Found New Hardware Wizard: Completing the Found New Hardware Wizard	**Finish**

Table 13-3. Correcting USB Driver Problems (continued from previous page).

13.2 Correcting USB Driver Problem on Vista

The following steps show you how to correctly install ATC200-Lite-USB drivers on a PC running on Windows® Vista.

1. Prior to installing hardware drivers you must first connect your ATC200-Lite-USB to your computer using the USB cable.

2. Connect power to your ATC200-Lite-USB.

3. From your Desktop, select **Start→Control Panel**. The little flag in the bottom left hand corner is your **Start** button.

4. Select **Device Manager** from your **Control Panel** (Figure 13-1).
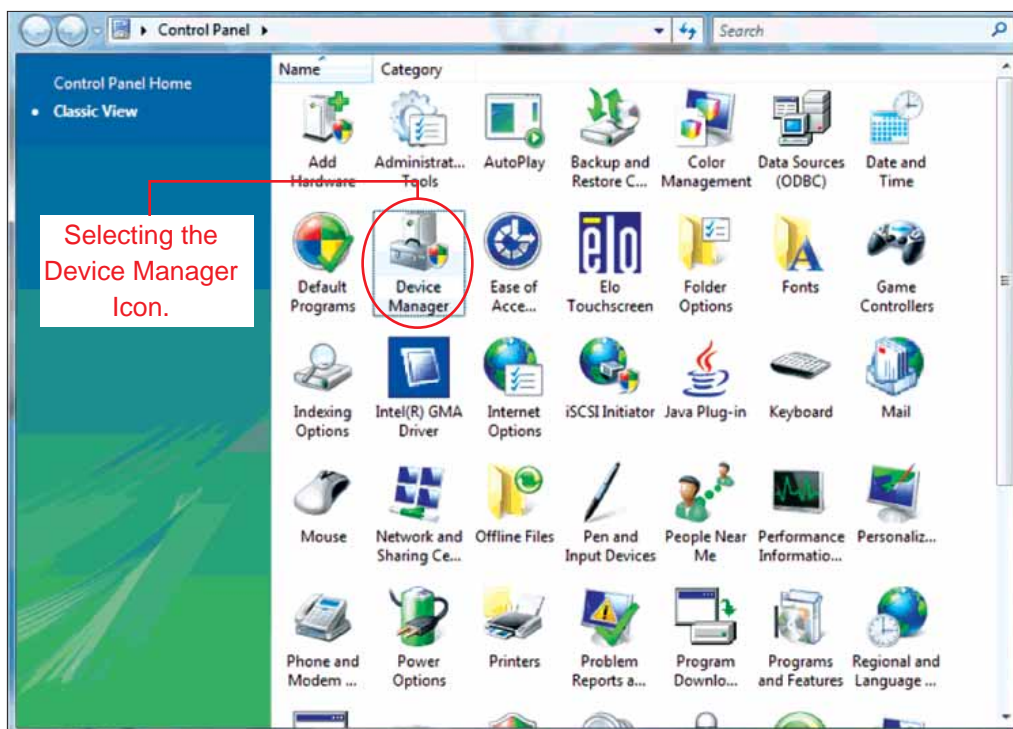
Figure 13-1. Windows Vista Control Panel

Microsoft, Encarta, MSN, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

5. Open **Universal Serial Bus controllers** tree (Figure 13-2).

6. Note that a yellow dot with an exclamation point may appear to the right of **ATC200-LITE-USB**. This indicates that Windows does not know what the device is. You may also see a tree branch called **Other**. The **ATC200-LITE-USB** may also appear under that branch. Right click on **ATC200-LITE-USB** (Figure 13-2).
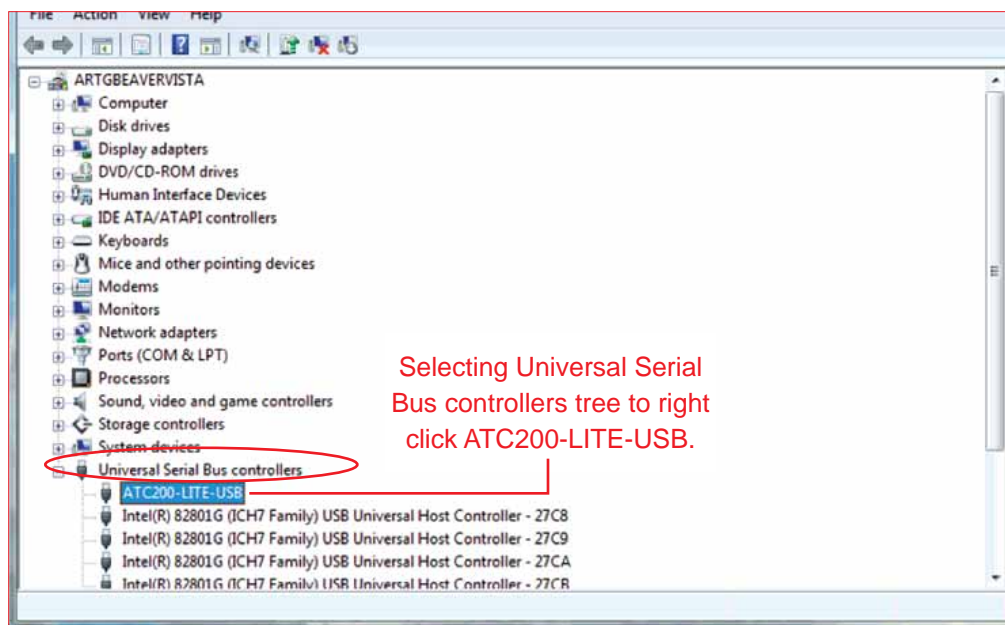

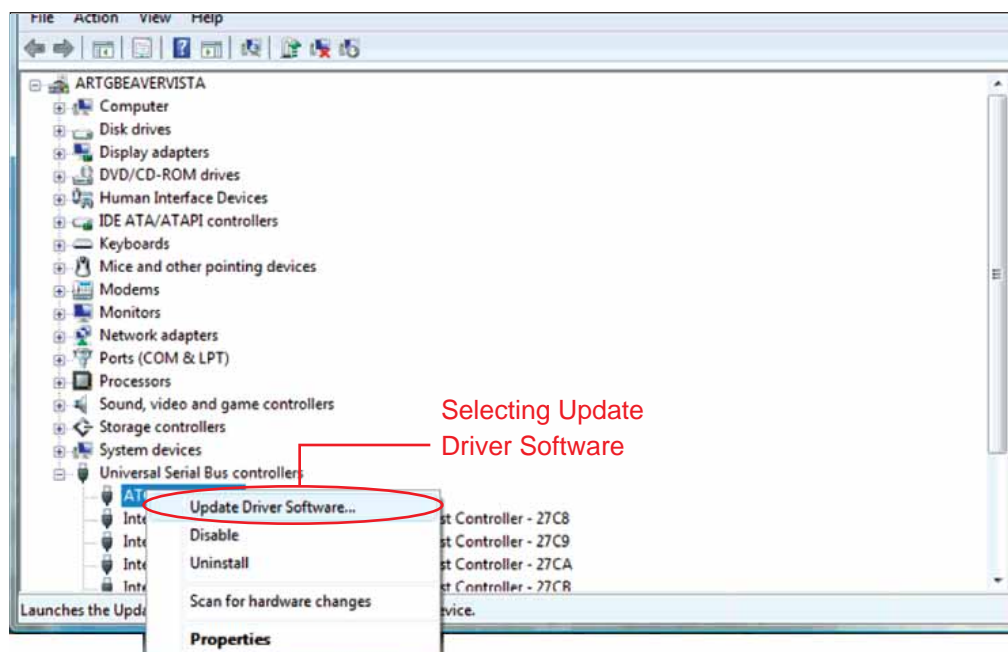*Figure 13-2. Selecting **ATC200-LITE-USB**.*

7. Select **Update Driver Software** (Figure 13-3).

*Figure 13-3. Selecting **Update Driver Software**.*

8.   A **Hardware Wizard** window will open. Select **Browse my computer for driver software**.
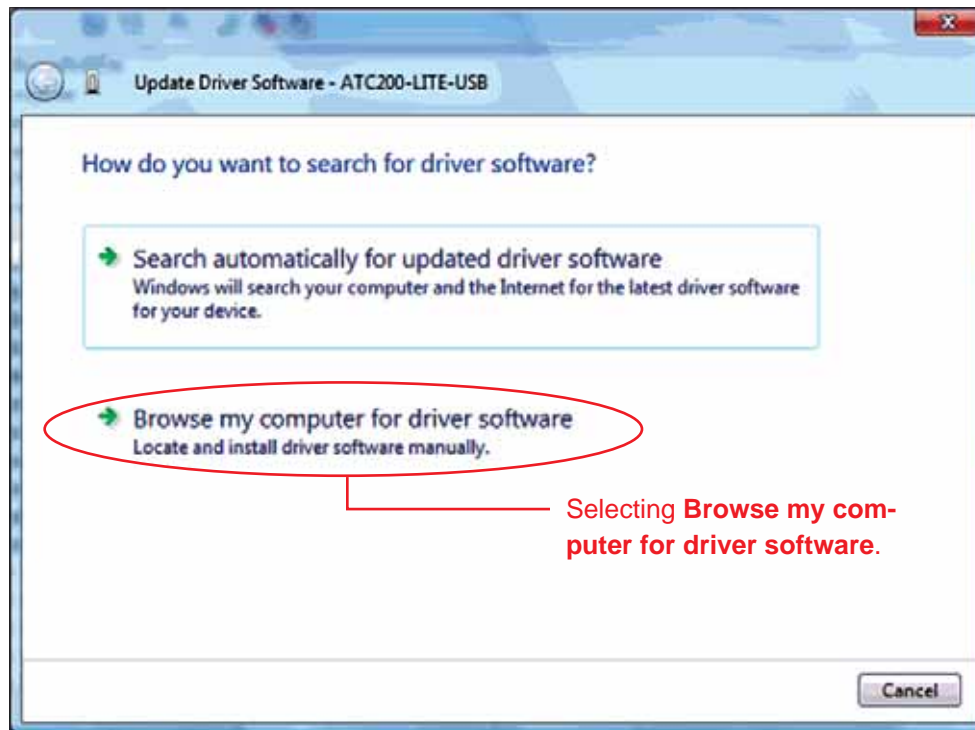
Figure 13-4.   Opening the Hardware Wizard.

9.   Select **Browse**.
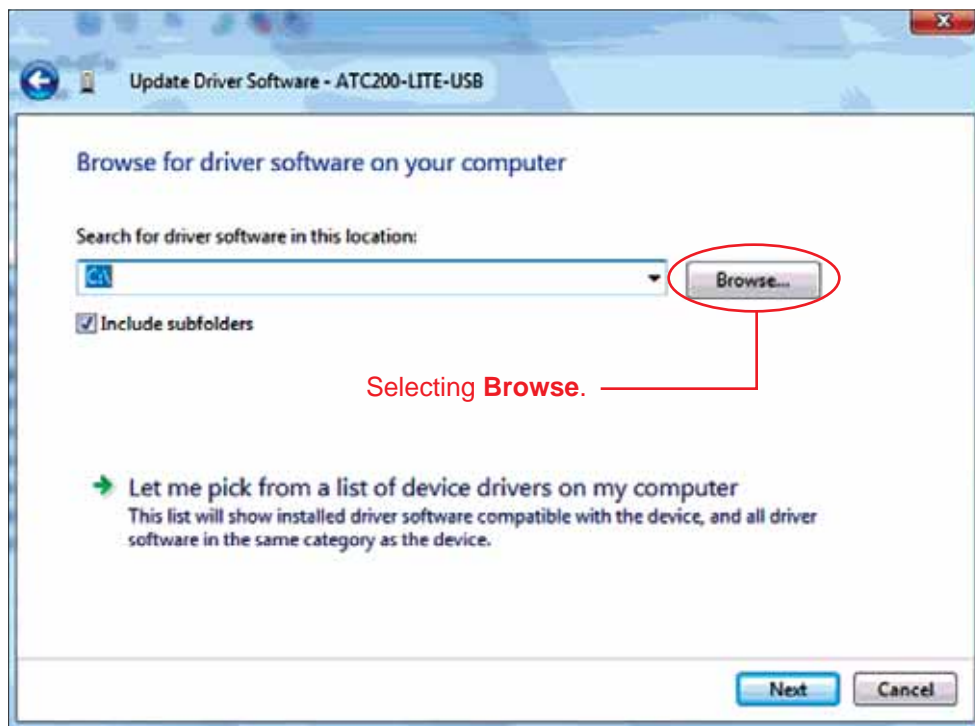
*Figure 13-5.   Selecting **Browse**.*

10. Navigate to the following folder; **C:\Program Files→Andrew Corporation→ATC Lite**. Select **Next** (Figure 13-6). Hardware wizard will now extract the USB device drivers from the ATC Lite folder and place them in appropriate Windows folders for use.
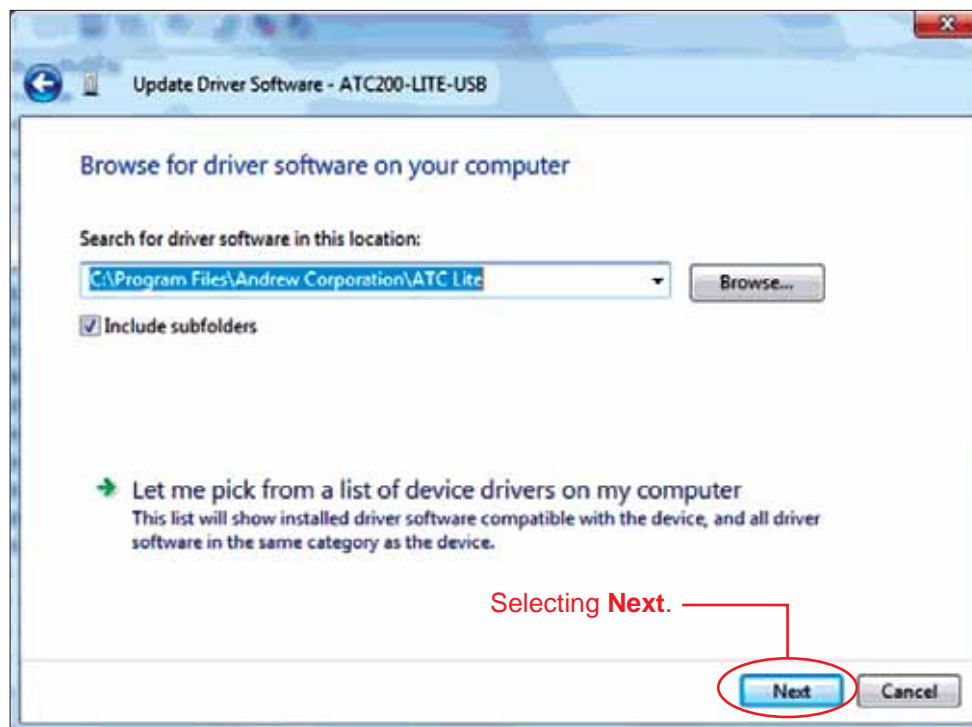

Figure 13-6. Extracting USB Device Driver.

Windows may open an Alarm Window indicating that the drivers you are installing have not been verified.
Select **Continue anyway** to finish loading the drivers.

11. Windows will display **Update Driver Software-ATC200-LITE-USB** (Figure 13-7) and your ATC200-LITE-USB is now ready to be used.
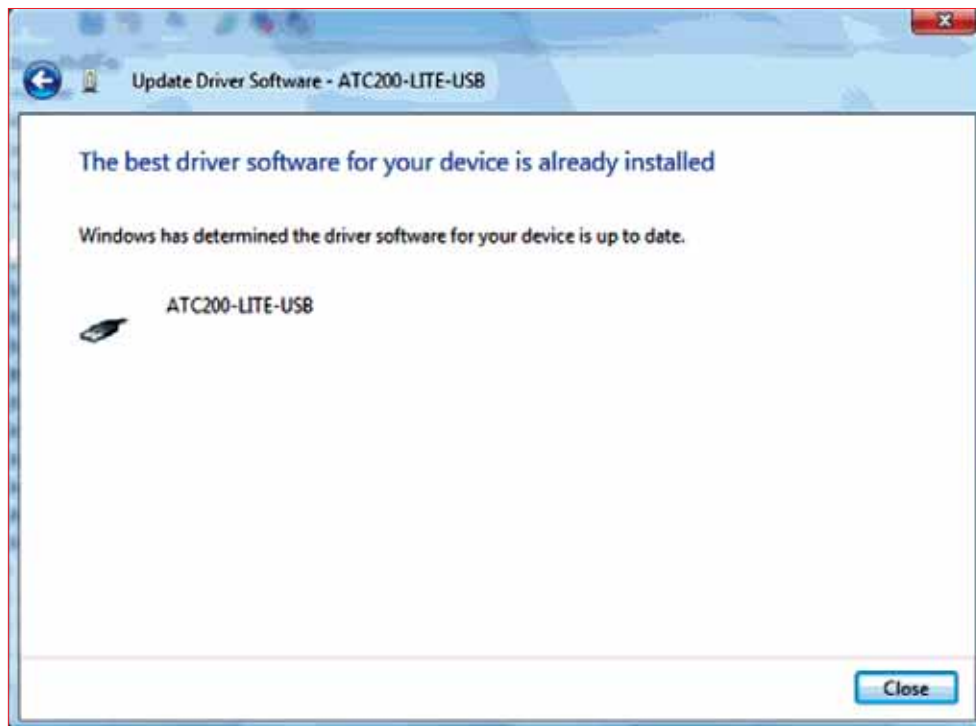

Figure 13-7. Driver Software is Up To Date.

Section 14
Finding Controller IP Address When Unknown

- Access to ATC200-1000 and ATC300-1000 requires an IP address. If the address is unknown, it can be found by using a serial cable.

- Finding the address on XP is documented in the user guides for ATC200-1000 (Bulletin # 639514) and for ATC300-1000 (Bulletin #639544). These documents are available from the Andrew Products tab on www.commscope.com. Click on **Antennas→Teletilt RET System→Downloads→Teletilt RET Products Software, Firmware, Tools, and Manuals**.

- ATC300-1000 needs terminal emulators such as "Hyper Terminal" to find the IP address over a serial cable. This is no longer available with Vista. Versions of "Hyper Terminal" for Vista can be found by searching the Internet.

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Section 15
Setting IP Addressing on a PC Using Vista to Connect to ATC200-1000 or ATC300-1000

15.1 Setting an IP Address Using Windows Vista™

The following procedure will show you how to change your IP Address if operating a Windows Vista computer, so you can network with the ATC200/300-1000 controller.

This procedure will only work on controllers that are still set up with the default IP Address 192.168.255.141 and with Subnet Mask 255.255.255.0. If your default address has been changed, consult your operations manual for procedure to reset the default IP address.

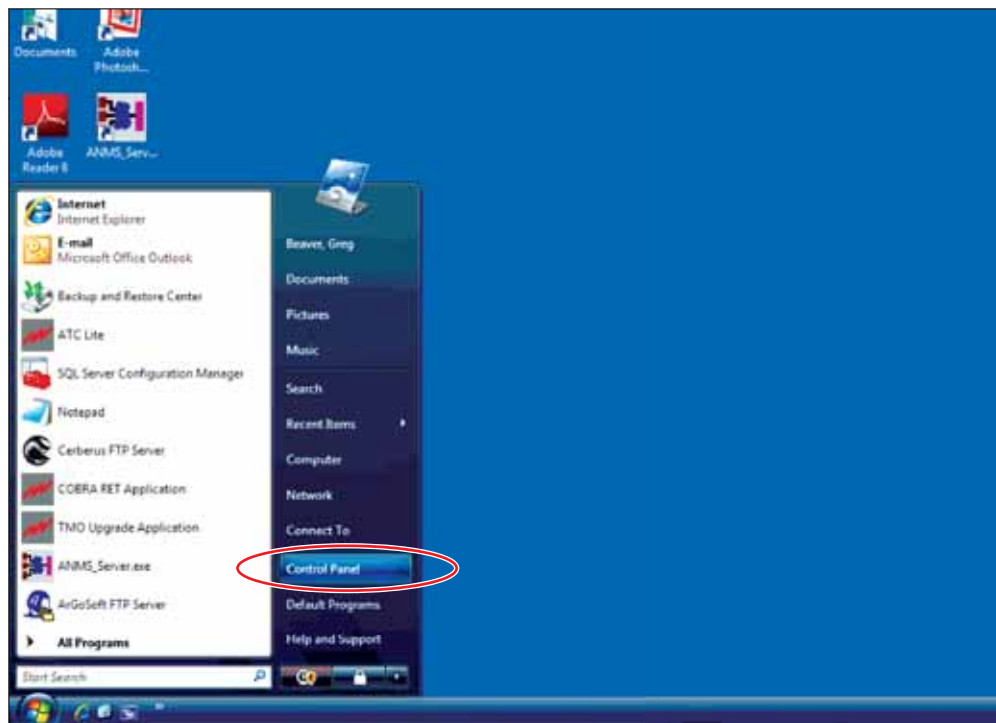1. From your desktop, you are going to select **Start** → **Control Panel** (Figure 15-1)**.**

*Figure 15-1. Selecting **Control Panel**.*

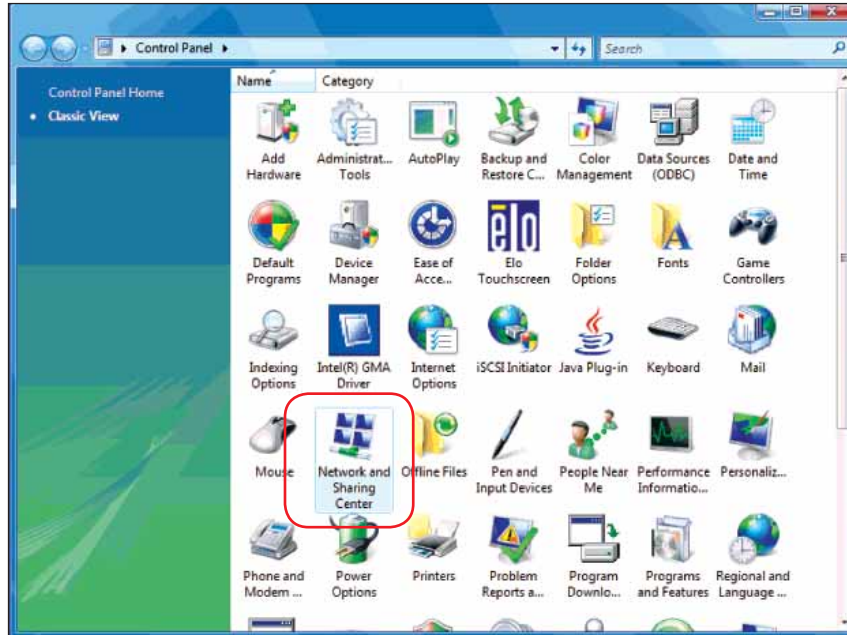2. Click on **Network and Sharing Center** (Figure 15-2).

*Figure 15-2. Selecting **Network and Sharing Center**.*

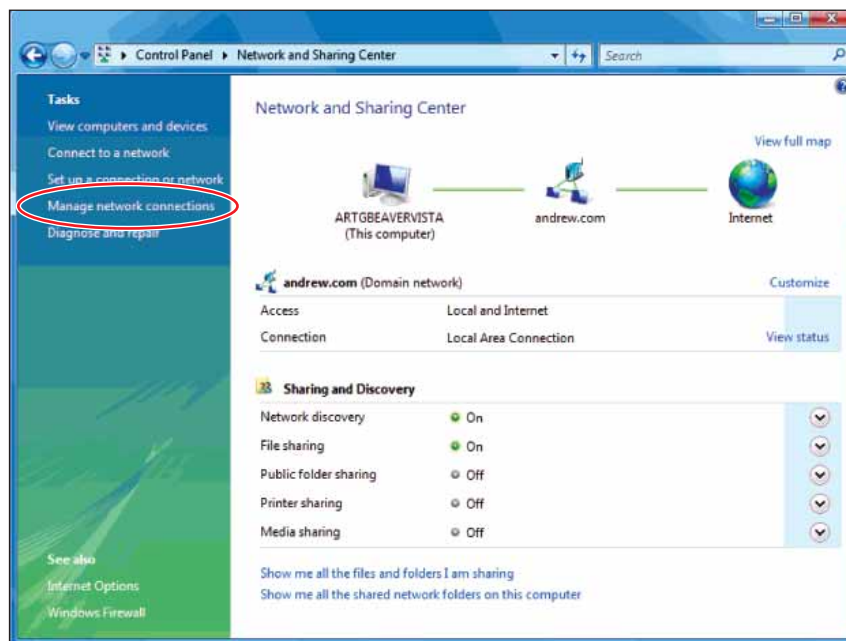3. Select **Manage Network Connections** link (Figure 15-3).

*Figure 15-3. Selecting **Manage Network Connections**.*

4. Click on **Local Area Connection** (Figure 15-4). This may appear differently on your computer. Ensure that you are using the connection that represents your RJ45 port on the back of your computer.
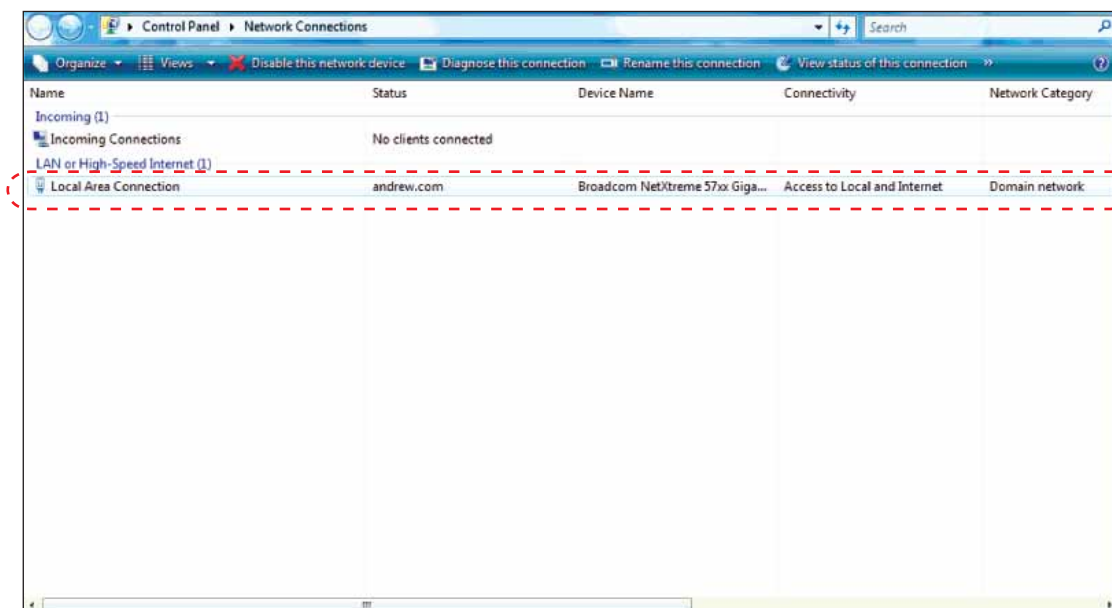

*Figure 15-4. Selecting **Local Area Connection**.*

5. Your **Local Area Connection Status** window will open. Select **Properties** (Figure 15-5).
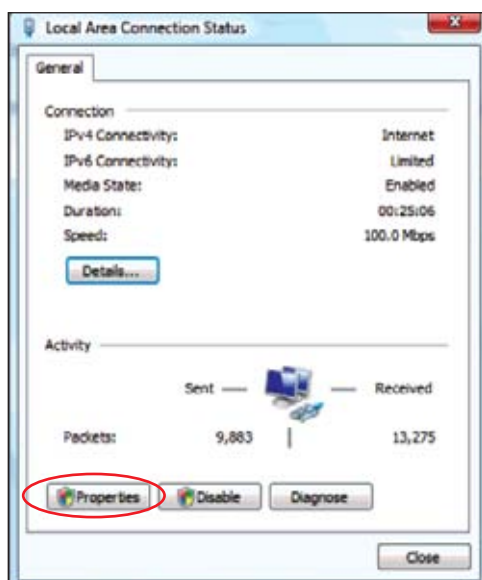6. Double click **Internet Protocol Version 4 (TCP/IPv4).** See Figure 15-6.
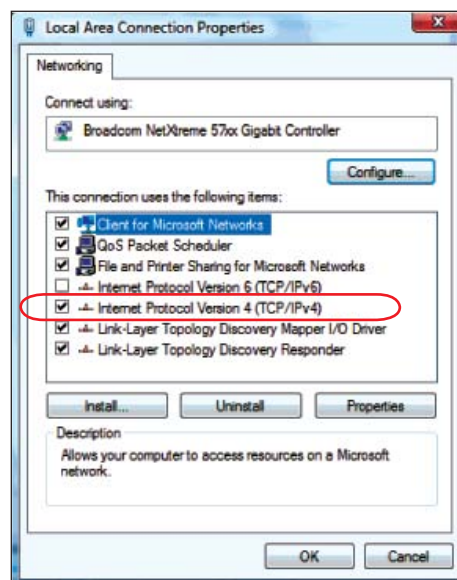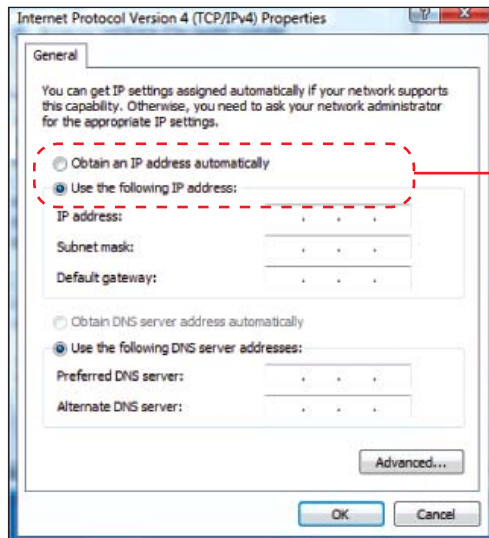

Figure 15-5. Local Area Connection Status.

Figure 15-6. Local Area Connection Properties.

7. Most computers are setup to use DHCP with their Home/Work Networks. If this is the case, the **Obtain an IP address automatically** radio button will be selected. If you have a static IP address, the **Use the following IP address** radio button will be used (Figure 15-7).
    Ensure that you record your current settings, so when you have completed your work with the ATC200/300-1000, you can reset your system for Home or Office networking (Figure 15-7).

8. Select **Use the following IP address** radio button (Figure 15-8).

9. Type the IP Address 192.168.255.140 and Subnet Mask 255.255.255.0 (Figure 15-8).
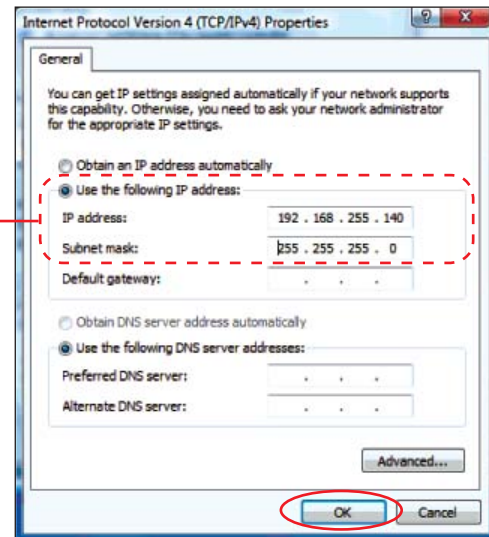
10. Select **OK**.

Figure 15-7. Setting Needed to Restore the Computer to its Original IP Identity.

Figure 15-8. Enter New IP address and Subnet Mask.

11. Select **OK** (Figure 15-9).

12. Select **Close** (Figure 15-10). You can now close any additional windows.
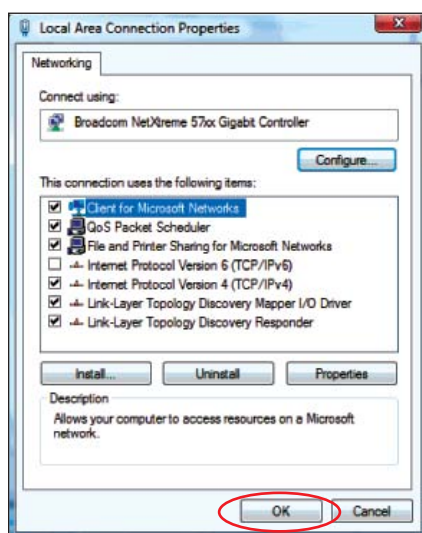
Figure 15-9. Local Area Connection Properties.
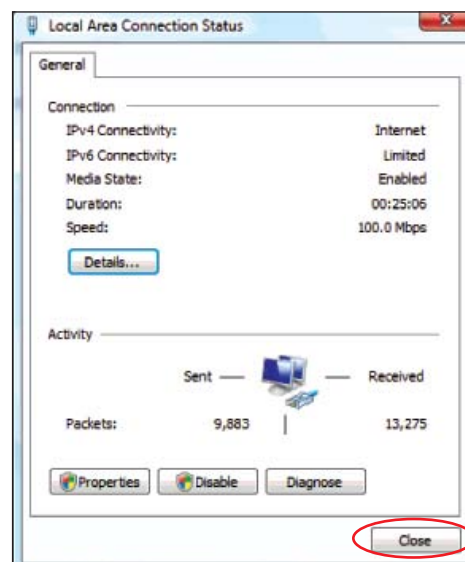
Figure 15-10. Local Area Connection Status.

13. From your desk top, open I**nternet Explorer** (Figure 15-11).

14. To open the ATC300-1000 main interface screen, type **http://192.168.255.141/** in Explorer's address bar (Figure 15-12).

15. Once you completed controller operations, follow the previous steps to reset your computer to its original configuration.

Figure 15-11. Internet Explorer Desktop Icon.

Figure 15-12. ATC300-1000 Controller Main Interface Screen.

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Section 16
Software Upload (FTP) to ATC300-1000 or ATC200-1000 Using Vista

16.1 Using IP Config Tool as an FTP Server

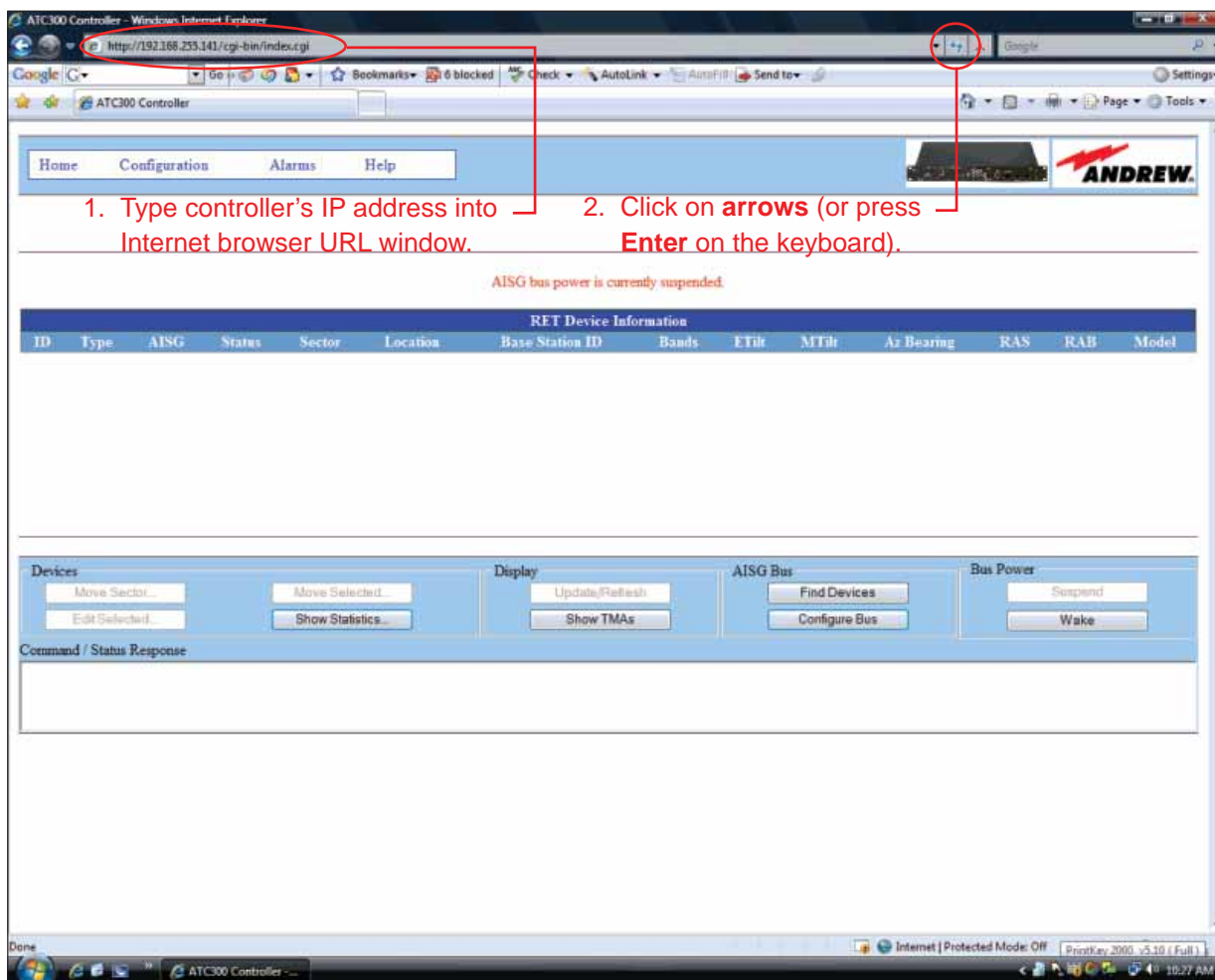The IP Config Tool can be used as an FTP server on a Vista operating system. The limitation is that IP Config cannot push the file transfer. Instead, the transfer is pulled using the controller.

1. Make sure firewall is turned off (Section 8.1).

2. Connect to the controller. See user guides 639544 (ATC300-1000) or 639514 (ATC200-1000), available from the Andrew Products tab on www.commscope.com. Click on **Antennas→Teletilt RET System→Downloads→Teletilt RET Products Software, Firmware, Tools, and Manuals**.

3. Locate and add files to transfer as instructed in the ATC200-1000 Computer Interface Quick Guide (639561), or the ATC300-1000 Computer Interface Quick Guide (639571).

4. Go to the controller home page. Select **Configuration→Software Config**.

5. Enter the IP address of the PC where the software is located followed by the file name. Example: **192.168.255.140/atc300_210.tar**. Note that the file name is case sensitive.

6. Return to configuration screen and reboot.

7. See the user guides for more details.

Section 17
Node B Controller Notes

- For Nokia and Ericsson embedded controllers, actuators must have a firmware version of 2.0.20 minimum or higher to operate correctly.

- If the Node B shuts down when trying to adjust an Andrew actuator:

  1. Apply latest firmware to the actuator using ATC200-LITE-USB:
     - Complete procedure is detailed in the ATC200-LITE-USB User Guide, Bulletin # 639536. See Section 3, Uploading Firmware.
     - DOWNLOAD the latest antenna definition file and ATCLite/ATM200 software files from the **Andrew→Products** tab on www.commscope.com.
       Click on **Antennas→Base Station Antenna Systems→Teletilt RET System→Downloads →Teletilt RET Products Software, Firmware, Tools, and Manuals**.

  2. Clear the alarm in the actuator using the ATC200-LITE-USB (either by clicking on the **CLEAR ALARM** button or by a successful move).

- See Node-B controller documentation from the manufacturer for further analysis.

Section 18
Interoperability with Non-Andrew Devices

18.1 ATC200-LITE-USB

- ATC200-LITE-USB is not designed to work with actuators, etc. of other manufacturers. Functionality would need to be verified through interoperability testing.

- ATC200-LITE-USB equipment can generally be used with software from other manufacturers. (For example, use Cobra software and ATC200-LITE-USB on serial cable to control legacy EMS products.)

18.2 ATC300-1000

- ATC300-1000 does not display height, location, technology, and antenna type for non-Andrew actuators, because these parameters are Andrew specific. TMAs also do not have these parameters.

18.3 Kathrein

- ATC200-LITE-USB can change tilt of Kathrein actuators if they have previously been configured. ATC200-LITE-USB cannot configure Kathrein actuators.

- Both ATC200-1000 and ATC300-1000 can be used with a special configuration file to configure Kathrein actuators. Contact Andrew Customer Support.

18.4 Using ATC200-1000 to Control Powerwave Antennas

- The antenna definition file is RET_LA_AT_xxx.ascu. 'xxx' is the version number.

- Available from Andrew Technical Support.
  To get the antenna definition file, call Andrew Technical Support (1-800-255-1479, Option 1).

- System build for ATC200-1000 has to be 454A5 or later (found by going to controller menu bar **Help→About**).

- When configuring a Powerwave antenna, highlight the antenna on the home page.
    Click on **Edit Selected**.
    Choose antenna model.
    Click on **Calibrate**. (Calibration has to be done frequently, for example, when you change the sector ID for the antenna.)

Section 19
Miscellaneous

19.1 Dropped Coverage

- Actuator has been replaced and new actuator is set at max tilt angle.
- Adjust tilt angle.

Part 3

Troubleshooting

COBRA™ Systems

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Section 20
COBRA™ RET System Diagnostics

20.1 Isolating the Malfunction

Finding the root cause of a failure is usually not necessary. It is enough to isolate a malfunction and replace the device or cable. Refer to Figure 20-1 for an example of how the COBRA home-run control cable or a spare control cable can be used to locate a malfunction. This example can also be used for configurations with bias tees.
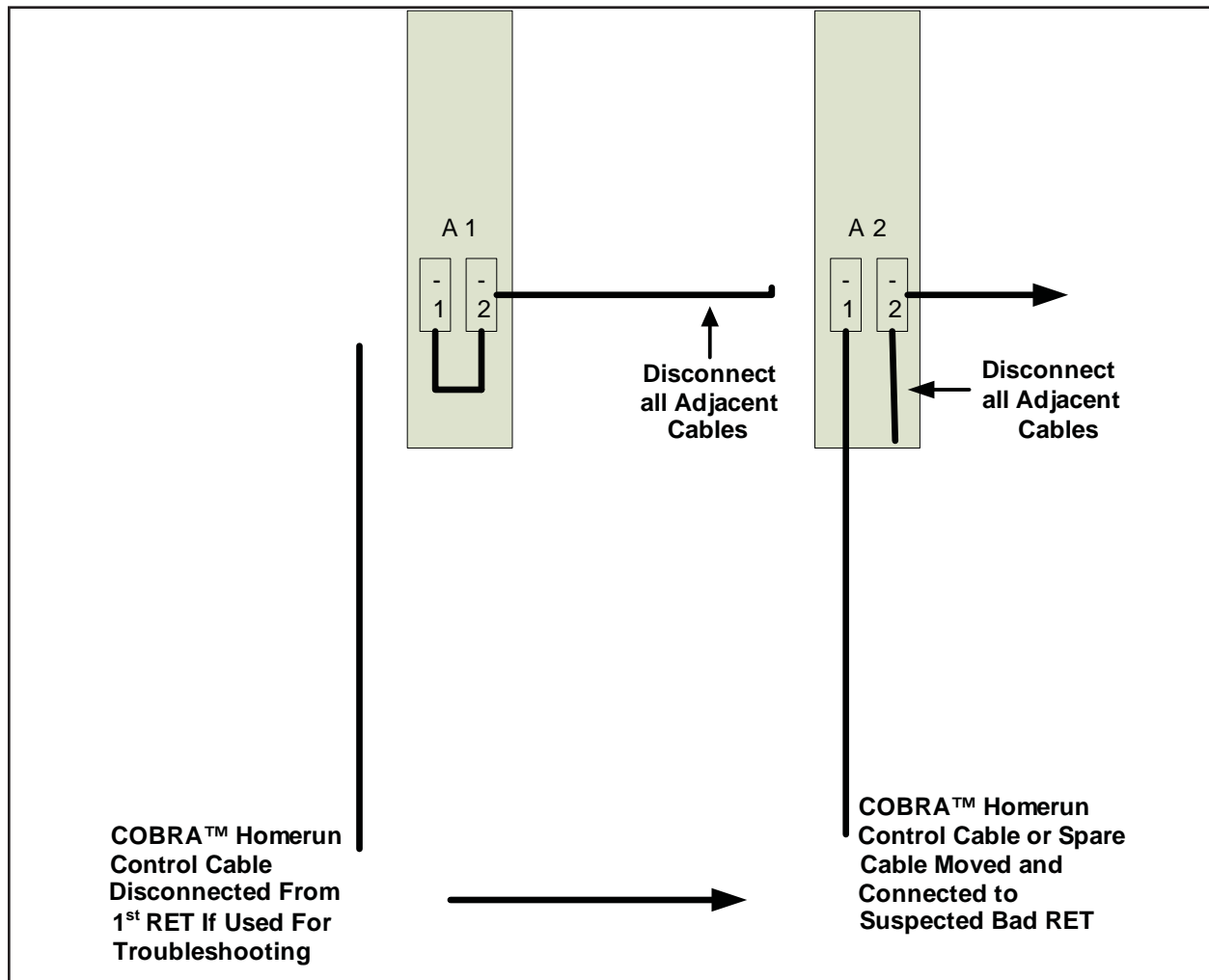

Figure 20-1. Isolating the Malfunction.

There can be several reasons as to why an actuator is not found during a device scan.

20.1.1 Damage During Installation

When the power is applied from the COBRA controller and connected to a cable that is not properly aligned with the keyed notch on the actuator, it is possible to damage one or more electronic components in the actuator.

Note: Do not turn the power on the controller until the cables has been correctly installed.

WARNING!

When turning on the controller power and the green LED is flickering, turn the power off immediately. This is indicating that there is a short circuit condition somewhere within the AISG circuitry. The shorting condition can be caused by improper installation or that the circuit inside an actuator has been damaged by some external event such as a lightning strike.

20.1.2 Direct or Indirect Exposure to Lightning

An actuator is unlikely to survive a direct hit from lightning or even exposure to transients from an indirect strike that exceed the component(s) surge specification.

20.1.3 Product Failure

The antennas and actuators are 100% tested in the factory, so the chance of a failure out of the box is rare. If an actuator is suspected to be malfunctioning, confirm by isolating and scanning the single actuator. If there is no communication, the actuator can be field replaced or the entire antenna assembly can be returned depending on the customer preference.

IMPORTANT!

If the electronic circuitry of an actuator has been damaged, it is possible that it will cause further damage to the remaining actuators in cascade if the power continues to be applied from the COBRA controller. The actuators that were not located in the scan MAY NOT necessarily be the ones that need replacing. Cases have been seen in the field where an incorrectly installed or malfunctioning cable can cause an actuator to be missed during a device scan.

20.1.4 Exceeded Power COBRA Maximum Length Specifications

The farthest actuator should not exceed a 130 meter distance from the Power COBRA controller.

Symptom	Possible Cause	Remedy
Permanent jam	Bad actuator motor	Replace RET or replace complete antenna assembly.
Permanent jam	Actuator shaft on antenna is not moving properly	Return complete antenna assembly.
Temporary jam	Insufficient movement of RET motor or insufficient movement of actuator shaft on antenna	Select the Clear Tab and rescan and connect to RET. If symptom returns, replace RET or replace complete antenna assembly.
Device disabled	RET is no longer connected	Rescan and reconnect to RET.

Note: If any other AISG errors occur, rescan the RET and reconnect. If the symptom persists, replace the RET or replace the complete antenna assembly.

Table 20-1. AISG Error Troubleshooting Chart.

Symptom	Possible Cause	Remedy
Timeout error	Exceeding AISG cable length for COBRA Actuators	Verify the cable length is not exceeding the maximum length limits.
Timeout error	The RET has inadvertently become disconnected	Rescan and reconnect to RET. If symptom returns, isolate the RET to see if the problem goes away. If the isolated RET operates normally, then there is a good chance that there is insufficient voltage on the AISG circuit. If the symptom returns, while the RET is isolated, replace RET or replace complete antenna assembly.
Packet frame error	RET is bad or insufficient voltage on AISG line	Rescan and reconnect to RET. If symptom returns, isolate the RET to see if the problem goes away. If the symptom remains, verify there are at least 16 volts dc feeding into the RET input. This can be checked at the AISG female cable assembly. If the voltage is present, then replace RET or replace complete antenna assembly.

Note: If any other packet errors occur, rescan the RET and reconnect. If the symptom persists, replace the RET or replace the complete antenna assembly.

Table 20-2. Packet Error Troubleshooting Chart.

20.2 Customer Technical Support

For additional assistance contact the North American Customer Support Center at 1-800-279-8185 or International at 1-779-435-6500.

20.3 Improper Site Installation Examples

A base station site that is not performing properly may be the result of poor installation practices. Figures 20-2 through 20-4 are examples of installations that could be the cause of a site not operating normally.

Figure 20-2. Improper Site Installation - Example 1.

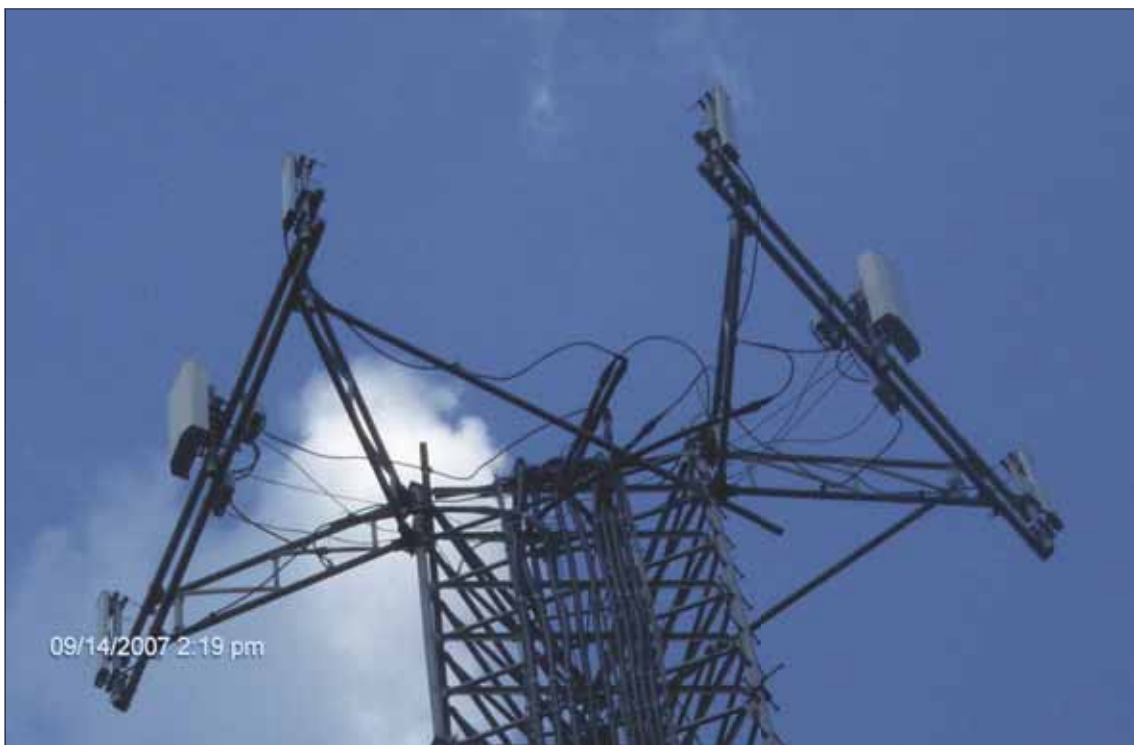*Figure 20-3. Improper Site Installation - Example 2.*

Figure 20-4. Improper Site Installation - Example 3.

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