CalAmp

4-4-05

TCB
TÜV America Inc
10040 Mesa Rim Road
San Diego CA 92121

Re: Compliance Statement information
DirectedAPTM (Airespace 1500)

The DirectedAP™ (Airespace 1500) sold by CalAmp, Corp., to Airespace, Inc., contains integral internal 802.11a and 802.11b/g antennas and has no provisions for an external antenna. Because we are not responsible for the content in the users manual, we are notifying Airespace of the required statements that must be placed in their manual to meet the requirements of the Federal Communications Commission CFR 47 and Industry Canada RSS-210. A copy of this letter is attached.

Sincerely

Steve Loughran
Director of Engineering
952-380-5881
952-380-4823 FAX
sloughran@calamp.com

CalAmp

4-4-05

Airespace, Inc.
Atten: Bill Delveaux
110 Nortech Parkway
San Jose, CA 95134

Re: Compliance Statement requirements for the DirectedAP™ (Airespace 1500)

The DirectedAP™ (Airespace 1500) sold by CalAmp, Corp., to Airespace, Inc., contains integral internal 802.11a and 802.11b/g antennas and has no provisions for an external antenna. Because we are not responsible for the content in the users manual, we are requesting that the following required statements be placed in the Airespace 1500 manual to meet the requirements of the Federal Communications Commission CFR 47, Part 15, and Industry Canada RSS-210.

To meet the requirements of the CFR 47, Part 15, Paragraph 15.21, we request that the following required caution statement be added to the Airespace 1500 manual:

> "Non-Modification Statement: Use only the integral internal antenna supplied with this device. Unauthorized antennas, modifications, or attachments could damage the badge and could violate FCC regulations and void the user's authority to operate the equipment."

To meet the requirements of the CFR 47, Part 2, Paragraph 2.1093 for a mobile device that must maintain a separation distance of at least 20 cm, we request that the following required RF Exposure caution statement be added to the Airespace 1500 manual:

> "RF Radiation Hazard Warning: To ensure compliance with FCC RF Exposure requirements, this device must be installed in a location such that the antenna of the device will be greater than 20 cm (8 in.) from all persons."

Sincerely,

Steve Loughran
Director of Engineering
952-380-5881
952-380-4823 FAX
sloughran@calamp.com

CalAmp

4-4-05

TCB
TÜV America Inc
10040 Mesa Rim Road
San Diego CA 92121

Re: DirectedAP™ (Airespace 1500) Internal Integral Antenna

The DirectedAP™ (Airespace 1500) wireless LAN access point operates exclusively with an internal antenna that is not accessible without disassembling the unit. Even if one disassembles the protective shroud, the antenna is permanently affixed to the mode wall with screws that are only accessible after further disassembly of the mode walls. To disassemble the mode walls, twelve security screws need to be removed using a custom CalAmp tool not supplied with the device. Additionally, the antenna feed connector is a Hirose connector, not a standard BNC or RF type. An extraction tool is needed to remove the cable without damage.

CalAmp Corp believes that this meets the requirements of Section 15.203 of the Code of Federal Regulations, Title 47.

Sincerely,

Steve Loughran
Director of Engineering
952-380-5881
952-380-4823 FAX
sloughran@calamp.com

AS 1500 Intelligent RF AP Quick Installation Guide

System Release 3.0

This Guide contains several sections allowing you to install an AS 1500 (AS-1500-ABG-INT) Airespace Access Point. This model contains internal 802.11a and 802.11b/g antennas and no connectors for optional external antennas.

ATTENTION!

While Airespace Access Points have been engineered for easy installation, there are some guidelines that are very important to the end users:

- PLACE Airespace Access Points NO MORE THAN 140 FEET APART FROM EACH OTHER. Placing Airespace APs further apart almost always results in poor coverage.

- DO NOT MOUNT Airespace APs OUTSIDE BUILDINGS.

- DO NOT MOUNT Airespace APs ON BUILDING PERIMETER WALLS UNLESS THE OPERATOR WANTS TO PROVIDE COVERAGE OUTSIDE THE BUILDING.

- MAKE SURE that plenum-mounted Airespace APs are powered using Power Over Ethernet (PoE) and use only the metal brackets (not the Ceiling-Mount Base or the Hanging-Ceiling Clips) to comply with safety regulations.

- MAKE SURE THAT THE Airespace Access Points ARE INSTALLED VERTI-CALLY. Airespace Access Points ARE DESIGNED TO BE INSTALLED VERTICALLY, either standing up in a plenum or hanging from a ceiling, to create the largest coverage area per Airespace AP. Hanging the Airespace AP from the ceiling provides the best RF coverage.

- DO NOT MOUNT Airespace Access Point ANTENNAS WITHIN ONE METER (3 FT.) OF ANY METAL OBSTRUCTIONS. THE RF WAVES FROM Airespace Access Points ARE BLOCKED AND/OR REFLECTED BY METAL OBJECTS, such as metal HVAC ducts, conduit, pipes, bookcases, elevator shafts, stairwells, and metal walls.

Overview

This guide is designed to provide you with the information needed to mount AS 1500 Airespace Access Points (Airespace APs). Airespace APs are part of the innovative Airespace Wireless Enterprise Platform (Airespace System), and require no manual configuration after they are mounted.

This document assumes that Airespace AP locations have been selected and that you have one Airespace AP per indicated location.

After the site survey is done, you should have a map indicating the following:

- AP locations.

- AP power options: power supplied by the AC-to-DC power supply orderable from the factory, or Power over Ethernet (PoE) from a network device or a PoE injector/hub (usually located in a wiring closet).

    ► **Note:** Plenum-mounted Airespace APs MUST BE powered using Power Over Ethernet (PoE) to comply with safety regulations.

If you do not have a map, make one so you can record the MAC addresses from each location and return them to the to the person who is planning or managing this wireless network.

Refer to the following sections to install the Airespace APs.

    ► **Note:** When mounting Airespace APs, make sure to maintain a 20 cm (8 in.) separa-tion between the Airespace APs and bystanders to comply with FCC RF exposure regulations.

For more details about Airespace AP installations, refer to the *Planning Notes* section at the end of this document.

Step 1: Collecting Required Tools and Supplies

- One Airespace AP per location with included mounting clips.

- Optional Airespace AP Mounting Kits, factory-orderable.

- Optional external AC-to-DC power supplies, factory-orderable.

- Map showing Airespace AP locations and power options.

- Screwdrivers, drills, and ladder.

- CAT-5 (or higher) cables to connect the Airespace AP locations and the Airespace WLAN Controller or other network device.

Continue with *Step 2: Configuring the Airespace AP Before Installation*.

Step 2: Configuring the Airespace AP Before Installation

The following procedures are designed to make sure that your Airespace AP physical installation goes smoothly and that initial operation is as expected. If you are unable to prepare your Airespace AP for deployment, this Step also describes RMA (Return Material Authorization) procedures.

> ▶ **Note:** Perform the following procedure on each Airespace AP BEFORE deploying the Airespace AP in its final location.

Configuration Setup
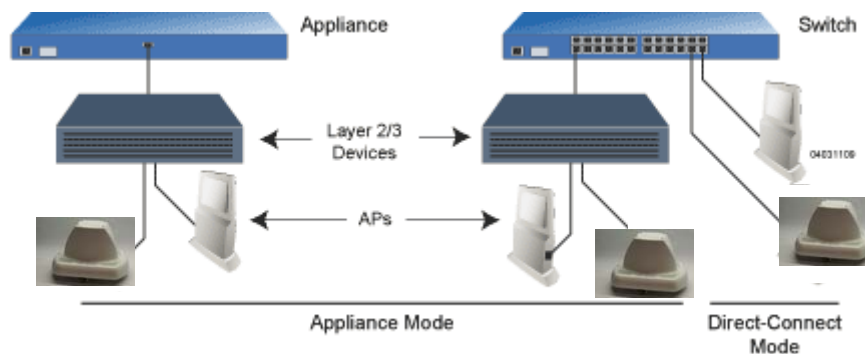
Configuration Steps for an Airespace AP

1. Configure the Airespace Controller for **LWAPP Layer 2 Mode** (use the CLI command *show switchconfig* to determine the mode; if it is set to layer 3, use the CLI command *config switch-config mode L2* to change it to Layer 2). Make sure the Airespace Controller DS Port is connected to the network.

    -   Make sure AP ports are available (either <u>Direct-Connect Mode</u> through the Switch physical ports, or in <u>Appliance Mode</u> through the Airespace Controller Management/ AP-Manager Interface).

    -   Set the Airespace Controller as the Master, so new Airespace APs always associate with it. Use the CLI command *show network config* to determine if the Airespace Controller DS Port is the Master. If it is not, make it the Master with the CLI command *config network master-base enable*. Make sure to use the CLI command *config network master-base disable* after you have configured the AP(s).

2. Take the Airespace AP out of the box and plug it into a front-panel 10Base-T connector on the Master Switch (<u>Direct-Connect Mode</u>), or through the same subnet that Airespace Controller is on (<u>Appliance Mode</u>).

3. Apply power to the AP:

    -   Use 802.3af-compatible Power Over Ethernet (PoE) from the Airespace Controller or from an orderable inline power injector. If you do not have PoE available, use an orderable external AC-to-48 VDC Power Supply plugged into the side of the AP.

    -   After powering up the AP, the RED Alarm LED comes on for a short period (about 15-20 seconds) and then all the LEDs blink sequentially back and forth, indicating that the AP is trying to connect to an Airespace Controller. This can continue for up to five minutes. If the AP remains in this mode for more than five minutes, the AP is unable to find the Master Airespace Controller. Check the connection between the AP and the Airespace Controller and make sure the Airespace AP and the Airespace Controller are on the same subnet.

- If the Power light does not come on, check the power (it can be powered either with Power over Ethernet or a from an orderable AP External Power Supply.

- Make sure that a DHCP server is configured in the Airespace Controller for both the Management Interface and AP-Manager Interface using the CLI, Web Browser, or ACS interface, and that the DHCP server is operating correctly.

- Once the AP finds the Airespace Controller, it attempts to download the new Airespace Operating System code if the AP code version differs from the Airespace Controller code version. While this is happening, the LEDs on the top of the AP blink on and off together.

4. Once the Airespace Operating System code download is successful, the AP reboots. The GREEN LED turns on and the two AMBER/AMBER LEDs indicate the states of the 802.11a and 802.11b/g networks. If a AMBER/AMBER LED remains off.

   - Note that the Red LED can light for a short period (10-20 seconds) when the AP reboots. If the RED LED comes on AND STAYS ON for more than a minute, disconnect the AP and call Airespace Global Services & Support.

   - Use the CLI command *show ap summary*. If the new AP appears on the list, it has been configured successfully.

   - From the CLI, Web Browser or ACS interface, configure the AP with its Primary, Secondary and Tertiary Airespace Controller names.

   - If you will be using the AP in a mobility or a WPS group, set the mobility or WPS group name using the CLI, Web Browser or ACS interface.

   - If required, use the CLI, Web Browser or ACS interface to customize the AP-specific 802.11a, 802.11b and 802.11g network settings. Once again, the two AMBER/AMBER LEDs indicate the states of the 802.11a and 802.11b/g networks. If any part of the network is disabled, the corresponding AMBER/AMBER LED remains off.

5. If everything works correctly (the GREEN LED is on and the RED LED is off), disconnect the Airespace AP and take it to its final destination and install it as described in this document. If your Airespace AP fails this visual test, contact Global Services & Support to return your Airespace APs.

6. When you have installed and powered up the Airespace AP in its final destination, verify that the LEDs are in the same state they were in at the end of Step 4.

   - If no LEDs are on, the AP is most likely not receiving power.

   - If the LEDs blink sequentially back and forth for more than five minutes, the Airespace AP is unable to find its Primary, Secondary or Tertiary Airespace Controller. Check the connection between the Airespace AP and the Airespace Controller, and make sure the AP and the Airespace Controller are either on the same subnet or that the AP has a route back to its Primary, Secondary and Tertiary Airespace Controllers.

   - If the Airespace AP is not on the same subnet as the Airespace Controller, make sure there is a DHCP server on the same subnet as the Airespace AP. Also, make sure that the route between the Airespace AP and the Airespace Controller can process IP fragmented packets.

After you have prepared all Airespace APs, reconfigure the Airespace Controller so it is not the Master. A Master Airespace Controller should only be used for configuring Airespace APs and not in a working network. Note that the Master Airespace Controller is normally not used in a deployed network, so the Master Airespace Controller setting is automatically disabled upon reboot or AireOS code upgrade.

After completing *Step 2: Configuring the Airespace AP Before Installation* for all Airespace APs and REAPs, continue with *Step 3: Preparing Mounting Locations*.

Step 3: Preparing Mounting Locations

On your map, you should have the Airespace AP locations, mounting options, and power options.

> ▶ **Note:** MAKE SURE that plenum-mounted Airespace APs use only the metal Projection-Mount and Flush-Mount brackets (not the Hanging-Ceiling Clips) and are powered using Power Over Ethernet (PoE) to comply with safety regulations.

- Find the required mounting locations.

Figure - Factory-Supplied Mounting Clips
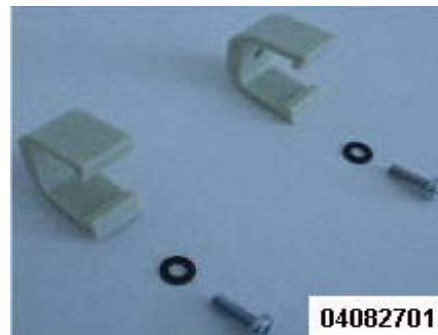
- Attach the hanging ceiling clips to the Airespace AP. Make sure you leave enough space around the Airespace AP to plug the CAT-5 cable, optional external antenna cable(s), optional power supply cable, and optional Kensington MicroSaver Security Cable into the sides of the Airespace AP.

- Alternatively, use the optional mounting bases and/or brackets to mark the wall or ceiling locations for sheet metal, drywall, or other screws. Make sure you leave enough space around the Airespace AP and brackets to plug the CAT-5 cable, optional external antenna cable(s), optional power supply cable, and optional Kensington MicroSaver Security Cable into the sides of the Airespace AP.

Figure - Factory-Orderable Mounting Brackets

TBD

- If necessary, drill holes for the various cables where they can be mostly hidden from casual view. When you are mounting the Airespace AP using an optional separately-orderable

projection-mount L-bracket (the one with two long legs), the cables can be routed through the 5/8-inch (15.9 mm) holes in the bracket.

- Route the CAT-5, optional power supply, optional external antenna cable(s), and optional Kensington MicroSaver Security cables to where they can plug into the Airespace AP. Make sure to leave about 6 inches (15 cm) of slack in the cables for future modifications.

- Attach the brackets to the wall or ceiling, or install screws for ceiling-mount base:

  - Where you are going to use the projection-mount or flush-mount bracket, use customer-supplied sheet metal, drywall, or other screws to attach the bracket to the ceiling or wall.

- Where you are going to use the ceiling-mount base, install customer-supplied sheet metal, drywall, or other screws with 1/4 inch (6.35 mm) or smaller heads protruding from the ceiling about 0.1 inch (2.5 mm).

- If necessary, drill holes for the various cables where they can be mostly hidden from casual view.

- Route the CAT-5, optional power supply, optional external antenna cable(s), and optional Kensington MicroSaver Security cables to where they can plug into the Airespace AP. Make sure to leave about 6 inches (15 cm) of slack in the cables for future modifications.

You are now ready to install the Airespace APs. Continue with *Step 4: Mounting the Airespace APs*.

Step 4: Mounting the Airespace APs

Using the supplied or optional separately-orderable Airespace AP mounting kits, mount each Airespace AP in its indicated location, oriented as shown on the map. Note that you can mount the Airespace APs in the ceiling plenum or below the ceiling, but the Airespace APs perform best when mounted below the ceiling.

The Airespace APs can be mounted in one of three configurations:

- *Ceiling-Mount Clips*

- *Projection Wall Mount*

- *Flush Wall Mount*

Ceiling-Mount Clips

When you are mounting the Airespace AP on the extruded aluminium rails of a hanging ceiling, use the ceiling-mount clips to mount the Airespace AP as shown in the following figure and as described below:

Figure - Airespace AP with Ceiling-Mount Clips Installed

- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 000B85xxxxxx.

- Attach the ceiling-mount clips to the bottom of the Airespace AP using the factory-supplied machine screws and washers.

- Snap the ceiling-mount clips onto a hanging ceiling rail.

Figure - Clipping the Airespace AP and Ceiling-Mount Clips to a Hanging-Ceiling Rail

04082703

- Attach the cables to the sides of the Airespace AP.

  ► **Note:** Make sure the cables are routed away from the Airespace AP antennas.

You have installed the Airespace AP. Repeat *Step 4: Mounting the Airespace APs* for each Airespace AP location, and then continue with *Step 5: Returning MAC Information*.

Projection Wall Mount (Details TBD)

When you are mounting the Airespace AP out from a wall (flat sides along the wall or hallway), use an optional factory-orderable projection-mount L-bracket.

- Before proceeding, gently screw the two factory-supplied screws and spring washers into the bottom of the Airespace AP. Make sure the spring washers have their convex (high center sections) pointing toward the screw heads.

  ► **Note:** The Airespace AP threaded holes have precision-depth threads. Do not over-tighten the screws, or the bracket will not fit under the screw heads.

Figure - Assembling the Mounting Screws and Spring Washers to the Airespace AP

TBD

- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 000B85xxxxxx.

- You have already attached the projection-mount L-bracket to the wall in *Step 3: Preparing Mounting Locations*.

- Slide the screws into the keyhole slots on the mounting bracket as shown in the following figure.

  ▶ **Note:** If the screws do not securely hold the bracket, remove the Airespace AP and adjust the screws until they securely hold the bracket.

Figure - Assembling the Airespace AP to the Projection-Mount Bracket

TBD

- Attach the cables to the sides of the Airespace AP.

  ▶ **Note:** Make sure the cables are routed away from the Airespace AP antennas.

You have installed the Airespace AP. Repeat *Step 4: Mounting the Airespace APs* for each Airespace AP location, and then continue with *Step 5: Returning MAC Information*.

Flush Wall Mount (Details TBD)

When you are mounting the Airespace AP against a wall (flat side toward the inside of the building), use an optional separately-orderable flush-mount bracket.

- Before proceeding, gently screw the two factory-supplied screws and spring washers into the bottom of the Airespace AP. Make sure the spring washers have their convex (high center sections) pointing toward the screw heads.

  ▶ **Note:** The Airespace AP threaded holes have precision-depth threads. Do not over-tighten the screws, or the bracket will not fit under the screw heads.

Figure - Assembling the Mounting Screws and Spring Washers to the Airespace AP

TBD

- Copy the MAC address(es) from the label(s) on the Airespace AP onto the corresponding location on the map. MAC addresses have the format 000B85xxxxxx.

- You have already attached the flush-mount bracket to the wall in *Step 3: Preparing Mounting Locations*.

- Slide the screws into the keyhole slots on the mounting bracket as shown in the following figure.

    ▶ **Note:** If the screws do not securely hold the bracket, remove the Airespace AP and adjust the screws until they securely hold the bracket.

Figure - Assembling the Airespace AP to the Flush-Mount Bracket

TBD

- Attach the cables to the sides of the Airespace AP.

> **Note:** Make sure the cables are routed away from the Airespace AP antennas.

You have installed the Airespace AP. Repeat *Step 4: Mounting the Airespace APs* for each Airespace AP location, and then continue with *Step 5: Returning MAC Information*.

Step 5: Returning MAC Information

When you have completed the installations as outlined in *Step 4: Mounting the Airespace APs*, return the MAC addresses and their locations on the maps or floor plans to the network planner or manager. The Airespace Control System Software (ACS Software) operators will use the MAC address and location information to create maps for precise wireless Airespace Operating System management.

Also return any unused mounting clips and external power supplies to the network planner or manager for use in future deployments.

> **Note:** Please remind the Network Planner or Manager that now is a good time to register the Airespace APs at *http://www.airespace.com/*.

Planning Notes

About Cables

- You will run one CAT-5 Ethernet cable from the Airespace AP to the Airespace WLAN Controller, another network device, or a PoE injector/hub.

  When the Airespace AP will be mounted below the ceiling using the ceiling mount or wall mount brackets, you may have to drill a hole into the ceiling plenum to run the CAT-5 cable to the wiring closet. When the CAT-5 cable cannot be run through the ceiling plenum, find another path to route the cable from the Airespace AP to the wiring closet.

  When the Airespace AP will be mounted above the ceiling using the ceiling mount or wall mount brackets, run the CAT-5 cable to the wiring closet through the ceiling plenum. When the CAT-5 cable cannot be run through the ceiling plenum, find another path to route the cable from the Airespace AP to the wiring closet.

- When you are powering the Airespace AP from AC power, route the power supply cable from the AC convenience outlet to the Airespace AP. Make sure you secure the AC power plug so it will be difficult for people to pull on the power cord or unplug the power supply from the AC power outlet.

- When you are powering the Airespace AP from a PoE source (Airespace WLAN Controller, another network device, or a PoE injector/hub), you do not need to route a separate power cable to the Airespace AP, because the Airespace AP will receive its power across the CAT-5 Ethernet cable. Return the power supply to the wireless network planner/manager.

About External Antennas

- The AS-1500-ABG-INT AP is designed to be used exclusively with the internal high-gain antennas, and have no provisions for external antennas.

About Mounting Options

> **Note:** Because the Airespace AP internal antennas have been designed to reduce inter-floor interference, it is strongly recommended that you mount the Airespace AP standing or hanging straight up or down.

About Physical Security (Details TBD)

The Airespace AP can be secured with a Kensington MicroSaver Security Cable. If required, use any MicroSaver Security Cable to attach either side of your Airespace AP to a solid beam, pipe, or support.

FCC Statements for Airespace APs

This section includes the following FCC statements for the Airespace AP:

- *Class A Statement*
- *RF Radiation Hazard Warning*
- *Non-Modification Statement*
- *Deployment Statement*

Class A Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Radiation Hazard Warning

To ensure compliance with FCC RF exposure requirements, this device must be installed in a location such that the antenna of the device will be greater than 20 cm (8 in.) from all persons. Using higher gain antennas and types of antennas not covered under the FCC certification of this product is not allowed.

Installers of the radio and end users of the Airespace Wireless Enterprise Platform must adhere to the installation instructions provided in this manual.

Non-Modification Statement

Use only the supplied internal antenna, or external antennas supplied by the manufacturer. Unauthorized antennas, modifications, or attachments could damage the badge and could violate FCC regulations and void the user's authority to operate the equipment.

Deployment Statement

This product is certified for indoor deployment only. Do not install or use this product outdoors.

Specifications

Parameter	Value
Operational Modes	802.11b/g 802.11a
Frequency Bands: • 802.11b/g • 802.11a	 2412 - 2462 MHz 5180 - 5320 MHz, 5745 - 5805 MHz
DC Power	PoE: IEEE 802.3af-2003 48 VDC jack
Dimensions	6.5" x 8.5" x 5.5"
Weight	1.5 lbs. (0.7 kg)

Mounting	• Ceiling T-bar mount • Wall mount option
Security	Kensington Lock
External Interfaces: • RJ-45 • DC Power Jack	 Single, 10/100 Ethernet with PoE Single, 2.5 mm
LEDs • Power/Alarm • 2.4 GHz Radio • 5 GHz Radio • 10/100BASE-T	 green/red amber amber amber/green
DC Supply Requirements	• PoE: 48 VDC, 13 Watts • DC Jack: 48 VDC, 13 Watts
Operating Temperature	0 to +50 deg C
Storage Temperature	-25 to +70 deg C
Humidity	0-95%, non-condensing

Safety Considerations

The 1500 Airespace APs with or without external antenna ports are only intended for installation in Environment A as defined in IEEE 802.3af. All interconnected equipment must be contained within the same building including the interconnected equipment's associated LAN connections.