



**MOTOROLA**

*Home & Networks Mobility*

APPLICANT: MOTOROLA

FCC ID: IHET7HN1

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# Users Manual Exhibit

## 2.5GHz Diversity Access Point

# Access Point Hardware Installation

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# **Access Point Hardware Installation**

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This manual contains general information and procedures for shipping and handling, site preparation, installation, and site clean up of the Access Point (AP) hardware.



## Revision history

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### Version information

The following shows the status of this document since it was first released.

Document issue	Date of issue	Remarks
1	5/30/06	DRAFT
2	7/10/06	DRAFT Update 1
3	8/14/06	DRAFT Update 2
4	9/27/06	DRAFT Update 3
5	10/26/06	DRAFT Update 4
6	1/05/07	DRAFT Update 5
7	03/20/07	PRELIMINARY
8	05/02/07	PRELIMINARY — Updated with UL information

### Resolution of Service Requests

The following Service Requests are resolved in this document:

Service Request	CMBP Number	Remarks
NA	NA	Initial release

### Incorporation of Change Notices

The following Change Notices (CN) are incorporated in this document:

CN Date	CN Number	Title
NA	NA	NA

## General information

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### Purpose

Motorola cellular communications documents are intended to instruct and assist personnel in the operation, installation and maintenance of the Motorola cellular infrastructure equipment and ancillary devices. It is recommended that all personnel engaged in such activities be properly trained by Motorola.

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#### NOTE

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### Cross references

References made to external publications are shown in italics. Other cross references, emphasized in blue text in electronic versions, are active links to the references.

This document is divided into numbered chapters that are divided into sections. Sections are not numbered, but are individually named at the top of each page, and are listed in the table of contents.

## Text conventions

The following conventions are used in the Motorola cellular infrastructure documents to represent keyboard input text, screen output text, and special key sequences.

### Input

Characters typed in at the keyboard are shown like this.

Items of interest within a command appear like this.

### Output

Messages, prompts, file listings, directories, utilities, and environmental variables that appear on the screen are shown like this.

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## Special key sequences

Special key sequences are represented as follows:

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<b>CTRL-SHIFT-c or CTRL+SHIFT+C</b>	Press the <b>Ctrl</b> , <b>Shift</b> , and <b>C</b> keys at the same time.
<b>ALT-f or ALT+F</b>	Press the <b>Alt</b> and <b>F</b> keys at the same time.
<b>ALT+SHIFT+F11</b>	Press the <b>Alt</b> , <b>Shift</b> and <b>F11</b> keys at the same time.
<b> </b>	Press the pipe symbol key.
<b>RETURN or ENTER</b>	Press the <b>Return</b> or <b>Enter</b> key.

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## Security advice

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Motorola systems and equipment provide security parameters that can be configured by the operator based on their particular operating environment. Motorola recommends setting and using these parameters following industry recognized security practices. Security aspects to be considered are protecting the confidentiality, integrity, and availability of information and assets. Assets include the ability to communicate, information about the nature of the communications, and information about the parties involved.

In certain instances, Motorola makes specific recommendations regarding security practices. The implementation of these recommendations and final responsibility for the security of the system lies with the operator of the system.

Contact the Customer Network Resolution Center (CNRC) for assistance. The 24-hour telephone numbers are listed at <https://mynetworksupport.motorola.com>. Select **Customer Network Resolution Center contact information**, from the menu located to the left of the Login box. Alternatively if you do not have access to CNRC or the internet, contact the Local Motorola Office.

## Warnings, cautions, and notes

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The following describes how warnings and cautions are used in this document and in all documents of this Motorola document set.

### Warnings

Warnings precede instructions that contain potentially hazardous situations. Warnings are used to alert the reader to possible hazards that could cause loss of life or physical injury. A warning has the following format:



Warning text and consequence for not following the instructions in the warning.

### Cautions

Cautions precede instructions and are used when there is a possibility of damage to systems, software, or individual items of equipment within a system. However, this damage presents no danger to personnel. A caution has the following format:



Caution text and consequence for not following the instructions in the caution.

### Notes

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Note text.

# Safety

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## General safety

The following general safety guidelines apply to Motorola equipment:

- The power jack and mating plug of the power cable must meet International Electrotechnical Commission (IEC) safety standards.



### NOTE

Refer to *Grounding Guideline for Cellular Radio Installations – 68P81150E62*.

- Power down or unplug the equipment before servicing.
- Using non-Motorola parts for repair could damage the equipment or void warranty. Contact Motorola Warranty and Repair for service and repair instructions.
- Portions of Motorola equipment may be damaged from exposure to electrostatic discharge. Use precautions to prevent damage.

## Electromagnetic energy

Relevant standards (USA and EC) applicable when working with RF equipment are:

- *ANSI IEEE C95.1-1991, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.*
- Council recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (1999/519/EC) and respective national regulations.
- *Directive 2004/40/EC of the European Parliament and of the Council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (18th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).*

## Caring for the environment

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The following information describes national or regional requirements for the disposal of Motorola supplied equipment and for the approved disposal of surplus packaging.

Contact the Customer Network Resolution Center (CNRC) for assistance. The 24-hour telephone numbers are listed at <https://mynetworksupport.motorola.com>. Select **Customer Network Resolution Center contact information**. Alternatively if you do not have access to CNRC or the internet, contact the Local Motorola Office.

### In EU countries

The following information is provided to enable regulatory compliance with the European Union (EU) directives identified and any amendments made to these directives when using Motorola equipment in EU countries.



### Disposal of Motorola equipment

*European Union (EU) Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE)*

Do not dispose of Motorola equipment in landfill sites. In the EU, Motorola in conjunction with a recycling partner ensures that equipment is collected and recycled according to the requirements of EU environmental law.

### Disposal of surplus packaging

*European Parliament and Council Directive 94/62/EC Packaging and Packaging Waste*

Do not dispose of surplus packaging in landfill sites. In the EU, it is the individual recipient's responsibility to ensure that packaging materials are collected and recycled according to the requirements of EU environmental law.

### In non-EU countries

In non-EU countries, dispose of Motorola equipment and all surplus packaging in accordance with national and regional regulations.



## CMM labeling and disclosure table

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The People’s Republic of China require that our products comply with China Management Methods (CMM) environmental regulations. (China Management Methods refers to the regulation *Management Methods for Controlling Pollution by Electronic Information Products*.) Two items are used to demonstrate compliance; the label and the disclosure table.

The label is placed in a customer visible position on the product.

- Logo 1 means the product contains no substances in excess of the maximum concentration value for materials identified in the China Management Methods regulation.
- Logo 2 means that the product may contain substances in excess of the maximum concentration value for materials identified in the China Management Methods regulation, and has an Environmental Friendly Use Period (EFUP) in years, fifty years in the example shown.



The Environmental Friendly Use Period (EFUP) is the period (in years) during which the Toxic and Hazardous Substances (T&HS) contained in the Electronic Information Product (EIP) will not leak or mutate causing environmental pollution, or bodily injury from the use of the EIP. The EFUP indicated by the Logo 2 label applies to a product and all its parts. Certain field-replaceable parts, such as battery modules, can have a different EFUP and are marked separately.

The Disclosure table is intended only to communicate compliance with China requirements. It is not intended to communicate compliance with EU RoHS or any other environmental requirements.

## Motorola document set

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The Motorola document sets provide the information to operate, install, and maintain the Motorola equipment.

## Ordering documents and CD-ROMs

With internet access available, to view, download, or order documents (original or revised), visit the Motorola Lifecycles Customer web page at <https://mynetworksupport.motorola.com>, or contact your Motorola account representative.

Without internet access available, order hard copy documents or CD-ROMs with your Motorola Local Office or Representative.

If Motorola changes the content of a document after the original printing date, Motorola publishes a new version with the same part number but a different revision character.

## Document banner definitions

A banner (oversized text on the bottom of the page, for example, **PRELIMINARY — UNDER DEVELOPMENT**) indicates that some information contained in the document is not yet approved for general customer use.

## Data encryption

In order to avoid electronic eavesdropping, data passing between certain elements in the network is encrypted. In order to comply with the export and import requirements of particular countries, this encryption occurs at different levels as individually standardized, or may not be present at all in some parts of the network in which it is normally implemented. The document set, of which this document is a part, covers encryption as if fully implemented. Because the rules differ in individual countries, limitations on the encryption included in the particular software being delivered, are covered in the Release Notes that accompany the individual software release.

# Supplemental information

## Third Party computer software and trademarks

### Computer software

The following is a list of the 3rd party computer software copyrights contained within this Motorola product.

**1. Author Comment:**

*In the following table, insert the list of 3rd party computer software (usually open source or freeware) with the copyright date of the included software. The following is an example, your list may vary. The first row shows the format Check with the project leader for your document to get the appropriate list supplied by development.*

Company	Copyright
<Vendor name>	Copyright YYYY All Rights Reserved.
Apache Software Foundation*	Copyright 1999-2007 All rights reserved.

\* Publicly Available Software

### Trademarks

Java™ Technology and/or J2ME™: Java and all other Java-based marks are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.

UNIX® : UNIX is a registered trademark of The Open Group in the United States and other countries.

**2. Author Comment:**

*Insert contractual language here if needed.  
See <http://markit.mot.com/markit/markit.nsf/mainframepage>  
Login using your coreID and OneIT password.  
Select Guidelines>Trademark Attribution Statements.  
Check with the project leader for your document to get the appropriate list supplied by development.*

# FCC Requirements

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## Content

This section presents Federal Communications Commission (FCC) Rules Parts 15 and 68 requirements and compliance information for the (WAP25400) MOTOwi4™ Diversity Access Point .

## Radio Frequency exposure



### WARNING

This equipment is designed to generate and radiate radio frequency (RF) energy. It should be installed and maintained only by trained technicians. Licensees of the Federal Communications Commission (FCC) using this equipment are responsible for insuring that its installation and operation comply with FCC regulations (47 C.F.R. & 1.1310) designed to limit human exposure to RF energy.

## FCC Part 15 Requirements

### Part 15.19a(3) - Information to User



### NOTE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

## Part 15.21 - Information to User



### NOTE

Changes or modifications that change the FCC type approved configuration of the equipment could void the user's authority to operate the equipment.

## 15.105(b) - Information to User



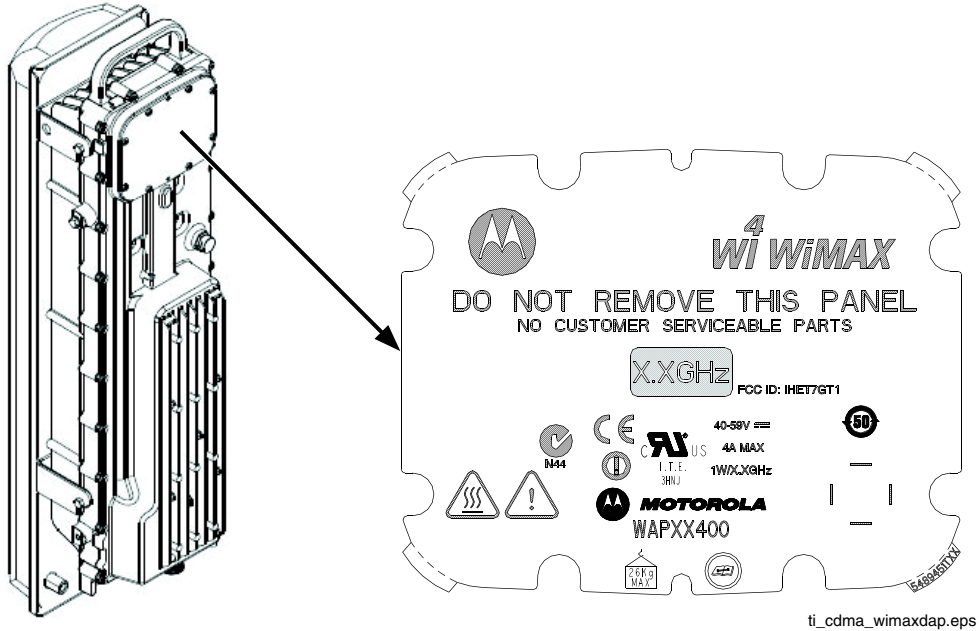
### NOTE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

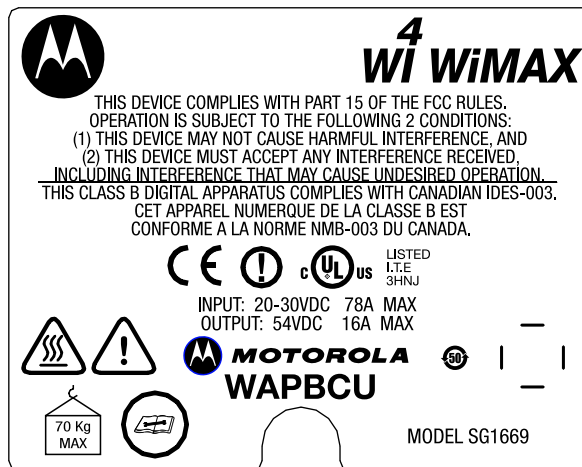
## DAP label and location

A label similar to the one illustrated is located as shown. All symbols may not display on the label depending on the market.



## BCU label

A label similar to the one illustrated is located on the equipment. All symbols may not display on the label depending on the market.





# Introduction

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# Introduction

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## Overview

This document provides information pertaining to the hardware and cabling installation for the outdoor version of the Motorola Access Point (AP) Hardware.

## Manual Order

The manual order outlines the content make up starting with Chapter 1 and continuing through Chapter 6. The appendices provide additional information about installation not otherwise covered in the chapters.

**Chapter 1** Overview - This is a brief outline of the manual. It also provides a list of additional documents and tools necessary to complete the procedures.

**Chapter 2** Site Preparation - This chapter contains the information for site verification and shipping and handling of the hardware.

**Chapter 3** Cable Descriptions — This chapter contains general information on the cabling available for the BCU and RF Head.

**Chapter 4** Access Point Hardware Installation — This chapter contains general information and procedures for installing the Base Control Unit (BCU) and RF Head.

**Chapter 5** Optional Equipment — This chapter contains general information and procedures for installing optional equipment.

**Chapter 6** What's Next - This chapter contains general information and procedures for site clean up and installation checklist.

**Appendix A** Alternate RF Head Installation Procedure- This appendix contains general information and alternate procedures for RF Head installation.

**Appendix B** Alternate RGPS Installation- This appendix contains general information and alternate procedures for RGPS installation.

**Appendix C** MMI Cable Fabrication — This appendix contains general information and a procedure for manufacturing an MMI cable if the SLN2006A Kit is not available.

## Product Description

The Access Point (AP) hardware is made up of two component assemblies: the BCU and the RF Head. The BCU contains the signal processing and interface hardware, and the RF Head contains the TX and RX components and BCU interface hardware.

## Recommended Documents

The following documents may be required to assist in the installation of the AP Hardware.

- Standards and Guidelines for Communication Sites
  - Hard copy (Motorola Part Number 6881089E50)
  - CD-ROM (Motorola Part Number 9882904Y01)
- Site Document (generated by Motorola Systems Engineering), which includes:
  - site specific documentation
  - channel allocation
  - contact list (customer)
  - ancillary/expendable equipment list
  - site wiring lists
  - contact list (Motorola support)
  - job box inventory
- Demarcation Document (Scope of Work agreement)
- Installation manuals for non-Motorola equipment (for reference purposes).

## Abbreviations and Acronyms

[Table 1-1](#) lists the uncommon abbreviations and acronyms that appear within the manual.

**Table 1-1** Abbreviations and Acronyms

<b>Term</b>	<b>Definition</b>
AP	Access Point
BCU	Base Control Unit
BCU I/O	Base Control Unit Input/Output
CBC	Circuit Breaker Card
DAC	Direct Air Cooling
DAP	Diversity Access Point
PSU	Power Supply Unit
RFCU	RF Carrier Unit
TRX	Transmit/Receive RF Module

# Tools and Materials

## Introduction

Many of the tools and materials depend on the style of the wall or pole on which the mounting bracket is being installed. The tools and materials required to install the BTS hardware are specified for each mounting style. Due to the variability of mounting styles, additional tools and materials may be required to meet specific site needs.

## Tools and Materials

The tools and materials listed in [Table 1-2](#) are recommended to properly and safely perform the various installation procedures. Not all the tools will be used in all the procedures.

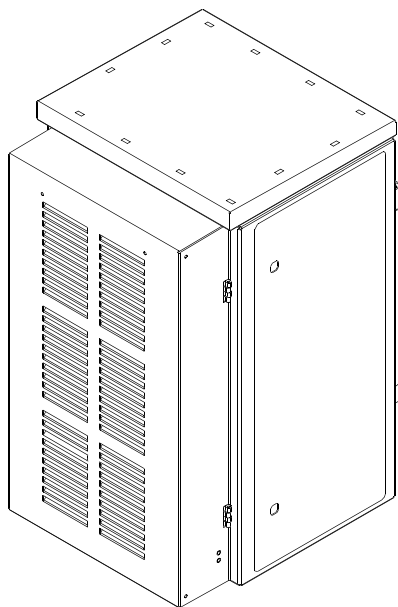
**Table 1-2** Tools and Materials

Hand Tool	Materials	Purpose
Adjustable Torque ratchet and metric/standard socket set	Customer Supplied	For general torquing of bolts and nuts.
Cordless Power Drill, 1/4-in or 3/8-in drive	Appropriate wood and masonry drill bits (Standard set may be adequate) Customer Supplied	Drill holes in wood and light concrete
Bucklestrap Cutting Tool	(Motorola P/N 6604809N01)	For the pole mounting brackets
Tape Measure	Customer Supplied	General purpose measurement
Tin Snips	Customer Supplied	General purpose metal cutting
Safety Glasses	Customer Supplied	Eye Safety
Knife or Box Cutter	Customer Supplied	General purpose cutting
13/16 Breakaway Torque Wrench 38-in. lb	Customer Supplied	N Connectors
Block and Tackle	Customer Supplied	Raising the RF Head
No. 2 Blade Screw Driver	Customer Supplied	General Purpose
Electrical Tape	Customer Supplied	General Purpose
Adjustable Crescent Wrench	Customer Supplied	General Purpose
T30 Torx Screw Driver	Customer Supplied	General Purpose
Tie-Wraps	Customer Supplied	General Purpose, varying lengths.
Crimp Tool	Customer Supplied	Ground wires

## Base Control Unit Hardware Identification

Figure 1-1 shows the BCU in an outdoor configuration.

**Figure 1-1** BCU

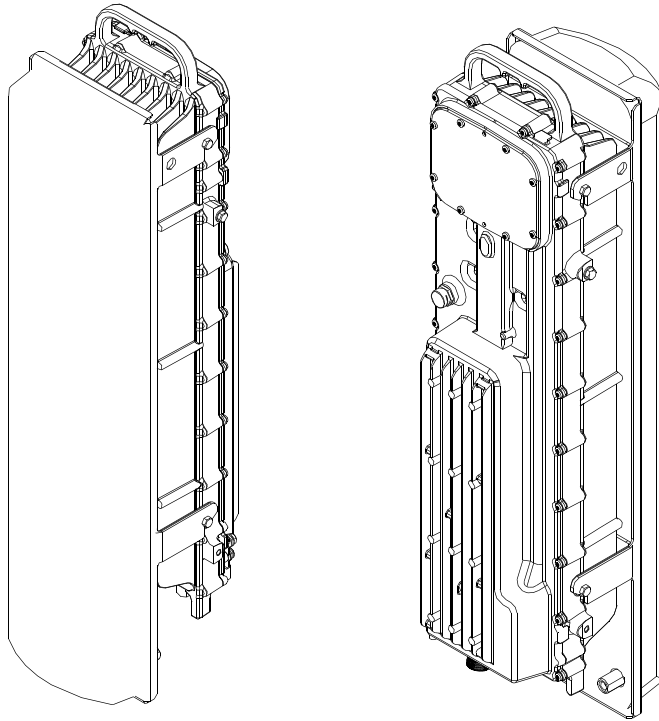


ti-cdma-04165.eps

## RF Head Hardware Identification

Figure 1-2 shows the DAP RF Head hardware.

**Figure 1-2** RF Head



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# Access Point Equipment Identification

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## Introduction

The Base Control Unit (BCU) consists of one shelf of cards and modules within a metal enclosure. The BCU is powered by AC or DC voltage.

## BCU Hardware Identification

Figure 1-3 displays the contents of the Base Control Unit (BCU). Except for the Mounting Bracket Assembly all the items shown are already installed in the BCU. The number of cards installed in the BCU card cage depends on the configuration that was ordered. Maximum number of cards in the BCU card cage is listed below:

- 1 — Alarms Card
- 1 — Circuit Breaker Card
- 4 — Modem Cards
- 2 — Controller Cards
- 3 — Power Supply Units

The I/O Panel is always installed and is located in the Customer Interface compartment.

Heater is installed when BCU is ordered