

## About This Book

The *Tsunami Multipoint Quick Install Guide*, *Installation Manual*, and *Reference Manual* comprise the Tsunami Multipoint Version 1.3 documentation set.

- The *Quick Install* provides just enough information for the experienced professional to install the Tsunami Multipoint system.
- This document, the *Installation Guide*, provides detailed installation information for the less experienced professional to install and initially configure the Tsunami Multipoint system.
- The *Reference Manual* provides conceptual, advanced configuration, and command reference information about the Tsunami Multipoint system. See the Reference Manual for information about:
  - Routing modes
  - Active Interference Rejection (A.I.R.)
  - Priority Queuing
  - Advanced Configuration Options
  - Command Reference
  - Troubleshooting

## Required Software and Firmware

The required software and firmware codes for this official release are:

- BSU Console Version 1.4 or Version 1.5
- Subscriber Utility 1.1 (packaged with Console V1.5)
- BSU Firmware Version 1.3 binary code, identified as **PMP\_BSU\_release1-3.mot**
- SU Firmware Version 1.3 binary code, identified as **PMP\_SU\_release1-3.mot**

## Safety Instructions

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**WARNING! IMPORTANT SAFETY INSTRUCTIONS: DO NOT DISCARD!**

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- Review this guide for important installation instructions BEFORE you attempt to install this product.
- This product is intended to be installed, used, and maintained by experienced telecommunications personnel only.
- This product has been evaluated to the U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, including Electrical Business Equipment, CAN/CSA C22.2, No. 950-95 \* UL 1950, Third Edition, including revisions through revision date March 1, 1998, which are based on the Fourth Amendment to IEC 950, Second Edition. In addition, this product was also evaluated to the applicable requirements in UL 1950, Annex NAE.

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**WARNING! This unit is intended for installation in accordance with Articles 110-18, 110-26, and 110-27 of the United States National Electric Code ANSI/NFPA 70; and per the applicable Articles in the Canadian Electric Code.**

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- This equipment must be installed in accordance with Article 810 of the United States National Electrical Code.
- Equipment is to be used with, and powered by, the power supplies provided only. A 15-Amp circuit breaker is required at the power source.
- Lightning surge protection is provided by the power supplies included with this product. Do not use any other devices for this purpose.

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**WARNING! This equipment is intended to be earthed. Use proper grounding methods. A 10 AWG earthing conductor at a minimum is to be used for this purpose.**

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- Do not connect or disconnect the power cable to the equipment when the power supply is plugged in an AC outlet.
- Servicing of this product should be performed by trained personnel only. Do not disassemble this product. By opening or removing any covers you may expose yourself to hazardous energy parts. Incorrect reassembly of this product can cause a malfunction, and/or electrical shock, when the unit is subsequently used.
- Do not insert any objects of any shape or size inside this product while powered. Objects may contact hazardous energy parts that could result in a risk of fire or personal injury.
- Do not spill any liquids of any kind on or inside this product.
- The maximum room ambient temperature (T<sub>mra</sub>) for this product is 55°C. Consideration should be given to installing this equipment in an environment compatible with the T<sub>mra</sub>.
- Equipment is suitable for mounting on concrete or other noncombustible surface only.
- Do not remove or alter the Marking label provided on this product.
- The Base Station Unit operates at -48Vdc/1 A. The Subscriber Unit operates at +28Vdc/0.6 A.

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## Chapter 1. Site Planning

The installation of a wireless network requires much the same basic planning as any wired network. The main difference is that the wireless signal requires some additional planning. This planning includes RF path planning, site preparation, and installation of outdoor components, such as outdoor units, antennas, lightning protection devices, and cabling suitable for outdoor conditions.

Although the technology implemented in this broadband fixed wireless system can make use of multi-path signals to reduce the effect of obstructions in the path, the characteristics of the path must be carefully examined. With this knowledge, components and network requirements can be correctly planned for your specific application.

This section provides insight into the planning necessary to prepare your site for your broadband fixed wireless system.

### General Considerations

A basic consideration is the physical location of the sites at each end of the link. Because microwave signals travel in a straight line, a clear line-of-sight between antennas is ideal. Frequently, however, the locations of the desired links are fixed. When you cannot achieve a clear line-of-sight, you must plan accordingly.

Other general site considerations include:

- Whether a tower must be constructed (and whether permits are required)
- Possibility of future obstructions
  - Will trees grow high enough to interfere with the signal? Are there plans to erect buildings between the sites that may obstruct the path?
- Availability of grounding
  - Good grounding is important. Also, in areas prone to lightning, a lightning arrestor is strongly recommended.
- Distance between the indoor portion of the system and the user's network.
- Whether the SU may potentially be served by different BSUs. Prior to installation, try to determine the best BSU access and available sighting location.
- Whether strong RF interference exists in the neighborhood, within or adjacent to the operating frequency.

The following sections are provided to help you determine which information is critical to your site, and to aid in the decision-making process.

## Specific Considerations

### Weather

You should research any unusual weather conditions common to the site location. These conditions can include excessive amounts of rain, wind velocity, or extreme temperature ranges. If extreme conditions exist that may affect the integrity of the radio link, take these conditions into consideration early in the planning process.

### Rain

Except in extreme conditions, attenuation (weakening of the signal) due to rain does not require serious consideration for frequencies up to the range of 6 GHz. When microwave frequencies are at the 10-12 GHz range or higher, attenuation due to rain becomes much more of a concern, especially in areas where rainfall is of high density and long duration. The systems discussed in this manual operate at frequencies below 6 GHz, so rain is not a concern.

### Temperature

Temperature can adversely affect the radio link when phenomena such as temperature inversion or very still air accompanied by stratification occur. Temperature inversion can negate clearances; still air, along with stratification, can cause severe refractive or reflective conditions, with unpredictable results.

Temperature inversions and stratification can also cause ducting, which may increase the potential for interference between systems that do not normally interfere with each other. Where these conditions exist, you should use shorter paths and adequate clearance.

### Wind

Any system components mounted outdoors are subject to the effect of wind. You should know the direction and velocity of the wind common to the site. Antennas and their supporting structures must be able to prevent these forces from affecting the antenna or causing damage to the building or tower on which the components are mounted. Antenna designs react differently to wind forces. This is known as *wind loading*.

### BSU and SU Wind Loading

Maximum operational wind speed during operation of BSUs and SUs is 50 m/s (112mph).

Survivable wind speed (tested to equivalent speed) is 90m/s (200mph).

The wind loading effect of the BSU and SU on their respective mounting masts is provided in Figure 1 (BSU) and Figure 2 (SU). The units of force in pounds can be converted to metric units by multiplying by