



data communications

Site Survey and Antenna Alignment Guide

AirMux-200



AirMux 200 Family

Site Survey and ODU Alignment Guide

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International Headquarters RAD Data Communications Ltd. 24 Raoul Wallenberg St. Tel Aviv 69719 Israel Tel: 972-3-6458181 Fax: 972-3-6498250 E-mail: market@rad.com	U.S. Headquarters RAD Data Communications Inc. 900 Corporate Drive Mahwah, NJ 07430 USA Tel: (201) 529-1100, Toll free: 1-800-444-7234 Fax: (201) 529-5777 E-mail: market@radusa.com
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General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective earth terminal. If an earth lug is provided on the product, it should be connected to the protective earth at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in earthed racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

Connection of AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

Installing the Outdoor Units (ODUs)

The following safety measures apply when installing the outdoor units and masts.

- Mast / pole / towers should comply with local standards such as BS6651.
- Only trained professional installers should install or dismantle outdoor units and masts. The installer is responsible for meeting all building and safety codes.
- Before installing a terminal, make sure it is disconnected from the power.
- A safety belt and climbing harness must be used when installing the outdoor units on a mast or tower.
- Masts of height 3 meters or more must be guyed according to required industry standards and be lightning protected.
- If an outdoor unit is to be mounted at a height of more than 4 meters above the roof, it is recommended that a climbable tower be installed to give access to the equipment and to prevent ODU movement during strong winds.
- When installing equipment, beware of overhead high-voltage power lines. Never install a mast under power lines.
- The mast structure must be grounded.
- Do not stand in front of a live outdoor unit.
- The installer should configure the output power level according to country regulations and per ODU type.
- The ODU used for this transmitter must be installed to provide a separation distance of at least 200 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.



Outdoor units and antennas should be installed ONLY by experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities. Failure to do so may void the warranty and may expose the end user or the service provider to legal and financial liabilities. RAD and its resellers or distributors are not liable for injury, damage or violation of regulations associated with the installation of outdoor units or antennas.

Protection against Lightning Activity

Observe the following safety measures to protect personnel and equipment:

- All outdoor equipment must be attached to a properly grounded structure, and installed masts must be grounded, in order to provide protection against lightning, surges and static buildup. In addition, mast over 3 meters should have a lightning protection rod. Failure to do so creates a safety risk and will void the equipment warranty.
- Do not work on the system or connect or disconnect the cables prior to or during electrical storm activity.
- In case of an electrical storm, do not touch any outdoor electrical equipment and leave the roof as quickly as possible.

Contents

Chapter 1. Site Survey

1.1	Introduction	1-1
1.2	Recommended Equipment.....	1-2
	Stage 1: Preliminary Survey	1-2
	Stage 2: Physical Survey	1-2
	Stage 3: RF Survey.....	1-2
1.3	Performing a Preliminary Survey	1-3
1.4	Performing a Physical Survey	1-4
1.5	Performing an RF Survey	1-5
	Test Set up	1-6
	Mapping an Overall Wireless Picture	1-7
	Testing Channel Purity.....	1-8

Chapter 2. Antenna Alignment

2.1	Introduction	2-1
2.2	Expected Signal Level	2-2
2.3	Performing AirMux-200 Alignment	2-2
	Aligning with the ODU beeper	2-2
	Aligning with the AirMux Manager.....	2-3
2.4	Configuring the Link	2-4
2.5	Evaluating the Link	2-5
2.6	Troubleshooting	2-5

Appendix A. Fresnel Zone

Appendix B. Site Evaluation Form

Appendix C. RF Survey Forms

Table of Contents

Chapter 1

Site Survey

1.1 Introduction

AirMux wireless networks need planning before installing the system. The required installation site must be appraised to determine that the wireless system is able to operate efficiently and provide coverage without signal degradation.

AirMux offers a wide operating frequency range, but a traffic-free (pure) frequency channel must be determined within the operating range, for optimum performance. If the network frequency chosen overlaps with a previously installed network, there is degradation of service and data integrity for both networks.

The aim of the Site Survey is to determine the best conditions for the AirMux installation, and to find a traffic-free operating frequency.

Chapter 2 explains the alignment details once the optimum conditions have been determined.

The Site Survey consists of three stages:

1. **Preliminary survey** – Analyze the link based on a topographic map (office)
2. **Physical survey** – Determine locations for the AirMux indoor (IDU) and outdoor (ODU) equipment (on site)
3. **Radio Frequency (RF) survey** – Using a spectrum analyzer, scan the installation area to identify RF interference and determine a clear channel for AirMux installation (on site).

1.2 Recommended Equipment

Stage 1: Preliminary Survey

- Topological map of the area
- Urban map of the area
- Compass.

Stage 2: Physical Survey

- 100 meter tape rule
- Ohmmeter, to check ground connection
- Site Evaluation Form (see [Appendix B](#))
- GPS device (optional)
- Binoculars
- Compass (optional)
- Map
- Digital camera
- Paper, pencil, and a clipboard

Stage 3: RF Survey

- Spectrum Analyzer (SA) with Max Hold function and screen capture facility that can store multiple images, for documentation purposes
- AirMux ODU or another test ODU with known parameters of gain, bandwidth and frequency range
- RF accessories (connectors and cables)
- RF Survey Form (see [Appendix C](#))
- Communication devices (for example, cellular phones, or a set of walkie-talkies).

1.3 Performing a Preliminary Survey

A preliminary survey is necessary so that you are prepared before going out to the potential installation site. As much detail as possible needs to be found about the two required ODU installation sites and the area between them.

1. Mark the two required installation sites on a topographic map of the area.
Draw a pencil line on the map, connecting the two installation sites.
2. Measure the distance between the sites, verify that it is within the specified range of the AirMux-200.
3. On the urban map, determine any developed areas situated between the two installation sites.
Pay attention to these areas when performing the physical site survey; there may be tall buildings, RF towers, or transmitters, which could cause interference in the region.
4. Check the area between the two sites for obstructions such as:
 - high areas – hills or mountains
 - the highest topographic point between the two sites
 - lakes or large bodies of water.
Water has a reflection effect on RF signals. Like from a building, this phenomenon of reflection causes the received amplitude to be reduced.
5. Determine and record the compass reading for each ODU, relative to north.
6. If there are obstructions between the two sites, calculate the Fresnel Zone. See [Appendix A](#) for details.
7. Decide on one or more possible site options.
8. When you find a potential site, get permission from the site manager to visit the site.
9. Use the Link Budget Calculator (found on the CD-ROM supplied with the AirMux-200) to determine the expected performance of the AirMux-200 system.
10. Fill out the Site Evaluation Form in [Appendix B](#) and the RF Survey Form for your AirMux version. See [Appendix C](#) of this document.
Use the form that refers to the AirMux-200 version you are installing:

- For AirMux-200/f58, see [Table C-1](#)
- For AirMux-200/f52, see [Table C-2](#)
- For AirMux-200/f24, see [Table C-3](#)

1.4 Performing a Physical Survey

The physical site survey reviews the physical environment where the AirMux-200 installation is required to ensure that the site is physically suitable for the AirMux-200 wireless network. Record the results of the physical site survey on the Site Evaluation Form (see [Appendix B](#)).

Notes

The site survey is performed outdoors, so be suitably dressed for the weather. If performing a site survey on the top of a building, it can be very windy. It is advisable to go on a clear day, so you can more easily see any obstructions between the two sites.

To perform a physical survey:

1. From the compass readings taken in the preliminary survey, find the azimuth (horizontal position) that the ODU should face towards the second AirMux ODU.
2. Using binoculars, locate any obstructions such as tall trees, high buildings, hills or mountains. Look for other RF towers between the two sites.
Mark the locations of the obstructions on the map.
3. Determine the location for the ODU. It should be above any obstructions, considering the Fresnel zone (see [Appendix A](#)).
4. If you need to install the ODU on a tower, make sure that the tower is far away from overhead electric power lines, to avoid risk of electric shock.
5. Determine a location for the indoor equipment; it should be as close as possible to the ODU. At an existing site, there is probably an equipment room with cable-routing channels.

Note

The cable length limit is 100m, in accordance with 10/100BaseT standards.

6. Measure and record the path length of the cable from the ODU position to the indoor equipment room.
7. Determine the ground connection point of the installation. The AirMux-200 ODU must be connected to ground.

8. Measure, using the Ohmmeter, and record the resistance of the required installation to the grounding point.
The resistance must be less than 1Ω .
9. Complete the Site Evaluation Form in [Appendix B](#).
10. Review the results of the physical site survey.
Decide if the site is physically suitable for the AirMux-200 wireless network installation.
 - If the site is suitable, continue with stage 3, the RF survey.
 - If the site is not suitable, survey another site.

1.5 Performing an RF Survey

The RF survey examines the wireless environment of the AirMux-200 installation site, to determine whether there are available channels within the AirMux-200 operating frequency band. An RF survey is performed using a spectrum analyzer.

It is advisable to familiarize yourself with the Spectrum Analyzer before going out on site, specifically the **Max Hold** and **Marker** functions.

Perform the RF survey at both sites (A and B) where you want to install the AirMux-200 ODU.

Make the survey in a busy time of day, to best judge the worst-case signal traffic. Allow 2–4 hours duration for a good RF survey.

The aim of the RF Survey is to:

- Acquire an overall spectral picture of the area where you intend to install the AirMux.
- Perform measurement and mapping of the current busy frequencies and signal levels in the area, particularly of the important spectral areas (see [Figure 1-1](#))
- Find the best ODU polarization for the installation.
- Find available pure channels so that you can efficiently operate the AirMux wireless system.

Note

It is possible to install the AirMux-200 link and use the AirMux Manager to find a pure channel. Each frequency channel can be evaluated in turn, and only when the expected RSS is reached, then a pure channel is found.

Test Set up

Figure 1-1 shows the test setup for the RF site survey. The test setup includes:

- Survey ODU (AirMux or similar)
- Spectrum Analyzer
- RF cable with known loss.

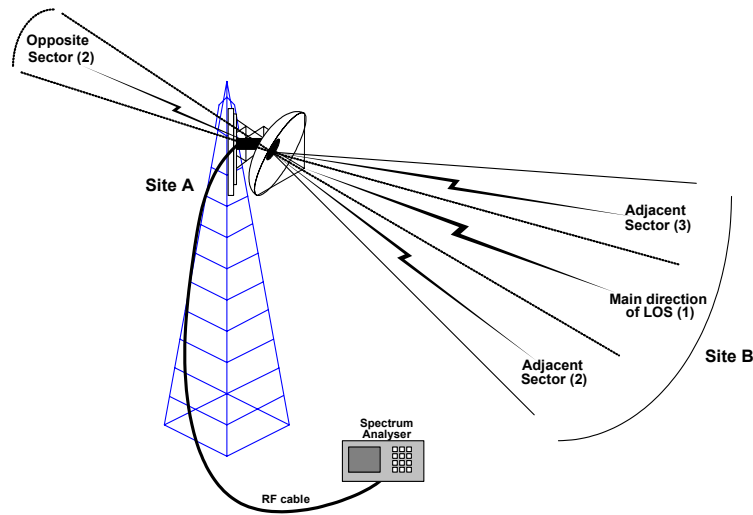


Figure 1-1. RF Survey Setup and Important ODU Spectral Sectors

A sector is the ODU beam-width angle in degrees.

AirMux-200 is available with the following ODU Antenna options:

Table 1-1. AirMux-200 Antenna Options

	Type	Gain [dBi]	Range [km]	Range [miles]	Beamwidth [in degrees]
F58					
	Integrated Flat panel	22	41	25.2	9
	External Flat panel	28	80	50	4.5
F52					
	Integrated Flat panel	22	15	9.3	9
	External Flat panel	28	44	27.3	4.5
F24					
	Integrated Flat panel	17	8	5	20
	External Flat panel	24	16	10	8

Mapping an Overall Wireless Picture

Use the Spectrum Analyzer (SA) to map an overall picture of the wireless traffic within the AirMux-200 frequency band in the direction of the remote site, (see [Figure 1-1](#)).

➤ **To map the current wireless signals:**

1. Determine the ODU polarization.
There is an arrow on the back of the ODU. If (V) is pointing upwards, you are capturing Vertical polarization signals. If (H) is pointing upwards, you are capturing Horizontal polarization signals.

Note *Start the process with the ODU in Vertical polarization.*

2. Point the ODU in the direction of the remote site.
Use the compass headings found in the preliminary survey to determine the ODU direction.
3. Set the SA to measure the full frequency band (span) of the system operation:
AirMux-200/f58: 5.725 GHz–5.850 GHz
AirMux-200/f52: 5.250 GHz–5.350 GHz
AirMux-200/f24: 2.400 GHz–2.4835 GHz
4. Enable the Max Hold function of the SA.
5. When taking the measurement, move ODU elevation axis up and down slowly at least twice. Do not change the azimuth. The up and down motion captures all signal traffic in the frequency band.

Notes

- *Before taking a measurement, it is important to increase the spectrum analyzer sensitivity to overcome low-level signals.*
 - *Take into account the ODU gain and RF cable loss.*
-

6. Save the screen picture. Write the filename in the RF Survey Form.

7. Check the spectrum picture and fill in the relevant information in the RF Survey Form.
If there are available frequency channels, continue with step 8. If there are no free frequencies in which to install the AirMux, stop the procedure and select one of the alternative installation options below. When you decide on a suitable alternative, repeat the Mapping procedure from step 1.
 - Change the ODU polarization. Rotate the ODU so that the arrow marked “H” on the rear of the ODU points upwards.
 - Change the ODU height. Move the ODU higher or lower.
 - Go to an alternative site.
8. Cancel the Max Hold function to refresh the screen.

Testing Channel Purity

This procedure checks the purity of each frequency channel. A pure channel is a narrow frequency band with no RF traffic.

Observe the following:

- Use the best polarization found in the previous procedure.
- To examine the spectral purity of each channel, reduce the SA span to:
 - 10/15 MHz for AirMux-200/f58
 - 10/15 MHz for AirMux-200/f52
 - 10/15 MHz for AirMux-200/f24.

Record your findings in the RF Survey Form. (See [Appendix C](#))

➤ **To identify a pure channel:**

1. Write the ODU polarization in the RF Survey Form.
2. Point the ODU in the direction of the remote site. Use the compass headings from the preliminary survey to determine the ODU direction.
3. Set the SA to the center frequency for the channel under test (see RF Survey Form for your AirMux-200 for the center frequencies).
4. Enable the Max Hold function of the SA.

5. When taking the measurement, move the ODU elevation axis up and down slowly at least twice. Do not change the azimuth. The up and down motion captures all signals in the frequency channel.
6. Save the screen picture.
Write the filename on the RF Survey Form.
7. Write the ODU direction in the RF Survey Form (refer to directions (1)–(4) in *Figure 1-1*).
8. Measure the peak signal level with the marker of the SA.
Write the peak signal level in the RF Survey Form.

Note

Compensate for cable loss and ODU gain.

9. Write any other remarks in the RF Survey Form.
10. Cancel the Max Hold function to refresh the screen.
11. Repeat for all channels in the RF Survey Form.

➤ **To verify a pure channel**

1. Select one pure channel frequency from the RF Survey Form, repeat steps 3 to 10 in the following directions:
(See *Figure 1-1*)
 - Opposite direction (2)
 - Adjacent sector (3)
 - Adjacent sector (4).
2. If all directions are interference free, configure the frequency link at the pure channel.

Chapter 2

Antenna Alignment

2.1 Introduction

To achieve the best benefit and link budget from the AirMux installation, the link ODU's must be aligned; the two ODU's should exactly face each other.

In order to achieve the best performance, the line of sight must be as clear as possible with no obstructions between the two sites.

Prior to attempting AirMux ODU alignment, install the hardware and software in accordance with the AirMux-200 Installation and Operation Manual. *Figure 2-1* shows the link setup. At least two people are needed to perform the ODU alignment procedures.

Once the ODU alignment is complete, you are able to evaluate the quality of the link.

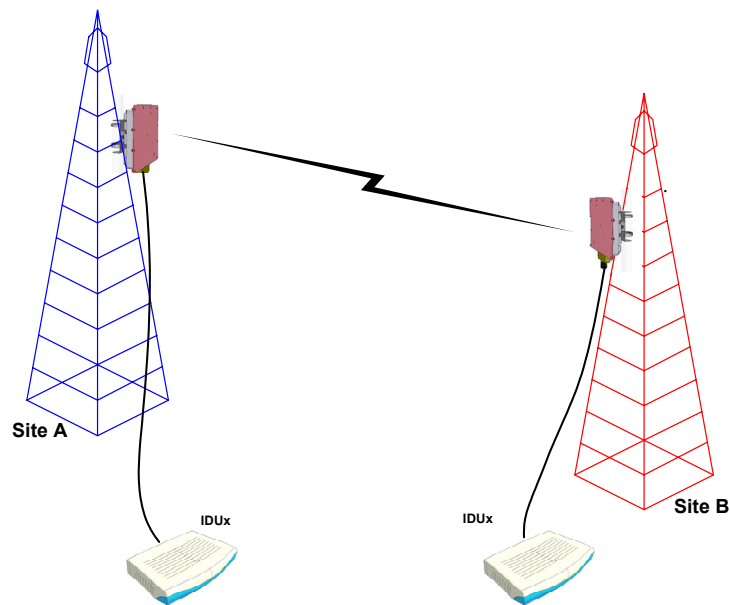


Figure 2-1. AirMux-200 Link Setup

2.2 Expected Signal Level

Based on the link budget parameters of the actual AirMux sites, you need to calculate the expected signal level that will be received by the receiving site.

Use the Link Budget Calculator utility supplied on the AirMux Manager Software CD-ROM to calculate the expected performance of the AirMux wireless link. The utility allows you to determine the RSS of the link, and find the number of E1/T1 services available at various data rates, with the minimum and maximum distance.

2.3 Performing AirMux-200 Alignment

The AirMux-200 ODUs are fitted with a beeper that signals when the best alignment is reached.

Alternatively, align the ODUs via the AirMux Manager Software.

Aligning with the ODU beeper

► **To align the ODUs via ODU Beeper:**

1. Verify that power is connected to the IDUs at both sites.



Warning

Do not stand in front of a live radio terminal

2. The ODU buzzer starts beeping 20 seconds after power up, and continues beeping until the ODUs are aligned, and the link is established.
3. Verify that on power up the green PWR LED on the front panel is on, and that the IDU LED is blinking.
4. Coarsely align the site B ODU in the direction of the site A ODU.
5. Make an azimuth sweep of 120 degrees with the site A ODU. So that the strongest signal from site B can be learnt.
6. Slowly turning the site A ODU back towards the position of Site B, listen to the beeps until the best signal is reached. See [Figure 2-2](#) for the beeper signals.







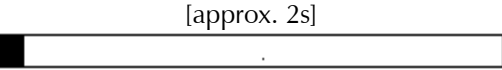
Buzzer Sequence	 =buzzer on  =buzzer off	Description
[approx. 1s] 		Best Signal so far
		Signal quality increased
		No change in signal
		Signal quality decreased
[approx. 2s] 		No air link

Figure 2-2. Buzzer Sequence for ODU Alignment

Note

Three beeps and a pause is the best signal
 Two beeps and a pause, signal quality increased
 One beep and pause is no signal change
 Any other signal detects no signal between ODUs.

7. Secure the site A ODU to the mast/wall.
8. At site B, adjust the ODU slowly whilst listening to the beeper sequence until the best signal is attained.
9. Secure the site B ODU to the mast/wall.
10. Monitor the link quality for about 15 minutes to verify stability.

Aligning with the AirMux Manager

➤ **To align the ODUs using the AirMux Manager:**

1. Verify that the AirMux Manager software has been installed. See the AirMux-200 Installation and Operation Manual for instructions on how to install the software.
2. Verify that power is connected to the IDUs at both sites.



Warning

Do not stand in front of a live ODU.

3. Turn site A ODU in the direction of Site B ODU.
4. At site B, align the ODU to face site A ODU. (Align visually or by using a map and a compass).
5. Repeat step 3 for the site A ODU.
6. At the management site, double click on the AirMux Manager icon to open the application.
7. In the Main screen, verify that the Quality bar, in the Radio Interface pane is within the green Ethernet + TDM area.
8. Verify that the RSS shows the expected level that was calculated by the Link Budget Calculator. See [Expected Signal Level](#) section.
9. Observing the RSS value in the Main menu, rotate the local ODU until the best RSS is found (better than -84 dBm).
10. It may be necessary to adjust the remote site ODU in order to improve the RSS value.
11. When the best RSS level is achieved, permanently attach the ODU to the mast.
12. Monitor the parameter for about 15 minutes to verify stability.

2.4 Configuring the Link

1. Run the Installation Wizard in the AirMux Manager Software to set the configuration of the link. Configure the link in accordance with the parameters calculated in the Link Budget Calculator.
2. AirMux-200 has a unique identification number, the SSID. Each side of the link looks for its partner with the same SSID. Therefore both sides of the link must be configured with the same ID.
3. The AirMux-200 link is now ready for operation.

2.5 Evaluating the Link

With the link operating at a pure channel as determined by the RF survey procedure, the recommended performance threshold of an AirMux-200 link is the following:

RSS: -84 dBm minimum

There are cases when there is no line of sight, but still the link is of an acceptable quality.

If the link is not within the acceptable limit, see [Troubleshooting](#).

2.6 Troubleshooting

1. If the link is not within the acceptable limit as defined in [Evaluating the Link](#), check the following:
 - Verify that both ODUs have the same polarization (horizontal/vertical).
 - Check all the ODU cable connectors for faulty connections.
 - Verify that there are no obstacles in the Fresnel zone of the ODU path such as large buildings, trees, etc.
 - Verify that the spectrum analyzer in use has suitable sensitivity to measure the signal at the distance between the sites.
2. If nothing improves the receive power level, check the overall link.
 - Reduce the distance of the link—move the equipment from one site closer to the other site—where it is possible to actually see the ODUs with the naked eye.
 - If you now get the expected receive signal level, you can assume that the equipment is operational, and the problem arises from interference between the sites.

Appendix A

Fresnel Zone

A.1 Overview

The *Fresnel zone* (pronounced “frA-nel”, with a silent “s”) is an elliptically shaped conical zone of power that propagates from the transmitting antenna to the receiving antenna. It is always widest in the middle of the path between the two antennas.

Fresnel loss is the path loss occurring from multi-path reflections from reflective surfaces such as water, and intervening obstacles such as buildings or mountain peaks within the Fresnel zone.

Links should be designed to accommodate obstructions and atmospheric conditions, weather conditions, large bodies of water, and other reflectors and absorbers of electromagnetic energy.

The Fresnel zone provides us with a way to calculate the amount of clearance that a wireless wave needs from an obstacle to ensure that the obstacle does not attenuate the signal.

The outer boundary of the first Fresnel zone is defined as the *additional path length* of all paths, which are half wavelength ($1/2 \lambda$) of the frequency transmitted longer than the direct path. If the total path distance is one wavelength (1λ) longer than the direct path, then the outer boundary is said to be two Fresnel zones. There are infinite Fresnel zones located coaxially around the center of the direct wave. Odd number Fresnel zones reinforce the direct wave path, even number Fresnel zones cancel the direct wave path.

The amount of the Fresnel zone clearance is determined by the wavelength of the signal, the path length, and the distance to the obstacle. For reliability, point-to-point links are designed to have at least 60% of the first Fresnel zone clear to avoid significant attenuation.

Figure A-1 shows the concept of the Fresnel zone. The top of the obstruction does not extend far into the Fresnel zone, leaving 60% of the Fresnel zone clear; therefore, the signal is not significantly attenuated.

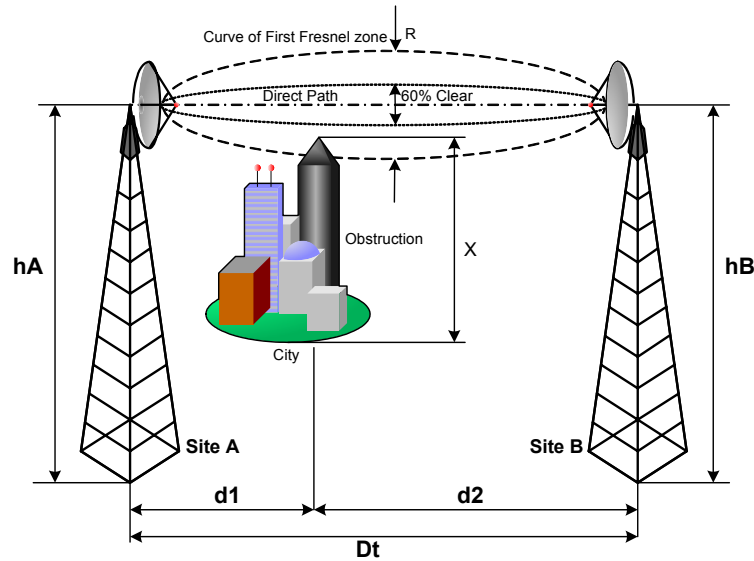


Figure A-1. Fresnel zone

Figure A-1 shows that visually there are no apparent obstructions between site A and site B, but a wireless wave traveling the same path could experience significant attenuation. The clear visual path does not mean that there is an attenuation-free wireless path.

A.2 Calculating the Fresnel Zone

Calculating the Fresnel zone provides us with a way to determine the height of the antenna. The antenna must be of sufficient height to give the clearance that the wireless wave needs from an obstacle to ensure that the obstacle does not attenuate the signal.

Use a GPS device to measure the variables x , $d1$, $d2$ shown in Figure A-1, where:

- x = Height of obstruction
- $d1$ = Distance from transmitting antenna to obstruction
- $d2$ = Distance from receiving antenna to obstruction
- Dt = Total path distance between antennas
- f = Transmitted frequency (GHz)
- R = Curved part of the first Fresnel zone radius (at the obstruction)
- hA = Height of the transmitting antenna relative to sea level
- hB = Height of the receiving antenna relative to sea level

To calculate the diameter of the Fresnel zone in imperial or metric units use the following formula:

$$R = \sqrt{\frac{\lambda(d1)(d2)}{(Dt)}}$$

where:

$$\text{wavelength } \lambda = \frac{c}{f}$$

$$\text{speed of light } c = 3 \times 10^8 \frac{m}{\text{sec}}$$

Determine the height of the antenna so that the obstruction is cleared, as follows:

60% clearance from the first Fresnel zone = R(0.6)

The obstruction height x plus R(0.6) is the minimum antenna height for a successful installation.

Appendix B

Site Evaluation Form

The information you find during the physical site survey will determine if the site is physically suitable for the AirMux wireless network. It is important for you to clearly document all your findings, comments and recommendations.

Copy the evaluation form shown in [Table B-1](#) to record your findings.

Appendix B Site Evaluation Form

Table B-1. Physical Site Survey Evaluation Form

Site Address			
Site Owner			
Site Manager	Phone/e-mail		
Surveyor's Name	Phone/e-mail		
Existing Wireless Equipment		Existing Antenna Locations	
New Equipment Location		Power Source	
Path Length		Fresnel Zone Clearance	
Roof Height		Roof Access Location	
Antenna Location		Antenna Height Above Ground	
Antenna Mounting Hardware Needed		Antenna Heading/Tilt	
Nearby Obstructions		Distant Obstructions	
Cable Type and Length		Cable Entry Point	
Cable Route			
Grounding Locations (Mast and Building Entrance)		Ground Wire Route (Mast and Building Entrance)	
Lightning Protection Description		Lightning Protection Location	
Site Evaluation	Good	Acceptable	Not Acceptable
Comments and Recommendations			
Follow-Up Issues			
Drawings Attached		Photographs Attached	

Appendix C

RF Survey Forms

The information you find during the RF survey will determine if the site is suitable for the AirMux wireless network. It is important to clearly document all your findings, comments, and recommendations.

There is an RF Survey Form for each of the AirMux versions, as each AirMux version has a different operating frequency band. Select the form according to the AirMux system you are installing.

Copy the relevant table from this appendix, or use it as a template, to record your findings:

- AirMux-200/f58 (see [Table C-1](#)) includes 6-fixed 20 MHz channels.
- AirMux-200/f52 (see [Table C-2](#)) includes 5-fixed 20 MHz channels.
- AirMux-200/f24 (see [Table C-3](#)) includes 4-fixed 20 MHz channels.

Table C-1. AirMux-200/f58 RF Survey

AirMux-200/f58					
Date of RF Survey: _____		Performed by: _____			
Antenna Polarization: H <input type="checkbox"/> V <input type="checkbox"/>					
Channel #	Freq. MHz	Antenna Direction	Level of Interference	SA File Name	Remarks
Overall	5730-5840				
1	5740				
2	5760				
3	5780				
4	5800				
5	5820				
6	5840				

Table C-2. AirMux-200/f52 RF Survey

AirMux-200/f52					
Date of RF Survey: _____		Performed by: _____			
Antenna Polarization: H <input type="checkbox"/> V <input type="checkbox"/>					
Channel #	Freq. MHz	Antenna Direction	Level of Interference	SA File Name	Remarks
Overall	5250-5350				
1	5260				
2	5280				
3	5300				
4	5320				
5	5340				

Table C-3. AirMux-200/f24 RF Survey

AirMux-200/f24		Date of RF Survey: _____		Performed by: _____	
		Antenna Polarization: H <input type="checkbox"/> V <input type="checkbox"/>			
	Freq. MHz	Antenna Direction	Level of Interference	SA File Name	Remarks
Overall Band*	2400-24835				
1	2410				
2	2430				
3	2450				
4	2470				



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INTERNATIONAL HEADQUARTERS:

24 Raoul Wallenberg Street, Tel Aviv 69719, Israel, Tel: 972-3-6458181

Fax: 972-3-6498250, 972-3-6474436, Email: market@rad.com

U.S. HEADQUARTERS:

900 Corporate Drive, Mahwah, N.J. 07430, Tel: (201) 529-1100

Toll Free: 1-800-444-7234, Fax: (201) 529-5777, Email: market@radusa.com