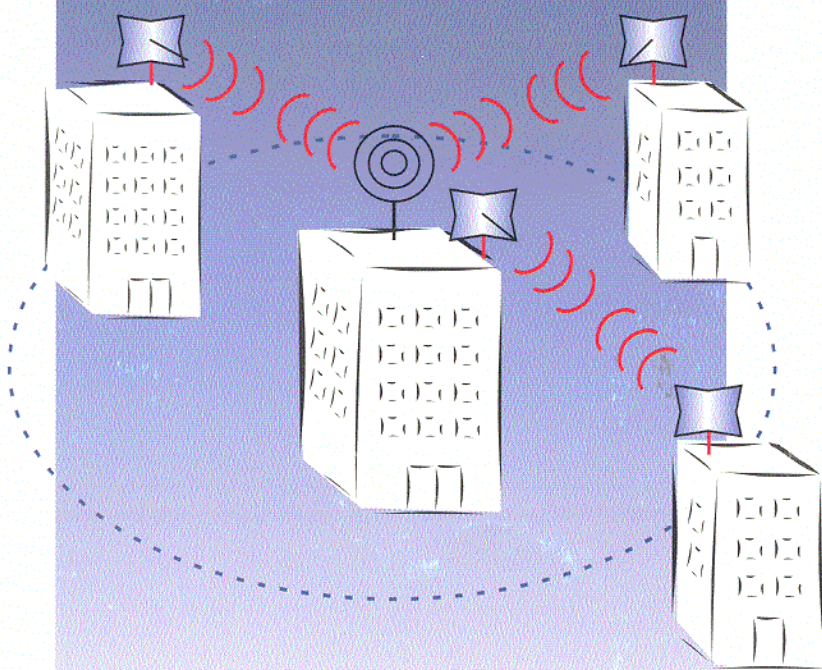


**SPEEDLAN
MANUAL**

High Performance

Communications

Solutions for the Next Millenium



SPEEDCOM WIRELESS INTL CORP.
FCC ID: NCBSLXE
JOB #: 54X0
EXHIBIT #: 7



SPEEDLAN

OPERATOR'S MANUAL

Version 3.2

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It is important for users of Wave Wireless hardware and software to take time to read this License Agreement associated with this software **PRIOR TO ITS USE**. The Customer or Reseller has paid a License fee to Wave Wireless for use of this software on one bridge or bridge/router. This License does not extend to any copyrights to the program nor does it license use of the program on more than one bridge or bridge/router nor to make copies of the program for distribution or resale. A product registration card is included with the product manual. Please complete the card within 10 days of receipt of the software/hardware and return it to Wave Wireless, known hereafter in this License Agreement as Wave Wireless. Registration is required for warranty service, technical support and notification of product updates and revisions.

License Agreement: The Customer or Reseller is granted a non-exclusive License to use the licensed program on a single bridge or bridge/router subject to the terms and conditions as set forth in this agreement. The Customer or Reseller may not copy, modify or transfer the reference manual or other documentation or any copy thereof except as expressly provided in this agreement.

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Return Policies and Warranties

Initial One Year Warranty Term

This Wave Wireless product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period Wave Wireless will, at its option, either repair or replace products that prove to be defective.

If equipment fails the Customer or Reseller shall notify Wave Wireless and request a Return Material Authorization (RMA) number. For warranty service or repair, this product must be returned to Wave Wireless. **All returns to Wave Wireless MUST have a valid RMA number written clearly on the outside of the box or the shipment will be refused.** The buyer shall pay all return shipping charges during the one-year warranty. A spare unit may be cross-shipped during the first 30 days of warranty via ground shipment by Wave Wireless or via air courier with the customer's account number. For an additional 10% of list price the customer may purchase extended warranty / "spare in the air" policy that gives the customer the right to a loaner replacement unit shipped within 24 hours of acceptance of the RMA by Wave Wireless. *All outbound shipments will be made via ground shipment by Wave Wireless or via air courier with the customer's account number.*

Extended Warranty "Spare in the Air" Policies

Essentially, Extended Warranty is a depot maintenance program providing the customer a loaner unit while the warranted unit is being repaired at Wave Wireless facilities.

"Spare in the Air" Loaner Unit or Parts Replacement Policies

This policy gives the customer the right to a loaner replacement unit shipped within 24 hours of acceptance of the RMA by Wave Wireless. All outbound shipments will be made via next day non-priority air or priority air courier with the customer's account number.

"Spare in the Air" Policy Steps for in Warranty or Extended Warranty Loaner Service:

1. Customer obtains RMA approval (requires customer fully completing and returning signed RMA)
2. Overnight shipment of spare unit or parts to customer within 24 hours of approved RMA (*all shipments non-priority air courier customer shipper number supplied*)
3. Customer swaps unit or part(s) with phone assistance, if required.
4. Customer returns part(s) to Wave Wireless. Part(s) returned within 14 days are credited against the invoice. All returns to Wave Wireless MUST have a valid RMA number written clearly on the outside of the box or the shipment will be refused.
5. After 14 days from the issuance of an RMA, an invoice for the list price of the unit or components will be issued for any equipment that has not been returned. This will be credited upon the return of the bad or replacement part or unit to Wave Wireless.
6. Prerequisite is to have "Spare in the Air"/Extended Warranty Policy in place.

Maintenance Pricing Schedule

1st year: 10% of published equipment list price

2nd year: 15% of published equipment list price

3rd year: 15% of published equipment list price

Years 2 & 3 can be purchased if the equipment was under extended warranty during the first year or if a physical on-site equipment inspection is performed and equipment is evaluated in warrantable condition by Wave Wireless personnel at prevailing or site service call rates.

*If all these years are purchased simultaneously, the cost will be 10% per year or 30% of list.

Rental Unit Loaner

Customer may rent a unit at up to \$100 per day plus shipping expenses in lieu of purchasing a spare or "Spare in the Air" loaner service. The rental days are counted from day shipped until the day the unit is returned to Wave Wireless.

Refurbishing Fees

Any product returned that requires refurbishing, is damaged due to inadequate or improper packaging protection or that has not been returned with original packing materials may be subject to a refurbishing fee.

Bench Test and Repair Time

A unit is returned as defective and through bench testing is determined that the unit is not defective, Wave Wireless, at its discretion, may charge

bench test time at an hourly rate of \$85 U.S. per hour for testing and troubleshooting. Out of warranty repairs will be performed at an hourly rate of \$85 U.S. per hour plus parts. All shipping charges will be the responsibility of the customer under the above circumstances.

Onsite Services

Onsite services for troubleshooting and repair are billed at the rate of \$800 U.S. per day plus expenses unless otherwise agreed. If a Spectrum Analyzer or other sophisticated test equipment is required onsite the daily charges for onsite service are \$1000 U.S. per day plus expenses.

Return for Credit

Wave Wireless will accept merchandise returned for credit within 30 days from date of shipment if the customer's wireless link will not operate with the equipment purchased, or if the customer is not satisfied with the product. *All returns to Wave Wireless MUST have a valid RMA number written clearly on the outside of the box or the shipment will be refused.* No returns for credit after 30 days will be approved. Products must be returned undamaged and in original packaging or they will be subject to a refurbishing fee. Return freight charges must be prepaid. At the option of Wave Wireless products may be returned for repair or replaced provided that the goods have not been modified or repair attempted by other than Wave Wireless.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the buyer, buyer supplied interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance. *Systems must be protected from electrical brownouts and surges by a quality UPS such as an "APC Smart" brand or "Tripp Lite Omni" or similar, or warranty shall be null and void.* Warranties do not apply to any product that has been (i) altered, except expressly approved by Wave Wireless in accordance with its instructions, (ii) damaged by improper electrical power or environment, abuse, misuse, accident, or negligence. Repairs in the case of damage from "acts of God" are covered on a time and materials basis. The warranty shall not apply if Wave Wireless prebuilt U.S. FCC approved antenna assemblies have been altered and installed by any persons other than professional wireless installers.

THE FOREGOING WARRANTIES ARE EXCLUSIVE REMEDIES AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No statement, including, without limitation, representations regarding capacity, suitability for use or performance of products, whether made by Wave Wireless employees or otherwise, shall be deemed to be a warranty by Wave Wireless for any purpose or give rise to any liability for Wave Wireless unless expressly contained in writing. Resellers will have complete responsibility and liability for performance of its agreements with its customers and Reseller shall indemnify and hold Wave Wireless harmless from and against all liability arising out of such agreements.

Wave Wireless warrants that the firmware for use with the unit will execute its programming instructions when properly installed on the unit. Wave Wireless does not warrant that the operation of the unit or firmware will be uninterrupted or error-free. Wave Wireless shall not be obligated to remedy any software defect that cannot be repeated.

Exclusive Remedies

The remedies provided herein are the buyer's sole and exclusive remedies. Wave Wireless shall not be liable for any direct, indirect, special, incidental or consequential damages, whether based on contract, tort or any legal theory.

Other Important Statements and Warnings

Trademarks

"Wave Wireless Networking", "SPEEDCOM" are trade names of SPEEDCOM International Corporation. Other trademarks in this document are registered by their respective companies.

FCC Statement (For USA Only) Federal Communications Commission

Radio Frequency Interference Statement for Spread Spectrum Devices

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

Electronic Emission Notices

All Wave Wireless Networking spread spectrum devices comply with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

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

If this equipment causes interference to radio reception (which can be determined by unplugging the power cord from the equipment) try these measures: (1) Re-orient the receiving antenna, (2) Relocate the equipment with respect to the receiver, (3) Plug the equipment and receiver into different branch circuits, or (4) Consult your dealer or an experienced technician for additional suggestions.

DANGER!!!!

Rooftop or tower antenna installations are extremely dangerous and incorrect installation may result in injury, damage, or death. Rooftop and tower installations must be performed by professional antenna installers only.

All personnel should stay at least 1 Meter (3.5') from antenna to avoid exposure to possible microwave energy.

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INTRODUCTION

Features and Benefits

Transparent Ethernet Bridging with Advanced Filtering for Security and Network Reliability

SPEEDLAN supports what is known as Transparent Ethernet Bridging with no Spanning Tree or Source Routing Support. Since the router is intended to provide network security between a local LAN and a campus or enterprise wide network, and since using multiple bridges in a Spanning Tree could compromise this security, the Spanning Tree scenario is not supported. In addition to the Transparent Ethernet Bridging, the SPEEDLAN router can drop (i.e. not forward) packets based upon the encapsulated higher layer data within the packet. It is this option that gives SPEEDLAN routers the ability to perform advanced firewall filtering and can add a significant measure of security and network reliability to a network, surpassing that provided by modern multiprotocol routers.

Optional IP Routing with Advanced Filtering for Security

The router supports IP Routing in addition to bridging. It can be used to add routing capability when an IP router may be a more appropriate choice.

Firewall Filters to Add Security to your Network

In addition to the standard transparent bridging and MAC-layer filtering, the router has capabilities to look deep into packets and decide whether to pass or drop them. This decision is made based on different criteria depending upon the particular protocols used. As an example, IP packets can be dropped (or blocked) that have certain IP destination addresses or are intended for certain IP server sockets, such as the SMTP server, the Telnet server, etc. AppleTalk packets can be dropped based upon the name of the Apple printer or server that is to be used or the name of the AppleTalk zone that the printer or server resides in. You may decide not to turn on these advanced filters in which case the SPEEDLAN will perform as a standard transparent bridge with IP/SNMP capabilities. We recommend, however, that you set up the SPEEDLAN filters to drop any protocols you don't use in order to reduce the network traffic that the local LAN must carry. Without protocol filters, a bridge will pass all Multicast and Broadcast packets into the local LAN. Each computer in the local LAN will experience CPU usage for each of these packets, causing it to slow down.

“Tunneling” - Remote Virtual Bridging of any Ethernet Protocol Using an IP Network as the Transport Mechanism

The router can be configured to provide a virtual Ethernet connection between several LANs using an IP network as the transport medium.

Data Encryption

The SPEEDLAN routers can be configured to provide an encrypted connection between several LANs. These LANs do not have to be using the IP protocol. This feature is particularly useful for companies who wish to provide connectivity by using a public network, but want the security of having their data encrypted.

The SPEEDLAN routers can also be configured to provide an encrypted UDP/TCP data connection to one or more IP subnets. This feature is particularly useful for companies who wish to provide encryption to their UDP/TCP connectivity when using the Internet.

Feature Chart

Hardware Supported

10/100BASE-T Ethernet Card
SPEEDLAN Wireless Cards

Bridging Features

Transparent Bridging
Filtering by Ethernet Multicast, Broadcast and Bad Packets
Filtering by Protocol
Filtering by Ethernet Address Pair
Generic Ethernet Tunneling through IP Networks
Learned Table Lockdown
Expanded IP ARP Support
Automatic Broadcast Storm Protection and Notification

SNMP Features

IP "ping" Support
IP SNMP Support (MIB II, Ethernet, Interface, SNMP, and Bridge MIB)
IP SNMP WaveLAN
IP SNMP Trap Support
SNMP Access Lists

Firewall Security Features (Add-on Option)

IP Net/Subnet/Host Filtering
Apple Talk Zone, Server, and Printer Filtering
Novell Network-Number, Server, and Printer Filtering
DecNET Network Number and Object Filtering
Logging of Attempts to Break In through the Firewall
Optional IP Source-Routed Packet Filtering
Optional IP Multicast Packet Filtering
Optional Suspicious IP-Packet Filtering
Sending of ICMP "Destination Unreachable" Messages
Sending of TCP Reset Messages
Firewall Authentication

IP-Router Features (Add-on Option)

IP Static Routing with Direct and Static Routes
ICMP Messages, Default Router, and Subnet Support
SNMP Support for All Router-Related MIB Variables
RIP Support

Encryption Features (Add-on Option)

Data Encryption on Tunneled Packets
Data Encryption on IP Packets

QUICK START

SPEEDLAN Wireless Brouter Quick Start

The SPEEDLAN brouters are high speed, long range wireless LAN bridges that provide connectivity to remote Ethernet networks. The local brouter communicates with a remote brouter on another LAN. This effectively creates an extended wireless network, spanning sites situated up to 25 miles apart. In this way a central Ethernet LAN may be connected with one or more branch office LANs. A single SPEEDLAN brouter with an omnidirectional antenna, may communicate with multiple remote brouters to create multipoint wireless site to site connectivity.

Package Components

The point to point package you purchased contains the following components for each site:

- This Manual
- Product Registration Card
- SPEEDLAN Brouter
- Windows 95 SPEEDLAN Configuration Utility Software
- Antenna (including assembly instructions)
- 60-ft. (18.3-m) or 110-ft. (33-m) Low-Loss Cable
- Lighting Arrestor
- Electrical-Insulation Putty
- Electrical Tape
- Mounting Poles
- Wall Mounts
- Grounding Clamps (grounding wire not included)

SNMP Management

SNMP wireless and wired link management may be administered from any Ethernet network or remotely from the Internet. The SNMP MIB II, Bridge MIB, and Ethernet-Interface MIB come with the Bridges, so you can use SNMP to monitor a number of SPEEDLAN parameters, including RF-signal quality and noise level.

Wireless Multipoint Protocol (Omnidirectional Antennas Only)

Campus Cell PRC features provide multipoint networking, improved performance, and increased reliability. In multipoint networks, one of the units, which must have an omnidirectional antenna, is configured as a base station with responsibility to manage the flow of data within the radio cell. When necessary, packets are repeated or retransmitted by this base station, allowing communications between multiple satellite networks.

Rooftop and Tower Installations Warning

Rooftop and tower antenna installations are extremely dangerous and incorrect installation may result in death, injury, or property damage. Rooftop and tower installations must be performed by professional antenna installers only.

Installation Steps

Step 1

Line of Sight

Before installing the antennas and bridges make sure clear line of sight exists. Line of sight can be defined as each antenna being able to clearly see the other antenna or being able to see the remote locations when viewing from the base location. Be sure to look level with the center of origin of the transmission (the middle of the antenna). Do the same from the remote location. Any disruption of the signal path due to trees, buildings or any other obstructions may cause the link to function improperly; if you see any such obstruction between the two antennas, move one or both antennas elsewhere.

Step 2

Mount the Antenna

1. On a side building mount, as in the diagram at the end of this section, position the bracket so there will be at least three feet (one meter) above the roof line of the building where the pole is attached; this leaves room for the antenna and reduces signal loss from building reflection. Make certain the antenna will be mounted in such a manner as to prevent unauthorized access within 10 ft. (3 m) of the antenna assembly.
2. Allow for as much space between the wall brackets as possible while still maintaining the antenna height necessary. For extended poles, additional wall brackets may be necessary.
3. Assemble the antenna and mount it to the pole using the included U-bolt hardware. On larger dish-type antennas align the grid on the dish to run parallel with the grid on the tip of the antenna horn. Preferably, the grid should be either horizontal or parallel to the ground. Make sure all bolts and screws are fastened tightly.
4. Fasten the pole to the brackets. Position the antenna, point it in the appropriate direction, and tighten the screws.

Step 3

Run the Cabling

The installation kit comes with two lengths of cable with ready made connectors that fit your particular installation.

1. Attach the shorter cable to the antenna, making sure the connectors are screwed on tightly.
2. Attach the lightning arrestor to the end of the shorter cable.
3. Attach the longer cable to the lightning arrestor.
4. Drill the hole needed to get through the wall, in a good workmanlike manner, being very careful not to drill into power conduits or other utilities in the wall.
5. Feed the cable through the wall and run it to the SPEEDLAN unit.
6. Fasten all cabling securely to the pole and walls using clamps and zip ties. Do not run cable over electrical devices such as fluorescent lights, because these devices will interfere with the operation of the router. Be careful, when pulling or fastening the cable, that unnecessary pressure does not break your connectors.
7. Seal all outdoor connections with the black electrical tape and black sealant insulation putty that comes in the installation kit. First wrap the connectors tightly with the tape. Then carefully wrap the connectors evenly with the insulation putty, making certain to leave no cracks that would allow water to penetrate the seal.

Step 4

Ground the Antenna

1. Mount the lightning arrester to a solid surface.
2. Run the grounding wire from the lightning arrester to a proper ground source such as a grounding rod or roof ground wire.
3. Seal the entire lightning arrester with the black waterproof sealant insulation putty that comes in the installation kit. Note: The lightning arrester is **NOT** waterproof. See the diagram on page 2-5.

Step 5

Connect the Wireless Bridge to the Power Supply

1. Make sure the switch on the power supply is set to the proper voltage (110V or 230V AC).
2. Connect the power cord to an external power outlet (110V or 230V AC).
3. Connect the power cord's IEC 320 female outlet to the IEC 320 male power inlet on the back panel of the SPEEDLAN.

Step 6

Connect the Wireless Bridge to any Available Outlet of the Ethernet LAN

1. Connect the RJ-45 connector on a standard Ethernet cable to the RJ-45 port on the back panel of the bridge.
2. Connect the other end of the Ethernet cable to your Ethernet hub or to any available Ethernet outlet.

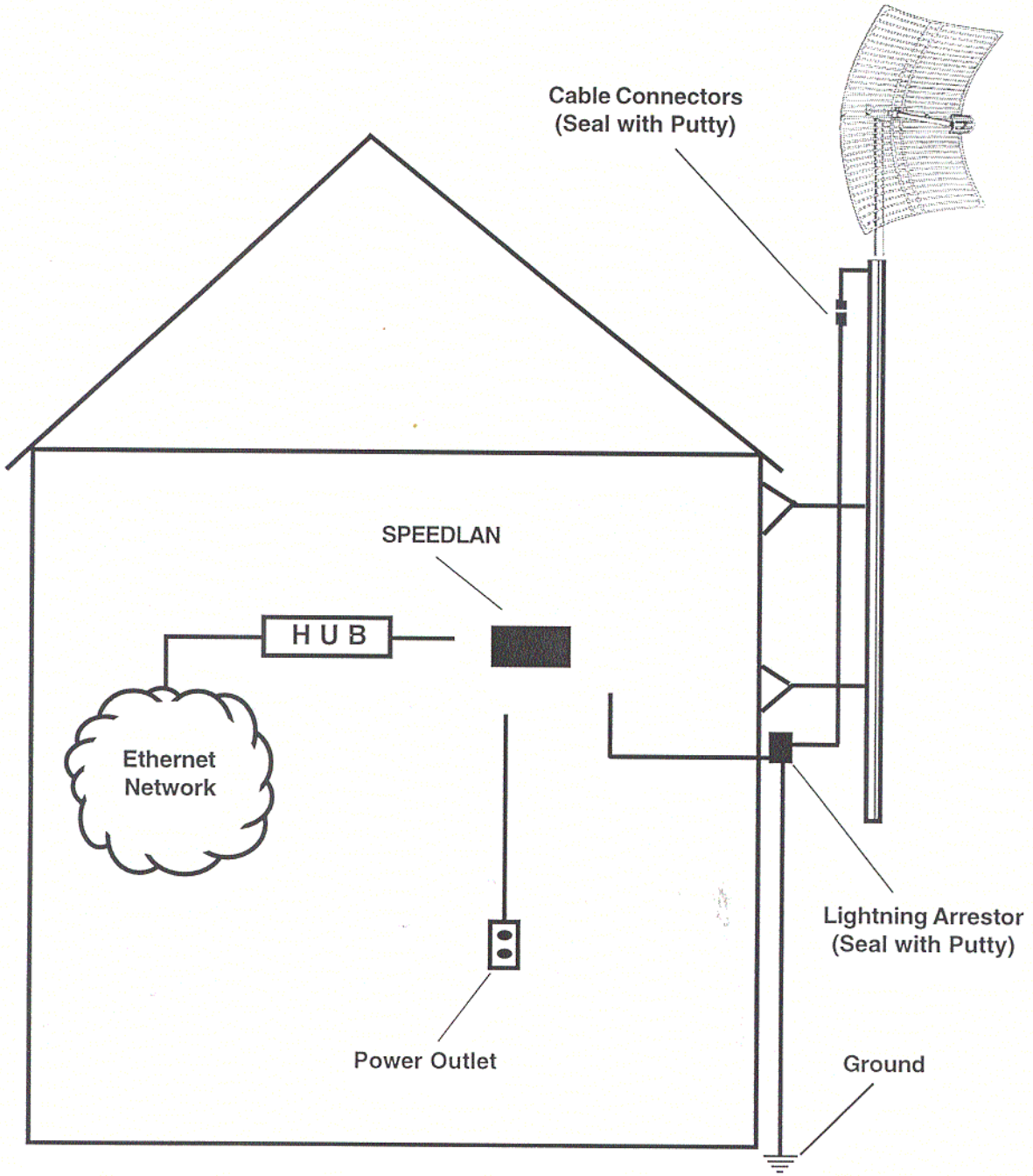
Step 7

Repeat Steps 1-6 for all of the SPEEDLAN units that will be communicating with the first unit.

Step 8

Check Functionality Using the LED Indicators.

After you install the SPEEDLAN units, turn the units on. The radio will automatically transmit a hello packet to the other unit(s) to initiate communication. When a SPEEDLAN remote unit is located, the units will synchronize themselves with each other once communication is established, the units will start forwarding data packets to the wireless LAN connected to each of the SPEEDLAN bridges. When the bridges are handshaking correctly, you will see the receive and transmit lights blink on and off as they communicate. As the bridges forward data back and forth to one another, you may occasionally see a collision light on the display panel, this is a normal aspect of networking. A solid collision light displayed on the front panel indicates that the particular interface is not able to detect a link.

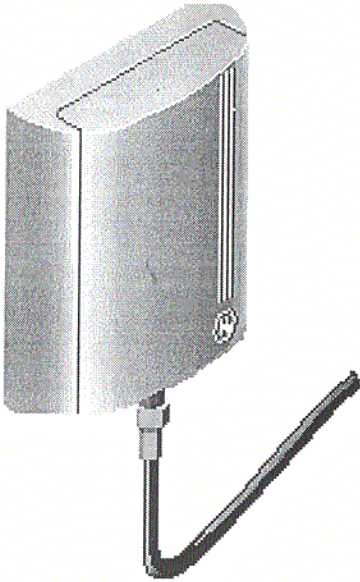


All outdoor cable connections and lightning arrestors must be insulated with waterproof electrical putty

All personnel should stay at least 1 Meter (3.5') from antenna to avoid exposure to possible microwave energy.

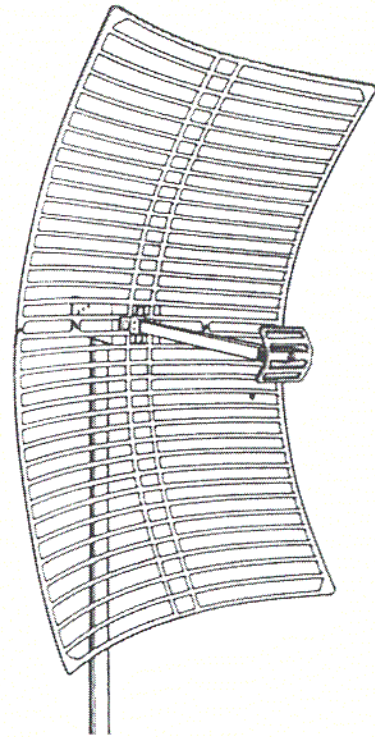
Antenna Alignment and Polarization

The antenna must be aimed so that when you look out from the center of the antenna it is pointing toward the receiving antenna on the other building. The radio signal shoots out the end of the antenna like a wide-beamed flashlight.



Vertical Polarity

Europe



Horizontal Polarity

United States

polarized antennas work best. This is because most signals are vertically polarized. If you use horizontal polarization, you can

For most applications we have found that horizontally polarized antennas work best. This is because most other signals that may cause interference are vertically polarized. Using horizontal polarization can reduce the interference caused by those other signals.

USING CONFIGURATOR

.....

Windows 95/NT 4.0 SPEEDLAN Configurator

Installing the Windows 95/NT 4.0 SPEEDLAN Configurator

Shut down all programs and applications before running Setup on Disk 1 of the floppy diskettes provided with your SPEEDLAN. The SPEEDLAN Configurator uses digital libraries which reside on your Windows 95/NT 4.0 PC. If an application is open and using one of these files, Set up will not be able to complete the installation correctly. If the Configurator is not correctly installed, the brouter could be rendered inoperable after saving a configuration.

1. Close all applications and programs.
2. Insert Disk 1 into the A: Drive (3.5 inch floppy).
3. From the Windows Start Menu select "Run..."
4. Enter "a:\setup.exe" into the space provided and hit Enter or click OK.
5. Please follow the on-screen instructions to complete installation.

File Menu

The Windows 95/NT 4.0 Configurator will configure either a remote Flash ROM in the SPEEDLAN unit or configure a SPEEDLAN file saved on your computer. You can configure a SPEEDLAN file on your computer and download it to the brouter later after you have verified that all settings are correct. This can make reconfiguring your SPEEDLAN brouter a quick operation if you have the completed configuration already saved to your computer.

Configuring a Remote SPEEDLAN Brouter

To configure a remote (network attached) brouter, you can use the Open Remote Config and Save functions. You must have a remote SPEEDLAN configuration opened with the Configuration Utility before any configuration functions may be performed. After you have opened the remote device and configured it, you can then save your configuration back to the open device. When you 'Save' back to the remote device, its Flash ROM will be erased and then reprogrammed with the new configuration. After you save the configuration, you must wait the required 15-second period to allow the Flash ROM to be fully programmed and let the bridge reboot with the new configuration. **Turning off the SPEEDLAN or otherwise interrupting the reprogramming of the Flash ROM will damage the programming of the brouter, and render it inoperable.**

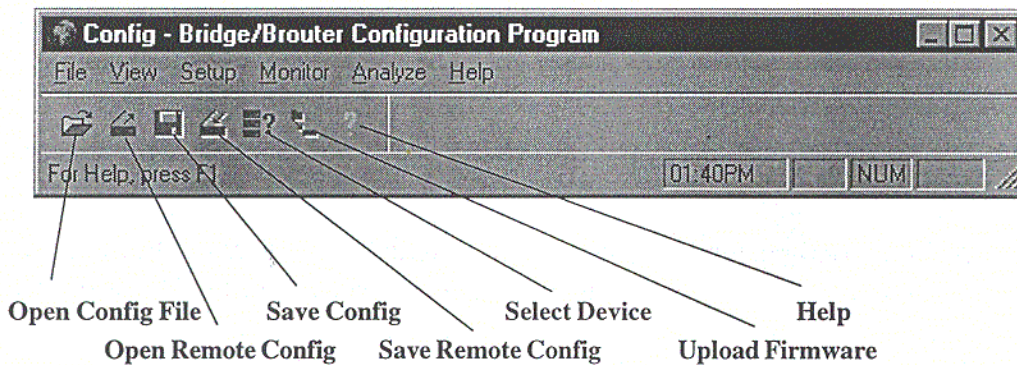
Configuring a Saved Configuration File

To configure a saved CNF file (configuration file), open it from the file menu using the open function. You then configure the file just as if you were configuring a remote SPEEDLAN brouter. When you are finished configuring the file, save it to disk from the file menu using the "Save Config File as..." function. The "Open Remote Config..." and "Save Config" functions are used for accessing and saving directly to the brouter without using a file saved on diskette. Be careful when you save the configuration file that you do not save the configuration directly to the SPEEDLAN; otherwise, you will be configuring the brouter and may not be able to re-access it after uploading the incorrect configuration to it.

Exporting and Importing a Configuration

Once you have opened a remote SPEEDLAN router, you can take a “snapshot” of the current configuration with the “Save Config as...” function. This function will result in creating a CNF file. The extension .CNF is used to denote the special exported binary configuration file. The CNF file created with the “Save as...” function can later be imported into another SPEEDLAN router by using the “Import Config File” function, then saving the configuration to the router using the “Save Config” function.

The Toolbar



Below the menus you see a row of seven icons. Each icon depicts a function that can also be accessed from the menus.

The File Menu

Open Config File - This function is used to open a configuration file from disk.

Open Remote Config - This opens the configuration file directly from a remote device.

Save Config - Saves the configuration you are working on to the place where you opened it.

Save Config as - Saves the current configuration into a file on disk. This file will have the extension .CNF.

Import Config File - This opens a configuration file from disk. This function is used when you are going to save the configuration from disk to a remote SPEEDLAN router.

Upload Firmware - This function is to load a raw and unconfigured binary file to the router. This is done only in the event that the router's firmware has been damaged.

Reboot Remote - Use this function to reboot a router from a remote location.

Exit - Closes the Windows 95/NT 4.0 SPEEDLAN Configurator.

CONFIGURING SPEEDLAN PLUS

Setup Menu

The third menu from the left is the Setup Menu. In this menu are the screens you will use to configure your SPEEDLAN Plus routers. Below are descriptions of the menu items and the settings found on their respective screens.

General Setup

Enable Bridging - The transparent bridging function will be enabled when this item is checked. If you want the router to perform the bridging function, you must enable this. When bridging is enabled, the Bridge Setup Screen will be accessible. Bridging should be enabled for nearly all applications of the SPEEDLAN router.

Enable IP Routing - If you have purchased the IP Routing option, you can enable it by checking this box. IP Routing will work properly only if the routes are set up in the IP Route Menu. **If the routes are not set up properly before you save the configuration, the bridge will become inoperable.**

Enable Data Encryption - The Data Encryption option can be used to either encrypt/decrypt "tunneled" data packets that flow between SPEEDLAN "tunnel partners" or to encrypt/decrypt UDP/TCP packets that flow between routers. Since only the UDP/TCP data portion of the packet is encrypted, the packet will be routed correctly by standard IP routers.

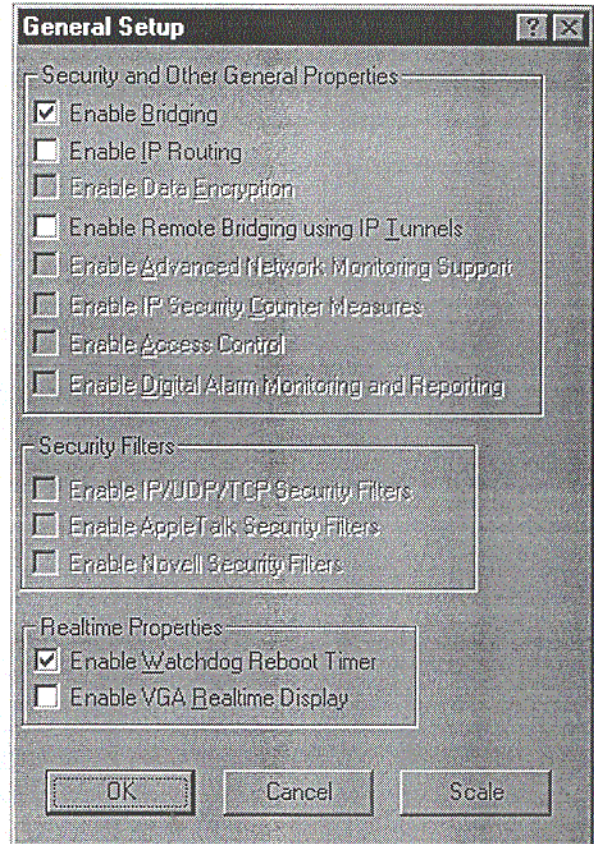
Enable Remote Bridging using IP Tunnels - SPEEDLAN supports a special feature which will enable Ethernet packets of any protocol type to be encapsulated in IP packets and then sent to other SPEEDLAN routers for de-encapsulation. This method can be used to setup *virtual* Ethernet LANs between several points using an IP network as the transport layer.

Enable Advanced Network Monitoring Support - This option is not available at this time.

Enable IP Security Counter Measures - This option is not available at this time.

Enable Access Control - This option is not available at this time.

Enable Digital Alarm Monitoring and Reporting - This option is not available at this time.



Enable IP/UDP/TCP Security Filters - This option is not available at this time.

Enable AppleTalk Security Filters - This option is not available at this time.

Enable Novell Security Filters - This option is not available at this time.

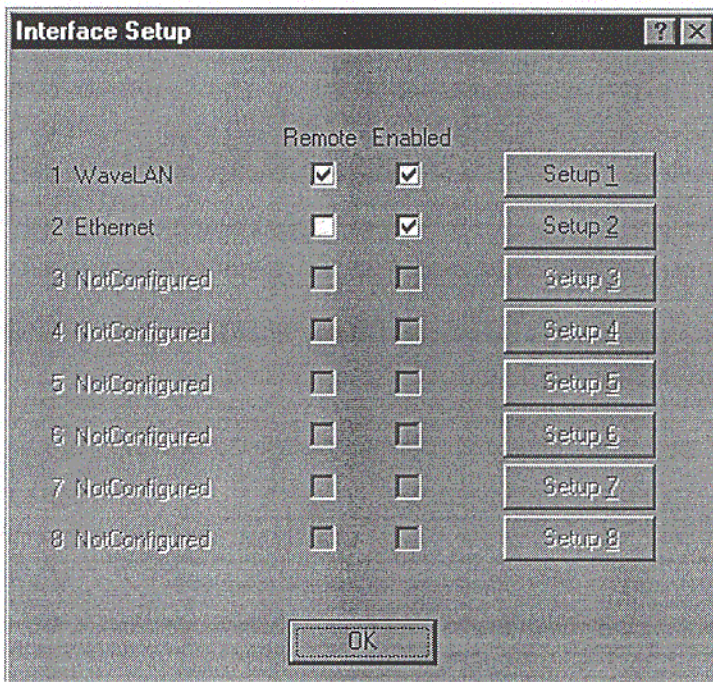
Enable Watchdog Reboot Timer - This feature instructs the bridge to reboot in the event that the bridge fails to receive any incoming packets, from any port, for a period of 10 minutes. The router will assume an error has occurred and will reboot. If, after the router reboots, it does not receive an incoming hello signal, the bridge will listen for the hello signal until the user reboots the router manually. The Watchdog will recognize when a signal has been re-established and will reset the timer accordingly.

Interface & Advanced Interface Setup

The interfaces that are installed in your SPEEDLAN router will be represented on this screen. The Remote check box is used to designate which interfaces will be considered local and remote. The local interface is considered to be the interface that connects directly to the local LAN with respect to the unit. The remote interface is considered to be the interface that connects with the remote LAN. The set up buttons are used to access the portion of the configuration which controls how the individual interfaces are configured.

The Advanced Interface Setup has a few more advanced settings, but essentially they are the same set up screen. One of the settings which differs is the Max Tx rate. Max Tx Rate is useful to ISPs that want to regulate the maximum bandwidth provided to each customer.

These settings should not be changed without the assistance of a Wave Wireless Networking Technical Support Engineer.



WaveLAN Network ID (NWID) - The Network ID assigns a number used to identify the transmissions of an interface. In order for another wireless interface to receive the transmission, the interface must be a matching Wave Wireless Networking product that has the same Network ID assigned to it, otherwise the transmissions will be discarded. This adds to the inherent security of Spread Spectrum technology by encoding the transmissions in such a manner that wireless traffic cannot be intercepted without matching Wave Wireless Networking equipment and the exact Network ID that you assigned to the SPEEDLAN interface.

WaveLAN DES Encryption Key - This option will only be available on SPEEDLAN equipment purchased with the DES Data Encryption package. The Data Encryption package allows further security of the transmitted data. The DES Encryption Key must be the same on all routers expected to transmit data to or receive data from this interface.

WaveLAN Receive Threshold - The WaveLAN Receive Threshold functions in a similar manner as the Squelch Knob on many 2 way radio systems. Increasing the value of the threshold reduces the sensitivity of the receiver. Increasing the value of the threshold would be used to filter out lower level signals that may be interfering with the performance of the receiver. This setting should be changed in small increments until the desired threshold is achieved, setting this value too high can result in the receiver not being able to detect the transmissions of its partners slowing the performance of the unit, or rendering the router inoperable.

Enable External Antenna Support - This setting is required for all installations that require the use of an external antenna. Disabling this setting may damage the router.

Enable Continous Signal Quality Tests - If continous signal quality tests are enabled the router will send special test packets at the rate of one per second. This is helpful because with these tests enabled any receiving station will keep statistics on its ability to receive from this station. The cost for this feature is that the test packets will use a small amount of RF air time. If you have a few wireless stations this is inconsequential. If you have dozens of wireless stations in your wireless cell and all of these stations are transmitting test packets the routers will be severely hindered.

Transport Methods

The industry compatible method of transmitting and receiving data over wireless networks cause data packets to frequently be lost. This is due to the fact that a wireless network does not have the ability to detect collisions like a wired Ethernet network. On an Ethernet network collisions can be detected by the hardware and are automatically retransmitted. Ethernet is referred to as CSMA/CD (Carrier Sense Multiple Access with Collision Detect). Wireless networks are CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance). The reason collisions can not be detected is wireless cannot receive and transmit at the same time, hence SPEEDLAN is not able to listen for the collisions. In practice a properly operating SPEEDLAN point-to-point network will loose, due to collisions, less than 1% of the transmitted packets. This packet loss is not normally a problem with protocols such as Novell IPX (without the Burst Mode NLM) but may cause networks using most other protocols to experience poor performance. Campus Cell PRC helps to alleviate this problem by placing multiple packets into one larger packet, thus saving bandwidth by eliminating the extra overhead.