Boca's Family of Ethernet Products

BOCAHUB-16 *Plus*™

PRODUCT CODE:
BEN220

Boca's Family of Ethernet Products

BOCAHUB-16 *Plus*

Boca's Family of Ethernet Products

Hubs:	**Model No.**
BOCAHUB-24 Plus	BEN240
24-port 10BASE-T hub with BNC, AUI, and option port	
BOCAHUB-16 *Plus*	BEN220
16-port 10BASE-T hub with BNC and AUI connections	
BOCAHUB-8	BEN210
8-port 10BASE-T hub	

Plug and Play Adapters:	
BOCALANcard 100/10 100Base-TX/10Base-T Ethernet Adapter	BE100/10
BOCALANcard TP Ethernet Adapter	BEN110
with RJ-45, BNC connector	BEN120
BOCALANcard 2000+ TP Ethernet Adapter	BE2000/T
with RJ-45, BNC connector;	BE2000/2
NE2000-compatible	

| **Other Adapters:**	
PCMCIA Ethernet Adapter	BEN1PA
BOCALANcard-VL	
VESA Local Bus Ethernet Adapter	BEN1VL
with RJ-45 connector	
BOCALANcard-PCI	
PCI Local Bus Ethernet Adapter	BEN1PI
with RJ-45 and BNC connectors	

Before You Begin your Installation

The product you have purchased is designed to be easily installed into most IBM PC or compatible systems. Many products have large, easy-to-read legends to allow for the easy configuring of the product. This installation manual contains detailed instructions. Most included software has automatic installation programs to place the software correctly onto your computer. However, as all computers are configured differently, you may be required to perform some basic DOS or Windows tasks. If you are not familiar with basic DOS commands such as DIR, CD, or EDIT, you should check your DOS manual, or seek assistance from you local computer dealer to install the product.

How to get Technical Assistance

The dealer that you purchased this product or your computer from is the first place you should go for technical assistance. The dealer is usually the most qualified source of help, and is most familiar with your system and how this product should be installed. Many dealers have customer service and technical support programs, with varying levels of support offered, depending on your needs and computer knowledge. ***Please contact the dealer first whenever a problem occurs.***
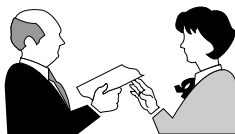
If your Dealer Can't Assist you

If you can't get assistance from your dealer, the manufacturer provides varying levels of technical assistance as summarized on the following page.

Boca BBS
407-241-1601

Technical Support Fax
407-997-0918

Automated *Fax Retrieval System*
407-995-9456

Standard Free Technical Support
407-241-8088

Priority Service
900-555-4900
($2 per minute)

On-Line Support!
CompuServe: **GO BOCA**
Internet:
   email: **support@boca.org**
   on the World Wide WEB:
   http://www.boca.org

The Standard Free Technical Support number is for quick answers to specific inquiries on product features and technical questions (call **407-241-8088**; M-F, 8 am to 6:30 pm EST). Direct access to technical support representatives is provided on a limited basis. If you require immediate attention or in-depth help with the installation of the product, please call our 900-priority support number for service. This number gives you immediate access to senior-level technicians. The number is **900-555-4900**. You will be charged $2.00 per minute. The charges will appear on your next phone bill.

Damaged or Missing Items

We use many world-class quality assurance programs to ensure the product you purchased is of the highest caliber. Sometimes, however, a component may be missing from the box, or is damaged or corrupt in some way. If this happens, immediately return the entire package to your place of purchase so you may exchange it for a new one. Your dealer should be able to provide you with an exchange far more quickly than by contacting us directly. If for some reason you are unable to return the product directly to its place of purchase, refer to the "Servicing Your Product" and "Warranty" sections in this manual for instructions.

Contents

Section One: Introduction

Congratulations on purchasing Boca Research's BOCAHUB-16 *Plus* (product code: BEN220). This low-cost compact Ethernet hub is fully compliant with IEEE 802.3 standards. Its highly integrated dual-chip solution constantly monitors signal quality ensuring increased network reliability. The compact case fits conveniently on the corner of a desk, and multiple concentrators for cascading may be stacked on one another.
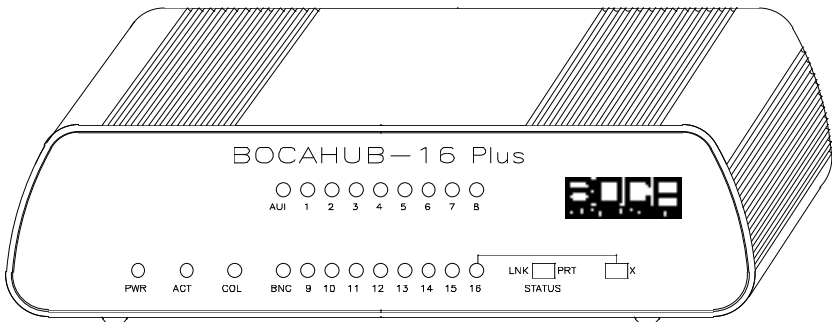
Feature Highlights:

• Low-cost complete network expansion capabilities

• Offers 16 10BASE-T ports, 1 10BASE2 port, and 1 AUI port

- Attachment Unit Interface (AUI) port allows connectivity with 10BASE5 ("thick" Ethernet), 10BASE2 ("thin" Ethernet), as well as 10BASE-FL and/or Fiber Optic Inter-repeater Link (FOIRL) segments (with appropriate adapter)

- Fully compliant with IEEE 802.3 specifications

- Easy installation and setup

- Supports automatic partitioning: the logical disabling of ports that experience an excessive number of collisions. Automatic re-connection occurs when error conditions have been corrected.

- Twisted-pair Link Test capability conforming to the 10BASE-T standard.

- Automatic polarity detection and correction permits automatic recovery due to wiring errors.

Functional Description

The BOCAHUB-16 *Plus* is an implementation of an IEEE 802.3/Ethernet repeater or hub. It provides 16 10BASE-T ports, 1 10BASE2 port, and 1 AUI port in a compact package. The BOCAHUB-16 *Plus* complies with the full set of repeater basic functions as defined in section 9 of ISO 8802.3 (ANSI/IEEE 802.3). These functions are defined below:

Repeater Function

If any single network port senses the start of a valid packet on its receive lines, then the BOCAHUB-16 *Plus* will re-transmit the received data to all other enabled network ports.

Signal Regeneration

When re-transmitting a packet, the BOCAHUB-16 *Plus* ensures that the outgoing packet complies with the 802.3 specification in terms of preamble structure, voltage amplitude, and timing characteristics.

Jabber Lockup Protection

The BOCAHUB-16 *Plus* implements a built-in jabber protection scheme to ensure that the network is not disabled due to the transmission of excessively long data packets.

Collision Handling

The BOCAHUB-16 *Plus* will detect and respond to collision conditions as specified in 802.3. It will also protect the network from an excessive duration of, or frequent collisions by "partitioning" the offending port from the rest of the network. Once a port is partitioned, the data received from that port will not be repeated. However, any other data on the network will be re-transmitted on that port. If the collisions that cause the partitioning cease, the port will be re-connected to the rest of the network.

The status of the partitioning scheme can be checked at any time by moving the LNK/PRT switch on the front of the BOCAHUB-16 *Plus* to the PRT position. If any ports are currently partitioned, the corresponding LED will go out (OFF).

Link Test

The BOCAHUB-16 *Plus* implements the Link test function as specified in the 802.3 10BASE-T standard. It transmits Link test pulses to any port after that port's transmitter has been inactive for a short period of time. The device connected to the port will respond in the same manner.

The Link Status of ports 1-16 can be viewed on the LEDs of the BOCAHUB-16 *Plus* when the LNK/PRT switch is in the LNK position. If a successful link has been established, the corresponding LED will be ON.

Polarity Reversal

The BOCAHUB-16 *Plus* automatically detects and adjusts to reversed polarity of received data.

Front Panel Indicators and Switches
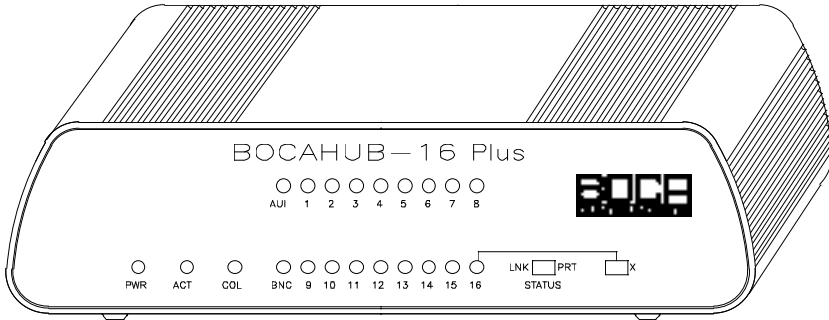
PWR: This LED lights whenever power is applied to the BOCAHUB-16 *Plus*. During normal operation, this light should be ON.

ACT: This LED flashes whenever there is data activity on any of the BOCAHUB-16 *Plus* ports. A steady activity LED indicates a busy network.

COL: This red LED lights whenever two or more ports are receiving data at the same time (i.e., collision). In this situation, the BOCAHUB-16 *Plus* partitions (isolates) the colliding ports. The colliding ports remain partitioned until valid data is received on the colliding ports. At this time, the partitioned port is reconnected.

LINK/PRT SWITCH: LEDs 1-16, AUI, BNC: When set to **LINK**, the LEDs associated with each 10BASE-T port (RJ-45) will light if the port receives a valid link test signal. Note that in this position the AUI and BNC LEDs are off and have no meaning. When set to **PRT** (partition), LEDs 1-16, AUI, and BNC will be on if the port is functioning normally and OFF if the port is partitioned. NOTE: the BNC LED might be off (partitioned) if it is not connected or terminated properly.

X SWITCH: Cross switch. This switch crosses the transmit and receive pairs for 10BASE-T port 16 only. Use this switch when the transmit and receive pairs must be swapped (e.g., cascading concentrators; see pages 26-29 for more information).

Rear Panel Connectors
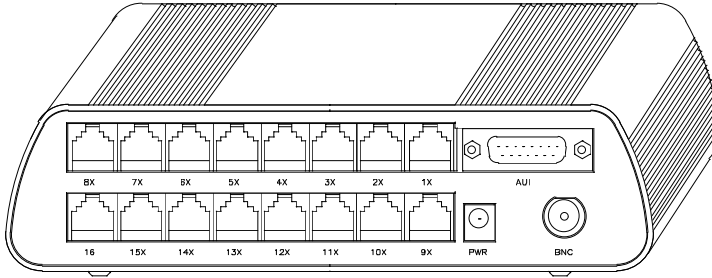
16 10BASE-T PORTS: These are RJ-45 8-pin connectors used to connect to 10BASE-T UTP (unshielded twisted pair) cable. Port 16's transmit and receive pairs are switchable with the X (cross) switch on the front of the unit.

1 AUI PORT: This connector is used to interface with 10BASE5 ("thick" Ethernet coaxial cable), 10BASE2 ("thin" Ethernet coaxial cable), 10BASE-T, or 10BASE-FL or Fiber Optic Inter-repeater Link (FOIRL) segments with an appropriate adapter.
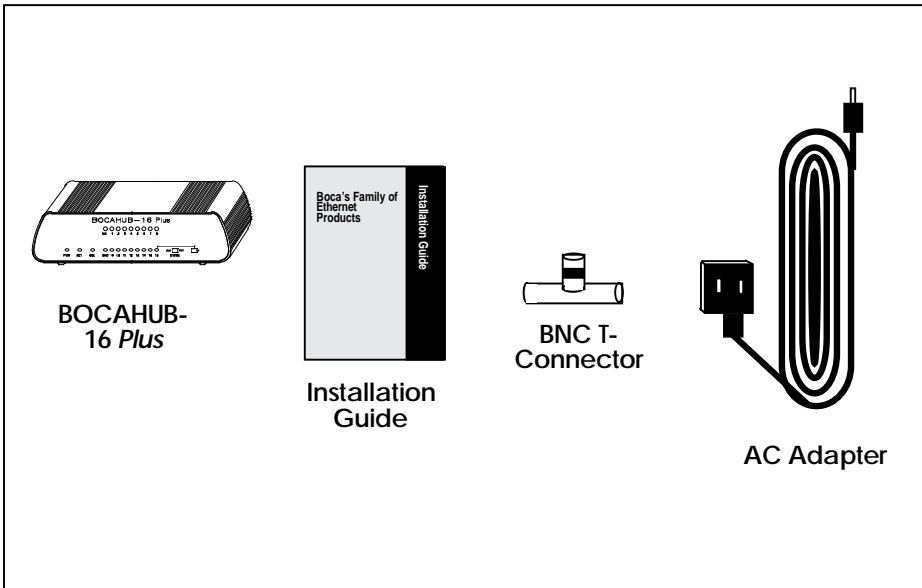
1 BNC PORT: Used to connect to 10BASE2 ("thin" Ethernet).

1 POWER CONNECTOR: Connects to the power transformer provided.

For cable types and maximum lengths, see *Section Three: Network Configuration and Section Four: Cabling Characteristics.*
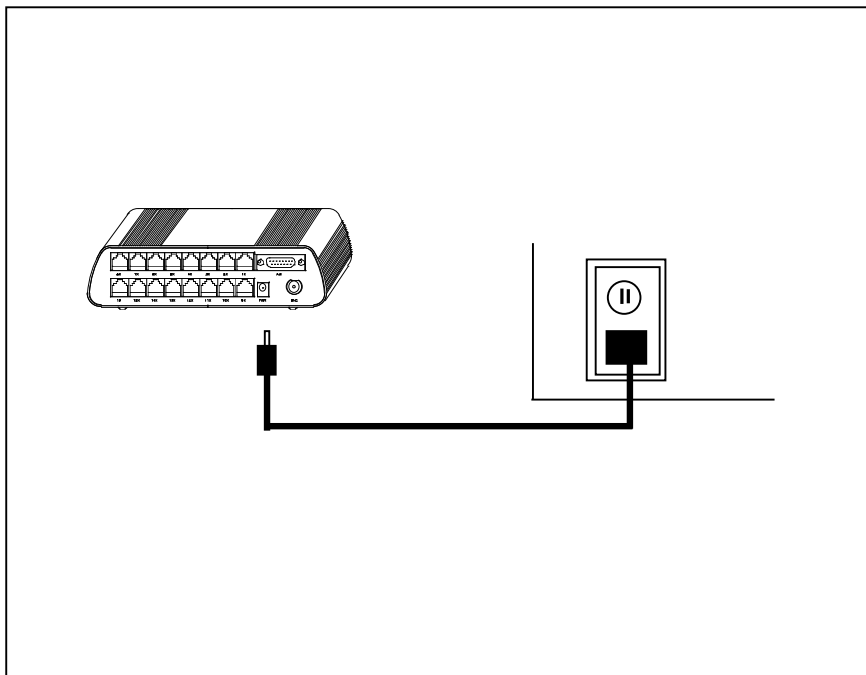
Section Two: Installation

The Contents of Your Package

BOCAHUB-16 *Plus*

Installation Guide

BNC T-Connector

AC Adapter

Connecting the Power Supply

1. Connect the appropriate end of the power cord to the back of the BOCAHUB-16 *Plus* (marked PWR) and insert the remaining end to any conveniently accessible wall outlet.

2. Check the front panel LEDs. If the power (PWR) LED is not ON, turn to Section Five: Troubleshooting.

Section Three: Network Configuration

The BOCAHUB-16 *Plus* is intended to connect multiple workstations (stand-alone) and/or other concentrators to an Ethernet star topology network.

3.1 10BASE-T PORTS

The BOCAHUB-16 *Plus* has 16 10BASE-T UTP (unshielded twisted pair) ports to connect to other hubs or workstations. This connection uses an RJ-45 8-pin connector. When connecting to workstations, a straight-through connector is used. When connecting to other hubs, a "crossed" cable is used. Connections are on the next page. See Section Four: Cabling Characteristics for pin-outs of cables.

NOTE: If a straight cable is used to connect to another hub, the X switch can be used to internally cross the transmit and receive pairs of the cable using port 16.
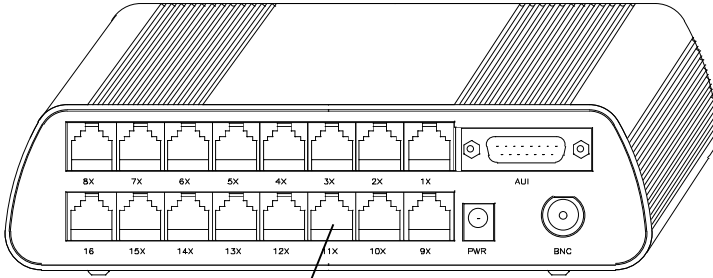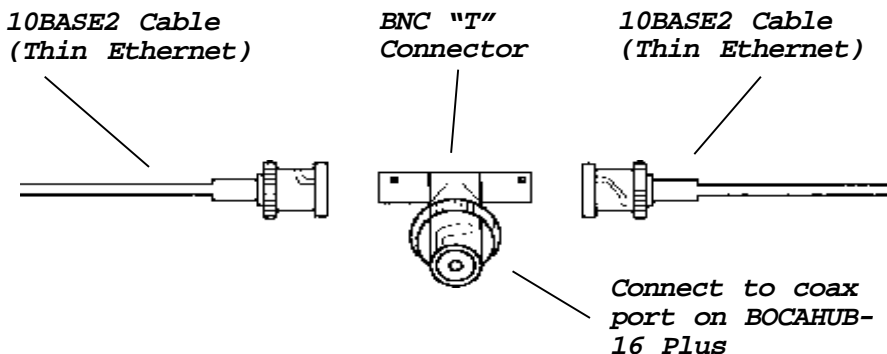
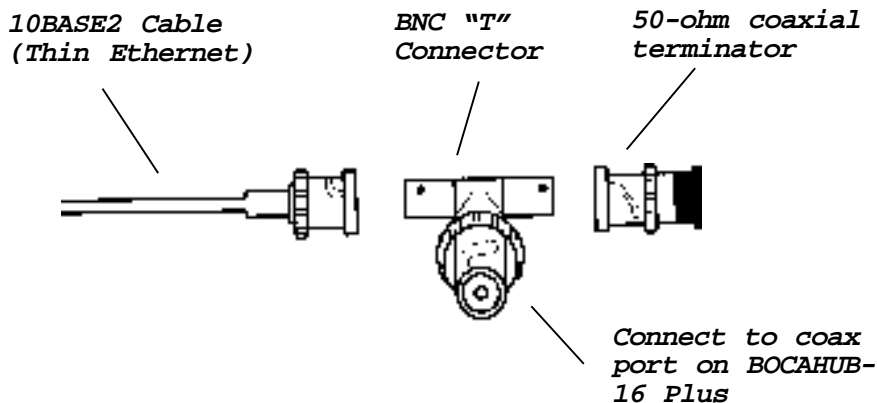*RJ45 (10-pin or 8-pin) (see Section Four for pinouts.*

3.2 10BASE2 PORTS

The BOCAHUB-16 *Plus* has one 10BASE2 (BNC) connector which interfaces directly to a 10BASE2 ("thin" Ethernet) network. The 10BASE2 connection must be to RG58 A/U or C/U 50-ohm coaxial cable. The ends of the cable segment must have 50-ohm terminators installed. Up to 30 connections (taps) can be made to a 10BASE2 segment. The BOCAHUB-16 *Plus* is connected to a 10BASE2 segment with a BNC T-connector, which is illustrated on the next page.

For Installation in the middle of a 10BASE2 Segment

10BASE2 Cable
(Thin Ethernet)

BNC "T"
Connector

10BASE2 Cable
(Thin Ethernet)

Connect to coax
port on BOCAHUB-
16 Plus

For Installation at the end of a 10BASE2 Segment

10BASE2 Cable
(Thin Ethernet)

BNC "T"
Connector

50-ohm coaxial
terminator

Connect to coax
port on BOCAHUB-
16 Plus

3.3 AUI PORT

The BOCAHUB-16 *Plus* has one AUI connector which interfaces with a 10BASE5 ("thick" Ethernet) network. The AUI port is normally used to connect to 10BASE5, but can also be used to interface with other types of networks such as 10BASE2, 10BASE-T, or FOIRL (Fiber Optic Inter-repeater Link). A sample connection is shown on the next page.
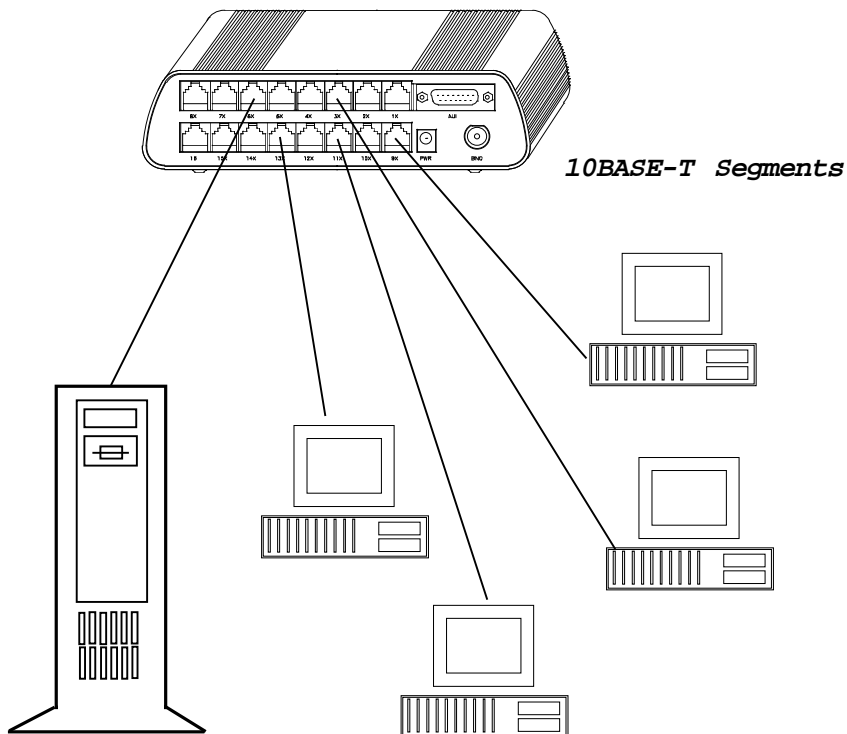
BOCAHUB-16 PLUS

AUI cable

Transceiver

10BASE5 (Thick Ethernet) Backbone
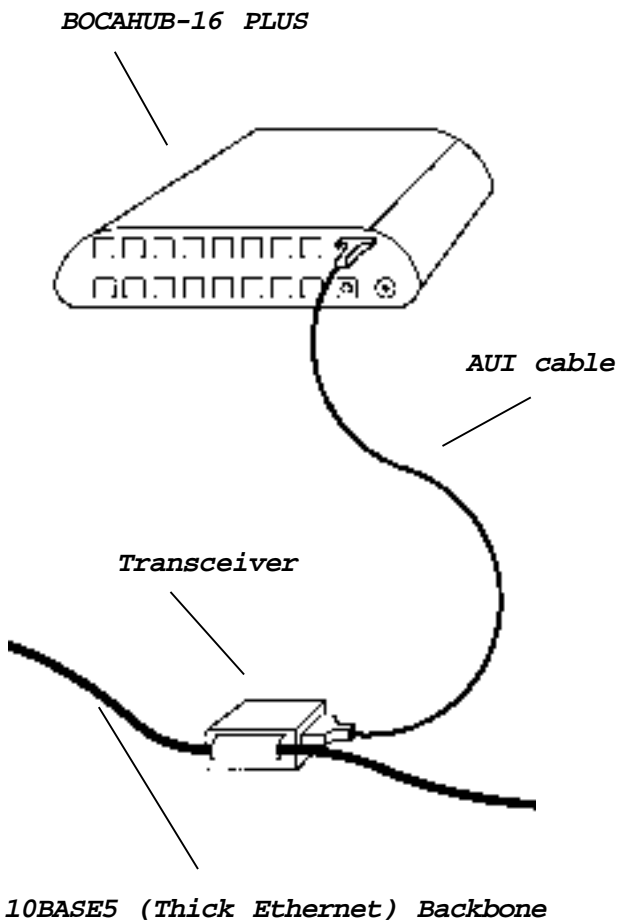
3.4 Network Combinations

Note that the different types of topologies can co-exist in one network using the BOCAHUB-16 *Plus.* Following are some sample network arrangements using multiple topologies.
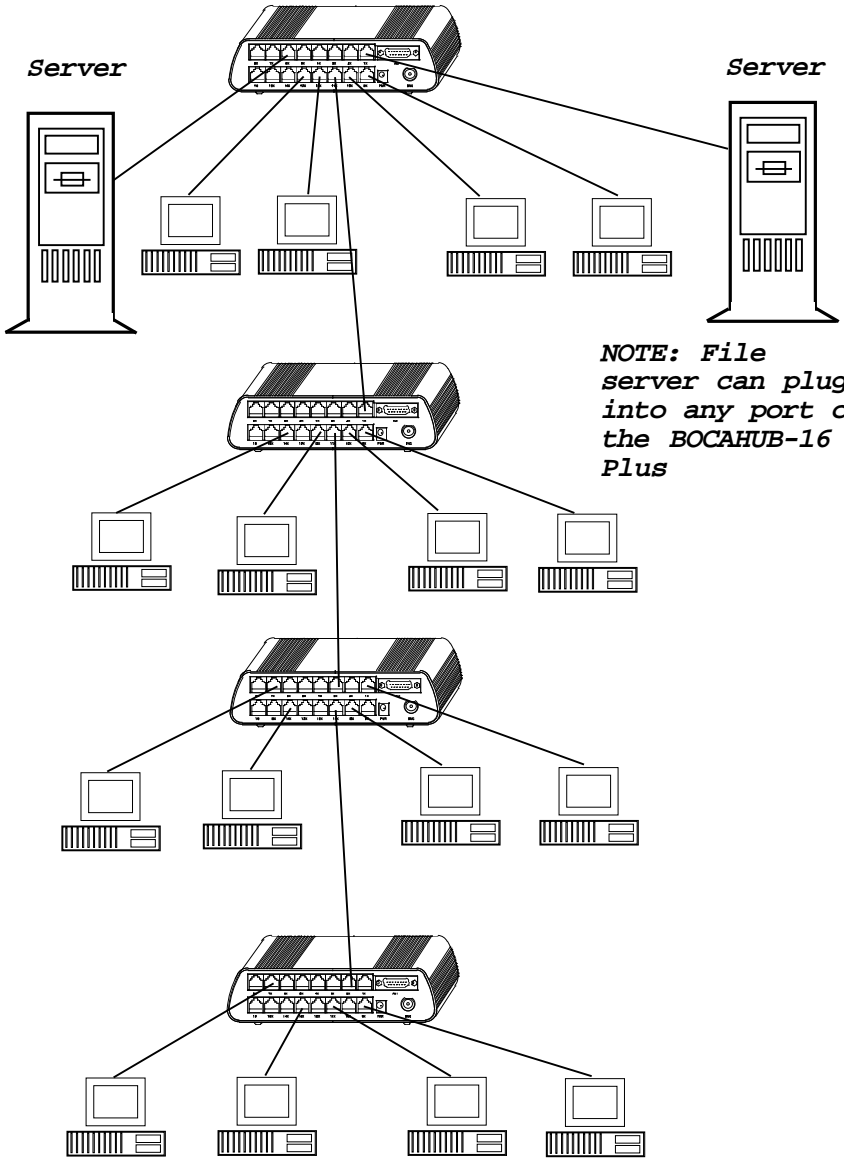
Note: When cascading concentrators, there should be no more than four (4) concentrators between any two (2) workstations.

3.5 SINGLE WORKGROUP CONFIGURATION

10BASE-T Segments

NOTE: File server can plug into any port on the BOCAHUB-16 Plus
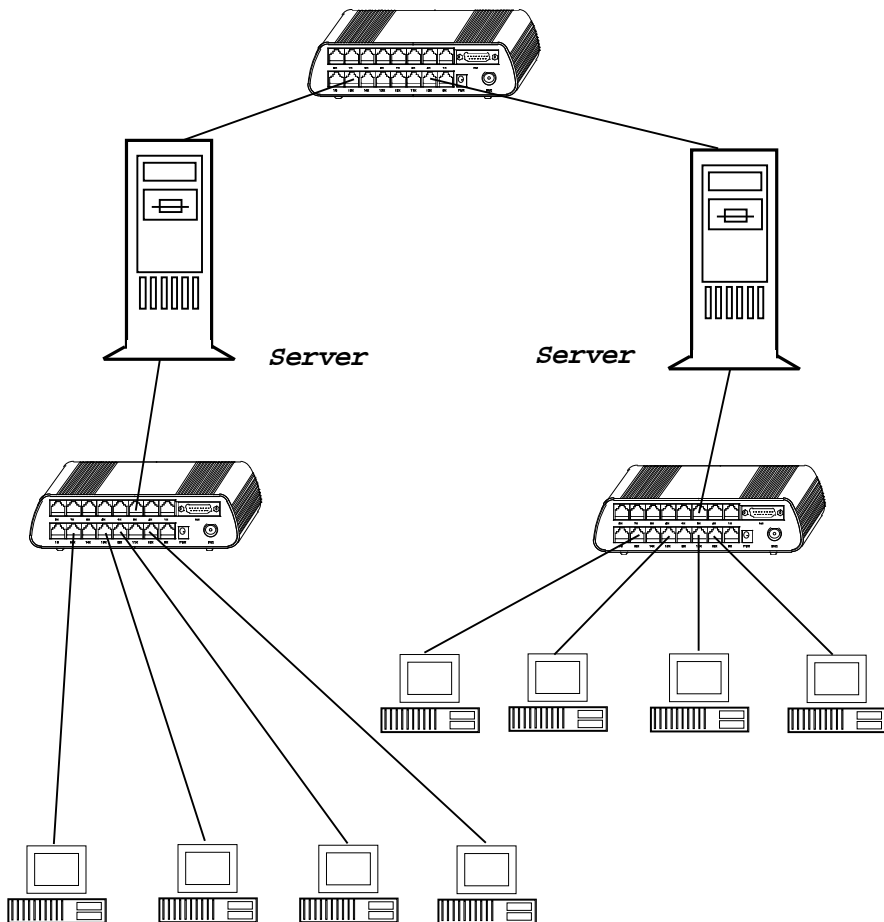
3.6 CASCADED NETWORK CONFIGURATION

Server

Server

NOTE: File server can plug into any port on the BOCAHUB-16 Plus

3.7 CASCADED NETWORK CONFIGURATION USING
**ROUTERS (see your network operating system documentation
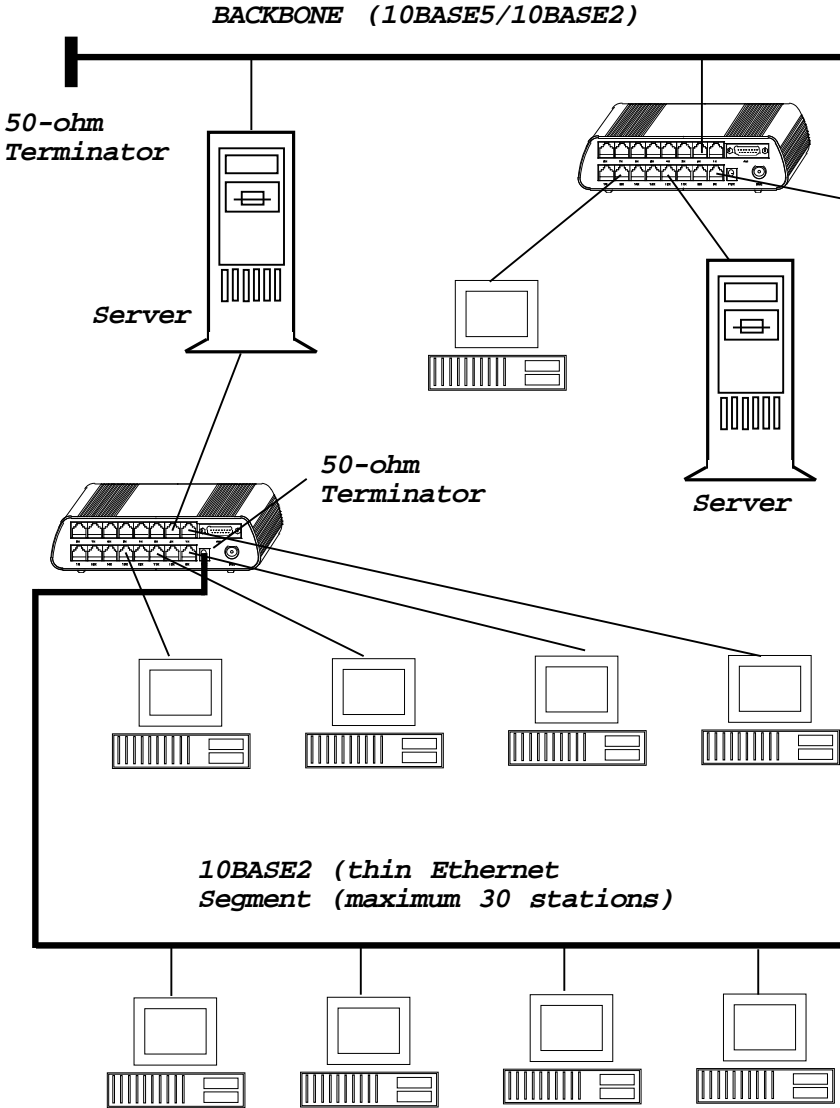for information on routers)**

Server *Server*

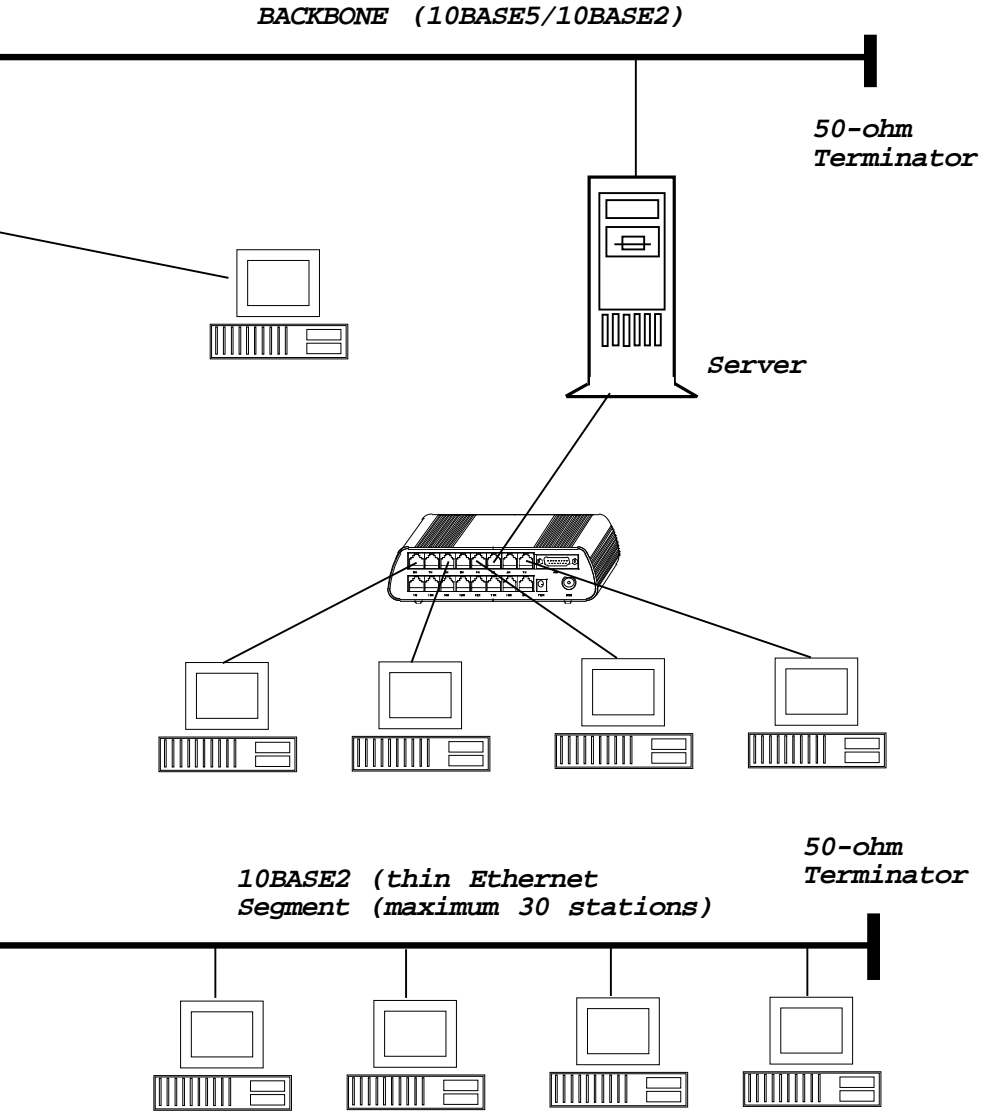## 3.8 EXPANDED CASCADED NETWORK CONFIGURATION USING ROUTERS (see your network operating system documentation for information on routers)

BACKBONE (10BASE5/10BASE2)

50-ohm
Terminator

Server

50-ohm
Terminator

Server

10BASE2 (thin Ethernet
Segment (maximum 30 stations)

BACKBONE (10BASE5/10BASE2)

*50-ohm
Terminator*

Server

*50-ohm
Terminator*

*10BASE2 (thin Ethernet
Segment (maximum 30 stations)*

Section Four: Cabling Characteristics

4.1 Cable Type

Topology	10BASE-T	10BASE2	10BASE5	AUI Cable
Cable:	UTP	Thin Coaxial	Thick Coaxial	STP
Type:	Unshielded Twisted-pair 22-26 AWG (0.4-0.6 mm) 2 pairs	50-ohm coax RG58 A/U or C/U	50-ohm coax RG11 A/U or C/U	Shielded Twisted-pair
Male Connector:	8-pin RJ-45	BNC	coaxial tap connector	DB-15 with slide latch
Maximum Distance:	100m (328') Minimum: .6m (2')	185m (600') Minimum: .5m (1.5')	500m (1640')	50m (164')

4.2 10BASE-T Pin Assignments

An Ethernet twisted pair link segment calls for two pairs of wires, with each pair differentiated by color. Each twisted pair link segment must have an RJ-45 male connector attached to both ends. Pins 1 and 2 on the RJ-45 connector are for transmitting data while pins 3 and 6 are for receiving data. See chart below:

RJ-45	Assignment*		RJ-45	Assignment*	
1	Tx+	**This is standard for Ethernet devices.**	1	Rx+	**This is the signal on the BOCAHUB-16 Plus. Port 16 can have the Tx and Rx crossed.**
2	Tx-		2	Rx-	
3	Rx+		3	Tx+	
6	Rx-		6	Tx-	

* The "+" and "-" signs are used to represent the polarity of the two wires that make up each wire pair.

NOTE: Each wire pair must be connected to the RJ-45 connectors in a specific orientation. Refer to 4.3 Crossover Function for details.

4.3 Crossover Function

Two Ethernet 10BASE-T devices can communicate only if the transmitter on one device is connected to the receiver of the other device. The 10BASE-T specification suggests that the crossover function be implemented in the concentrator itself. On the BOCAHUB-16 *Plus*, this crossover function is implemented in all ports. However, the last port can be switched to straight-through to simplify installation when cascading concentrators. This switch is labelled "X" and located on the front of the BOCAHUB-16 *Plus* below the Boca Research logo.

When a twisted-pair port labelled with an "X" is connected to a device which does not support the crossover function, "straight-through" wiring can be used (see 4.4).

When connecting two identical twisted-pair ports (that is, ports that either BOTH support or NOT support the crossover function), a crossover must be implemented in the wiring (see 4.5).

4.4 Straight-Through Wiring

If the twisted pair link segment is to connect two ports and only one of the ports features an internal
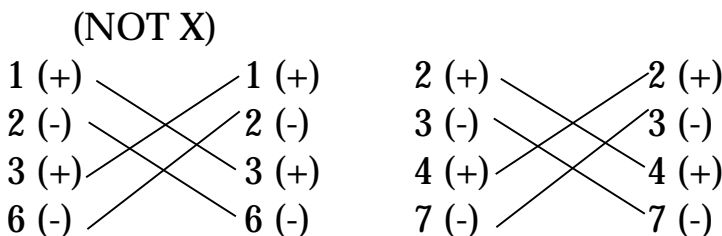
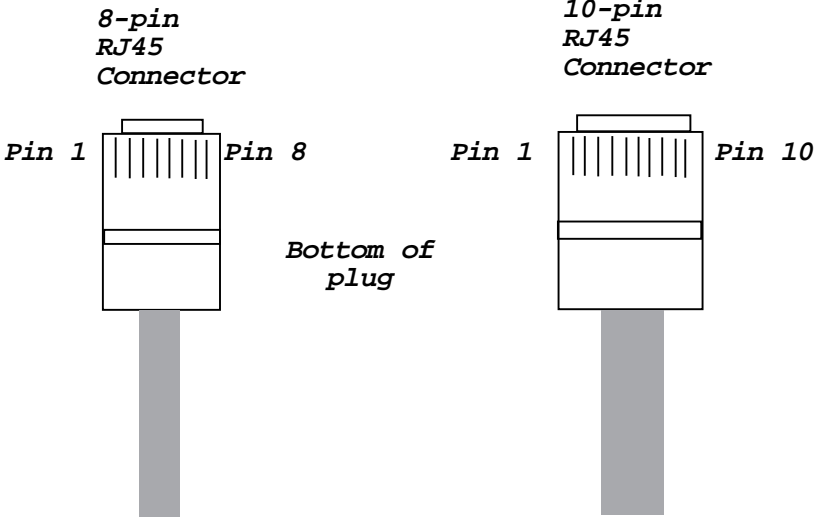crossover, the two pairs of wires must be straight-through:

STRAIGHT-THROUGH RJ-45 PIN ASSIGNMENTS

(8-pin RJ-45)		(10-pin RJ-45)	
Concentrator	Device	Concentrator	Device

X

1 (Rx+) ———	1 (Tx+)	2 (Rx+) ———	2 (Tx+)
2 (Rx-) ———	2 (Tx-)	3 (Rx-) ———	3 (Tx-)
3 (Tx+) ———	3 (Rx+)	4 (Tx+) ———	4 (Rx+)
6 (Tx-) ———	6 (Rx-)	7 (Tx-) ———	7 (Rx-)

4.5 Crossover Wiring

If both ports are labelled "X", or neither port is labelled, then the crossover must be implemented in the wiring

(NOT X)

1 (+)	1 (+)	2 (+)	2 (+)
2 (-)	2 (-)	3 (-)	3 (-)
3 (+)	3 (+)	4 (+)	4 (+)
6 (-)	6 (-)	7 (-)	7 (-)

```
   8-pin                      10-pin
   RJ45                       RJ45
   Connector                  Connector

Pin 1  |||||||| Pin 8    Pin 1  |||||||||| Pin 10

                Bottom of
                  plug
```

NOTE ON SIGNAL POLARITY

If a receive data pair has the "+" and "-" signals
unintentionally reversed, the BOCAHUB-16 *Plus*
automatically detects and adjusts this reversal so the
data path will function properly.

Section Five: Troubleshooting

5.1 Status/Diagnostic LEDs

The BOCAHUB-16 *Plus* features a total of 21 front panel LEDs to aid in testing the installation and the diagnosing of problems. There are 16 LINK/PARTITION LEDs, one Power LED, one Collision LED, one Activity LED, one AUI LED, and one BNC LED.
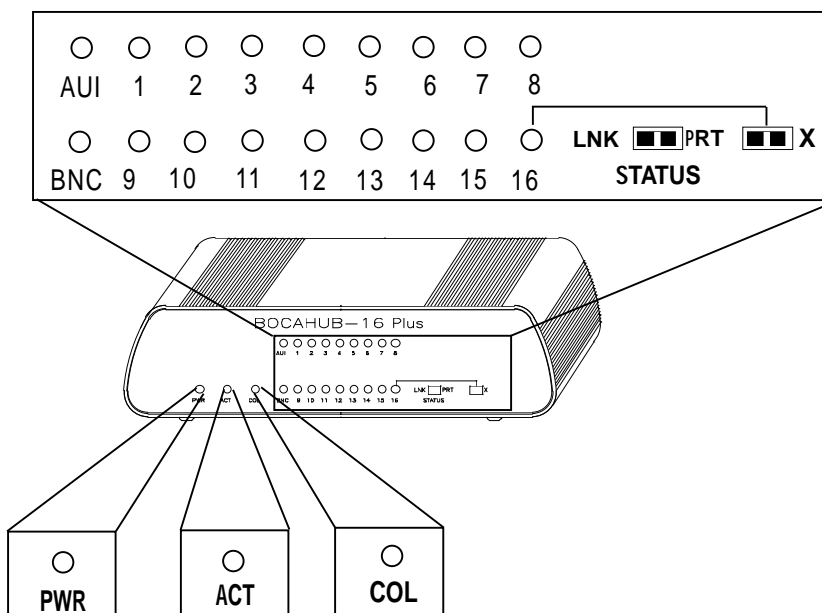
Note that AUI and BNC are not used when the switch is set to Link.

Ports 1 through 16 feature an associated Link/ Partition LED. A switch is used to toggle between the **LINK** and **PARTITION** display status.

When set to **LINK**, the status LED will be **ON** continuously for a given port IF a device is physically attached and functioning normally. If the LED is **OFF** or **FLASHING**, there is a problem with the corresponding device. Note that the AUI and BNC port LED is **OFF** during normal operation; the LED will be **ON** only for PARTITION STATUS; no LINK STATUS is used.

When set to **PARTITION**, the LED will be **ON** continuously for a given port IF the port is not partitioned due to excessive collisions on the port. If the LED is **OFF**, the associated device has been isolated from the network because of excessive collisions (concentrator receiving data from two or more devices at the same time), or jabbering on the port.

Each BOCAHUB-16 *Plus* concentrator also has:

• A GREEN power LED to indicate that the BOCAHUB-16 *Plus* has power.

• One RED collision LED to signal a network collision. If this light stays ON, toggle the LNK/PRT switch to PRT (for PARTITION), to isolate which device is causing the collision.

* One GREEN activity LED to indicate network activity.

LED functionality is summarized on the following page:

LED	COLOR	#	STATUS	MEANING
POWER	GREEN	1	ON	BOCAHUB-16 *Plus* has power.
COLLISION	RED	1	ON	A network collision has been detected. BOCAHUB-16 *Plus* is receiving data from two or more devices at the same time.
ACT	GREEN	1	ON	The BOCAHUB-16 *Plus* is receiving data from one or more ports.
			OFF	The BOCAHUB-16 *Plus* is not receiving data on any of its ports.
PORT LINK STATUS (1-16)	GREEN	8	ON	The port is receiving a valid link test signal with LNK/PRT set to LNK.
BNC AUI	GREEN	2	NA	NOT USED to show link status.
PORT PARTITION STATUS (1-16) BNC AUI	GREEN	8	ON	Associated device is attached and functioning normally.
			OFF	Device has been isolated because of COLLISION or jabbering

5.2 Installation Test

IF THE POWER LED IS NOT ON AND THE BOCAHUB-16 *Plus* SHOWS NO ACTIVITY

• Check the connections between the concentrator, the power cord, and the wall outlet.

• Make sure the wall outlet has power.

• Try another AC power adapter that you know works. If the Power LED still fails to come ON, the BOCAHUB-16 *Plus* may be faulty. Call Technical Support.

IF THE LINK LEDs DO NOT RESPOND

Check the connections between each network device and the concentrator port, including wiring. Make certain all devices have power and are working normally.

Appendix A: Specifications

Operating
Temperature: 20-50 degrees Centigrade

Relative
Humidity: 70% (non-condensing)

Power: 9V AC @ 1.4A

- Twisted-Pair Cable Interface: Twisted Pair using RJ-45 connectors
- Coaxial Cable Interface: RG58 A/U or C/U using BNC connector
- AUI cable Interface: DSUB 15 with latch using shielded twisted pair

Connectors:

- 16 10BASE-T ports using RJ-45 (unshielded twisted pair) (maximum cable length: 328'/100m)

- 1 10BASE2 port with BNC connector (maximum cable length: 600'/185m)

- 1 AUI port with DB-15 connector (maximum cable length: 164'/ 50m between concentrator or adapter and receiver)

LEDs: 21 including 1 power LED (green), 1 collision LED (red), 1 activity LED (green), and 18 dual function link status/ port partitioning LEDs.

2 slide switches for dual function LEDs and crossover port for cascading multiple concentrators.

Dimensions: 5.4" x 7.75" x 2.0"

Appendix B: FCC Compliance

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense."

CHANGES OR MODIFICATIONS TO THIS EQUIPMENT NOT EXPRESSLY APPROVED BY THE MANUFACTURER COULD VOID YOUR AUTHORITY TO OPERATE THE EQUIPMENT.

Appendix C: Servicing the Boca Product

If your Boca product requires service, first contact the authorized dealer from whom you purchased the product. If the dealer is unable to assist you, and you must contact Boca Research, Inc., please follow the instructions below.

Our electronic BBS is available 24 hours a day at (407) 241-1601 and will support data transmission speeds up to 28.8K bps with settings of N, 8, 1. If you have a modem, the BBS may be helpful (especially during off hours) if you have a question about product settings or compatibility, or if you wish to download driver software or utilities.

If the Troubleshooting section did not resolve your problem, you may call our technical support staff for assistance. If you haven't referred to the Troubleshooting section, there's a good chance the solution to your problem is there.

NOTE: CALLING TECHNICAL SUPPORT WITHOUT COMPLETE AND ACCURATE INFORMATION CONCERNING YOUR PROBLEM MAY BE BOTH TIME-CONSUMING AND FRUSTRATING FOR YOU.

1. When calling Boca Research Technical Support, have the following information available:

- Board Name and part number (located on the board)
- Computer Manufacturer
- Computer Model
- Peripherals in system
- Operating System and version

> **If you suspect a problem with a specific program or software package, make note of the name, version or release number, and manufacturer of the software.**

If you suspect a problem with a specific program or software package, make note of the name, version or release number, and manufacturer of the software.

2. Call Boca Research Technical Support Department between the hours of 8:00 a.m. and 6:30 p.m. EST Monday through Friday at (407) 241-8088. A technical support specialist will be available to discuss the problem(s) you are experiencing.

If factory service is required, you will be given a Return Merchandise Authorization (RMA) number. **Please place this number on the outside of the package** when you return the item(s) for service and reference it on any correspondence included in the package. Boca Research, Inc. will return any product which is not accompanied by an RMA number.

3. Refer to the Warranty Statement if the product is covered under the five-year Boca Research, Inc. Limited Warranty.

4. Certain parts will not be covered under the Boca Research, Inc. Limited Warranty. Dealer installed parts are warranted by the dealer. Parts which you have installed yourself are covered only by the supplier's warranties. In these cases, Boca Research, Inc. can identify which parts are defective, but will not replace such parts until specific written authorization is received from you. The cost of parts and labor involved in making such repairs will be billed to you C.O.D.

5. When sending the product to Boca Research, Inc. for repairs, please be sure to include:

   • the Boca Research product **(BEN220 only)**
   • copy of the original invoice
   • your return street address (for UPS purposes)
   • phone number
   • the RMA number mentioned above

   Package the product securely in a container equivalent to the original packaging, and insure the package to protect against loss or damage during

transit. Shipping charges must be prepaid; C.O.D. shipments will not be accepted. Please use the address below for all correspondence:

Boca Research, Inc.
RMA Department - RMA # _____
1601 Clint Moore Road
Boca Raton, FL 33487-2841

6. If the repairs performed on your product were covered by the warranty, Boca Research, Inc. will return it prepaid via UPS.

Limited Warranty

Boca Research, Inc. (BRI) warrants to the original buyer of this BRI product that the hardware is free of defects in materials and workmanship for a period of five (5) years from the date of purchase from BRI or its authorized dealer. Should the product fail to be in good working order at any time during the five-year period, BRI, will at its option, repair or replace this product as described below. This warranty does not cover defects resulting from misuse, abuse, negligence, accident, repairs, or alterations made by either the customer or another party. Boca Research reserves full rights to determine whether a defective product falls into this category.

The entire risk as to the quality and performance of the product rests with the customer. Any written or oral information or advice given by Boca Research dealers, distributors, agents, or employees will in no way increase the scope of this warranty. This warranty applies only to the product described in this manual and not to any other value-added software which may be included.

All products will be serviced and returned via UPS-ground at no charge to customers.

All customers are required to demonstrate proof of purchase when requesting a Return Merchandise Authorization (RMA). The period of service commences on the date of purchase. A copy of the sales slip must be included with the returned merchandise.

Products which require Limited Warranty service during the warranty period should be delivered to BRI at the address in the Appendix (Servicing Your Boca Product) with proof of purchase and the Return Merchandise Authorization (RMA) number provided by BRI Technical Support. Refer to the Appendix in your manual. Replacement parts or complete products will be furnished on an exchange basis only. Replaced parts and/or products become the property of BRI.

If the returned product is sent by mail, the purchaser agrees to prepay shipping charges, insure the product or assume the risk of loss or damage which may occur in transit, and to use a shipping container equivalent to the original packaging. ALL EXPRESS AND IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE FOR THE PRODUCT ARE LIMITED IN DURATION TO THE ABOVE FIVE- AND ONE-YEAR PERIODS, RESPECTIVELY.

UNDER NO CIRCUMSTANCES (WHETHER BASED IN CONTRACT OR TORT) SHALL BOCA RESEARCH BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE, LOSS OF BUSINESS, OR OTHER FINANCIAL LOSS AS A RESULT OF THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR DISRUPTION OF ITS PRODUCTS.

Boca Research reserves the right to make periodic changes or enhancements to any Boca Research product without prior notification, but has no obligation to modify or update products once sold.

This warranty gives you specific legal rights, and you have other rights which may vary from state to state. This warranty is valid only in the United States.

Copyright

Trademarks

Glossary

10BASE-T. Twisted pair cabling using an RJ-45 connector.

10BASE5. Original Ethernet using coaxial cable.

10BASE2. Also known as "cheapernet". Another name for Thin Ethernet using a BNC connector.

802.3. Defined by the IEEE (*Institute of Electrical and Electronics Engineers*), these standards regulate the use of the CSMA/CD (Carrier Sense Multiple Access/Collision Detection network access method used by Ethernet networks.

Address. A unique identifier assigned to networks and workstations so that each device can be separately designated to send and receive messages.

AUI Connector. Attachment Unit Interface; 15-pin "D" connector for use with external transceivers, such as 10BASE5 or fiber optics.

Backbone. Cable on which two or more stations or networks may be attached.

BNC Connector. BNC jacks and plugs connect network hardware via thin Ethernet cable. A BNC barrel connector joins two lengths of thin Ethernet cable.

Boot PROM. (*Boot Programmable Read-Only Memory*). A ROM chip usually mounted on the network interface card that enables a personal computer to load the operating system from the network.

Bus topology. A network topology in which nodes are connected to a single cable with terminators at each end.

Client. A node that requests network services from a server.

Coaxial Cable. Data transmission medium with a single-wire conductor insulated from electromagnetic and radio frequency interference.

Concentrator. See hub.

CSMA/CD. Carrier Sense Multiple Access with Collision Detection. CSMA/CD is the access method used in Ethernet where nodes contend for the right to send data.

Ethernet. A 10 megabits-per-second baseband, CSMA/CD network originally designed by the Xerox Corporation.

File Server. A device on a LAN that provides mass storage of files. A file server can be dedicated (only performs network management functions) or non-dedicated (where user applications can co-exist while the network is available.

Hub. A concentrator or repeater in a star topology at which node connections meet.

Jabber. This occurs when there are excessively long data packets being transmitted from the node (i.e., workstation, server). At that point, the hub, or concentrator, partitions (isolates) the node from the network until the condition is corrected.

LED. Light-emitting diode.

Network topology. The arrangement of nodes usually forming a star, ring, tree, or bus pattern.

Node. Any device including servers and workstations connected to a network; also the point where devices are connected.

Packet. A collection of bits comprising data and control information formatted for transmission from one node to another.

Protocol. A standardized set of rules that specify the format, timing, sequencing, and/or error checking for data transmissions.

Repeater. Used to extend the topology, allowing two or more cable segments to be joined. In a 10BASE-T network, the repeater provides the central connection point where the gathering of statistics and network management functions take place.

Ring Topology. A network topology in which nodes are connected in a closed loop; no terminators are required because there are no unconnected ends.

Server. A computer that provides shared resources, such as files and printers, to the network.

Star Topology. A network topology in which nodes are connected to a common device such as hub or concentrator.

T-Connector. A T-shaped device with two female and one male BNC connectors.

Terminator. 50-ohm coaxial plug used to attach to one end of a BNC T-connector when the associated station is first or last in the group.

Topology. The physical layout of a network. The principal LAN topologies are bus, ring, and star.

Transceiver. An AUI (Attachment Unit Interface) device for receiving and transmitting data that often provides collision detection as well.

Twisted-Pair cable. A wiring scheme with one or more pairs of 18 to 24-guage copper strands.

Index

BOCA
RESEARCH INC

Manual Part # 9414
Rev. 3.1