IOAT™

PRODUCT CODE:
IOAT55

Installation Guide

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.***

Boca BBS
407-241-1601

Automated
Fax Retrieval
System
407-995-9456

Technical Support Fax
407-997-0918

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

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 preceding page.

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.

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Section One: Introduction

Congratulations on purchasing the IOAT55 for the IBM and compatible family of personal computers. Boca Research is a leading manufacturer of video, modem and fax modem, multi-user, IDE-interface, I/O, and memory products. Compatible with ISA or EISA systems, the IOAT55 has one 25-pin parallel port along with one 9-pin and one 25-pin serial port (serial A and DB-25 cable assembly for serial B). It features a convenient half-card size and can be installed in either an 8- or 16-bit slot depending on your needs. Addresses and interrupts used for each port are jumper-selectable.

The IOAT55 also features high-speed buffer 16C550 UART technology. Its 16-byte FIFO buffer can send and receive data with throughput speeds up to a maximum of 115Kbps. The IOAT55's high-speed UART has FIFO buffering to increase data throughput between the host PC and its serial devices. Modem control signals are also provided. *NOTE: Your software must be able to take advantage of the 550 UART's FIFO buffering (this applies to Windows and non-Windows applications alike).*

Take a few minutes now and read this manual before installing the IOAT55 board. Doing so may prevent difficulties later. Our customer support experience has shown that many costly and time-consuming calls to our technical support staff can be avoided with closer attention to the information provided here.

Section Two: Getting Started
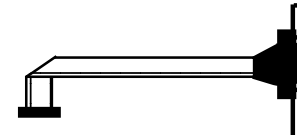
Before going any further, please be sure that the following items have been
included in your IO/AT package:

• The IO/AT board
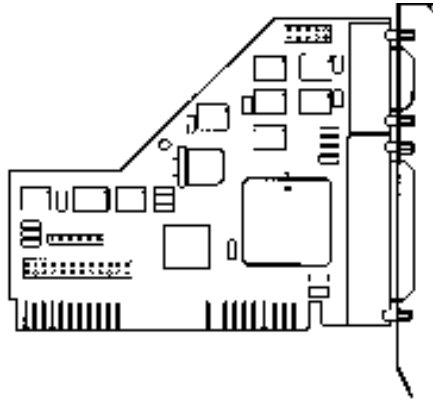
• a serial 9-pin header and DB-25 cable
  and bracket assembly

Please examine the IO/AT board for any visible damage which may have
occurred during shipment. If damage exists or if any items are missing, please
contact the vendor from whom you purchased the IO/AT.

Section Three: Features and Capabilities

You can define each port for a specific application as necessary.

3.1 Parallel Printer Interface

The parallel printer interface has a 25-pin female D-shell connector, and is designed to connect to IBM and IBM compatible printers via an IBM printer cable. This port is IBM PC/AT compatible and it can be set via a jumper for one of the following options:

LPT (0378h) - First parallel port
LPT (0278h) - Second parallel port
DISABLED - No port is visible to system; to disable the parallel port, simply remove both jumpers

IBM has defined 0378 and 0278 as the hexadecimal I/O port address for ports LPT1 and LPT2, respectively. The interrupt for the parallel port is IRQ7 or IRQ5. Parallel ports can be configured under DOS using the same IRQs, but they MUST be different physical port addresses (LPT).

3.2 Serial Device Interface "A"

The IO/AT board is designed using a high speed dual, AT-type 16C550 UART compatible chip for the serial ports. Serial device interface "A" has a 9-pin male D-shell connector, and is used to connect to any asynchronous serial device using a standard EIA RS-232 interface. Examples of such devices are serial printers, plotters, and modems. Serial port "A" can be set via a jumper for one of the following options:

COM1 (03F8h) - First serial port
COM2 (02F8h) - Second serial port
COM3 (03E8h) - Third serial port
COM4 (02E8h) - Fourth serial port
DISABLED - No port is visible to system; to disable the serial port, simply remove both jumpers

The Interrupt Request can be set up as IRQ3, IRQ4, IRQ5, IRQ7, or DISABLED. If you do not have a specific need for this option, select DISABLED.

3.3 Serial Device Interface "B"

This serial device interface has a 9-pin header and DB-25 cable and bracket assembly. Serial device interface "B" (located on the cable and bracket assembly) can be used with the same types of devices as serial device interface "A" described above. Serial port "B" can be set via jumper for one of the following options:

COM1 (03F8h) - First serial port
COM2 (02F8h) - Second serial port
**COM3 (03E8h) - Third serial port**
COM4 (02E8h) - Fourth serial port
DISABLED - No port is visible to system; to disable the serial port, simply remove both jumpers

The interrupt request choices are IRQ3, IRQ4, IRQ5, IRQ7, or DISABLED. If you do not have a specific need for this option, select DISABLED. If you do not need Serial Port "B", keep the logical port DISABLED. NOTE: COM3 and COM4 are not supported by IBM's system BIOS. It will be necessary for your application software to initialize these COM ports. The BIOS in some later systems may allow initializing of these ports. Check your system documentation. If your software is deficient in this area, you may wish to download the file DOSPORTS.EXE from our BBS (407) 241-1601.

Section Four: Setting the Jumpers

Before you install the IO/AT board, you need to set the jumpers for your configuration. Always turn the system off before attempting the reconfiguring, removal, or installation of the IO/AT board.
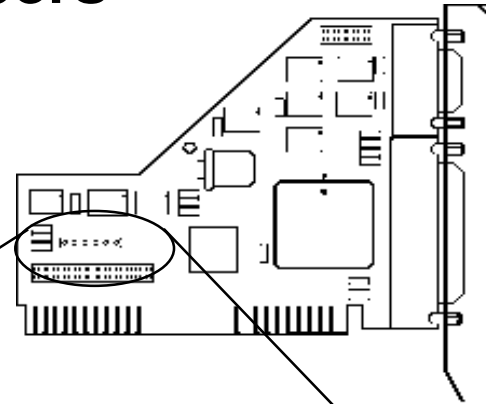
Jumper Locations and Default Settings on the IO/AT Board
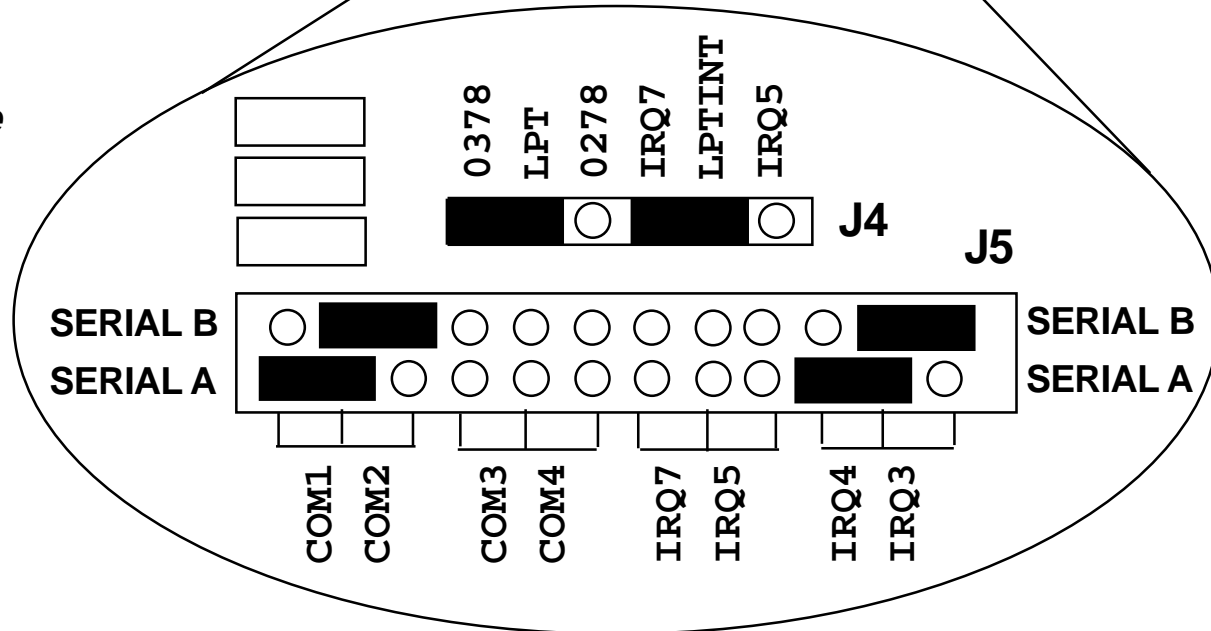
4.1 Introduction

You can change configurations on the IO/AT to suit your needs simply by moving a jumper or combination of jumpers from one pair of pins to another.

See the preceding page for the default settings for an IO/AT being installed in an IBM AT or compatible. In this example, IO/AT is the first I/O board being added to the system and is configured as:

LPT1 - LPT = 0378; LPTINT = IRQ7
SERIAL "A": COM1/IRQ4
SERIAL "B": COM2/IRQ3

4.2 Changing the Default Jumper Configurations

4.2.1 Configuring the LPT Ports

Locate the LPT jumper array approximately in the lower left quadrant of the IO/AT board. The LPT jumper block is the topmost array of jumpers. It consists of a row of six pins, labelled **J4**, divided into two clusters of 3 pins each, labelled 0378, LPT, 0278 and IRQ7, LPTINT, IRQ5, respectively.

Connecting the two leftmost jumpers (0378 and LPT) in the **J4** jumper array configures the parallel port for LPT1 at 378h. If you have an existing LPT1, position the jumper over the second and third pins, labelled LPT and 0278 for an LPT2 at I/O base 278h. Refer to 4.3 Configuring for Interrupts to set the proper interrupts for the parallel ports. If the parallel port is to be DISABLED, then remove the jumpers from the LPT and LPTINT clusters. Refer to 4.4 Disabling an Unused Device or IRQ.

When removing a jumper, pull straight up from the board. To insert a jumper, line up the jumper with the pins and gently push downward until the bottom of the jumper is flush with the base of the pins.

4.2.2 Configuring the COM Ports

The COM port jumpers consist of the left half of the 2x12 matrix located in the lower left quadrant of the board. The jumpers are labelled as COM1, COM2, COM3, and COM4 (vertically) as indicated in the previous diagram.

To set the COM ports, simply move the jumper to the appropriate COM designation and the center pin of either the COM1/COM2 or COM3/COM4 port cluster of the SER B and/or SER A row. Refer to 4.3 Configuring the Interrupts to set the proper interrupts for the serial ports.

If serial port "A" and/or "B" is to be DISABLED, then remove the jumper for that serial port. See 4.4 Disabling an Unused Device or IRQ. *NOTE: Do not place more than one jumper in each row of this section.*

4.3 Configuring for Interrupts

4.3.1 Configuring Interrupts for the COM Ports

The IRQ jumpers consist of the right half of the 2x12 jumper matrix located in the lower left quadrant of the board. The jumpers are labelled as IRQ7, IRQ5, IRQ4, and IRQ3 (vertically) as indicated in the previous diagram. To set the IRQ jumpers, simply move the jumper to the appropriate IRQ designation and the center pin of either the IRQ7/IRQ5 or IRQ4/IRQ3 cluster for the SER B and/or SER A row. In the previous diagram, interrupt request 3 (IRQ3) is enabled for serial device interface "B", and interrupt request 4 (IRQ4) is enabled for serial device interface "A".

Generally, COM1 uses IRQ4 and COM2 uses IRQ3. If your system already contains either of these ports (COM1 or COM2), then you must DISABLE that IRQ on the IO/AT board. If the IRQ is used by two ports, a conflict will result.
Refer to 4.4 Disabling an Unused Device or IRQ. If your software permits, you may use an IRQ5 or an IRQ7 as long as they do not conflict with another device.

4.3.2 Configuring Interrupts for the LPT Ports

The LPTINT jumper block for the parallel ports is in the right half of the topmost jumper array located in the lower left quadrant of the board. It is labelled IRQ7, LPTINT, and IRQ5. In the previous diagram, the parallel port is configured for interrupt request 7 (IRQ7).

Unlike the serial ports, more than one parallel port can be set using the same IRQ. For example, you may set an existing LPT1 and a second parallel port (LPT2 at 278h on the IO/AT) to IRQ7. One exception to this general statement would be if you required a second LPT port for the XENIX (or similar type) operating system; you would select IRQ5 for the second LPT port by jumpering LPTINT and IRQ5. If you wish to use these ports with no IRQ, refer to 4.4 Disabling an Unused Device or IRQ.

4.4 Disabling an Unused Device or IRQ

You can disable a device or IRQ simply by removing the respective jumper. For example, to disable Serial "B", locate the SER B/SER A 2x12 jumper matrix in the lower left quadrant of the IO/AT board. Remove the plastic jumpers currently residing in the top row labelled SER B of the board. *NOTE: To retain the jumper for future use, line up the jumper so that it is covers ONLY the center pin and gently push downward until the bottom of the jumper is flush with the base of the pins.*

Section Five: Physical Installation

The IO/AT board is simple and quick to install—even for the novice computer user. Take a few moments to read over the directions before you begin.

5.1 Basic Installation

1. Remove your system cover, remembering to power down your system first. You may find it necessary to remove other adapter boards or detach cables. If so, make note of where everything goes. Now, select an empty expansion slot. The IOAT functions equally well in either an 8- or 16-bit slot. Choose either depending on convenience. Remove the screw and the metal plate that covers the external access to the slot you have selected.

2. Insert the IO/AT board in the slot you have selected so the edge connector on the bottom rear of the board mates with the socket on the motherboard. Press down firmly on the board. Use the removed screw to secure the board.

3. Slide the cover back over the chassis taking care not to let it catch on the disk drive or power cables. Replace any other adapter boards you may have removed and re-attach any detached internal cables. Once the cover is in place, replace all the screws that you removed earlier. Reconnect all previously removed external cables.

4. Attach the cable(s) for the device(s) you will be using to the appropriate connector and tighten them down with screws attached to the end of the cable(s).

5.2 Installing the Second Serial Device Interface

The IO/AT board is shipped with the serial 9-pin header and DB-25 cable and bracket assembly for serial port "B".

1. Locate an available expansion slot in your computer.

2. Remove the metal bracket that covers the external access to the slot you have selected (if it is present). It should be attached with one screw. Save the screw for when you secure the serial device interface bracket.

3. Attach the ribbon cable to the IO/AT board at the connector labeled serial "B" which is located along the top of the board. The colored stripe on the cable (often red) should be toward the left side of serial "B". Refer to the diagram which follows.

4. Install the metal bracket which contains the 25-pin serial connector in the slot you prepared in step 2. Secure the bracket to the frame with the screw.

Colored stripe
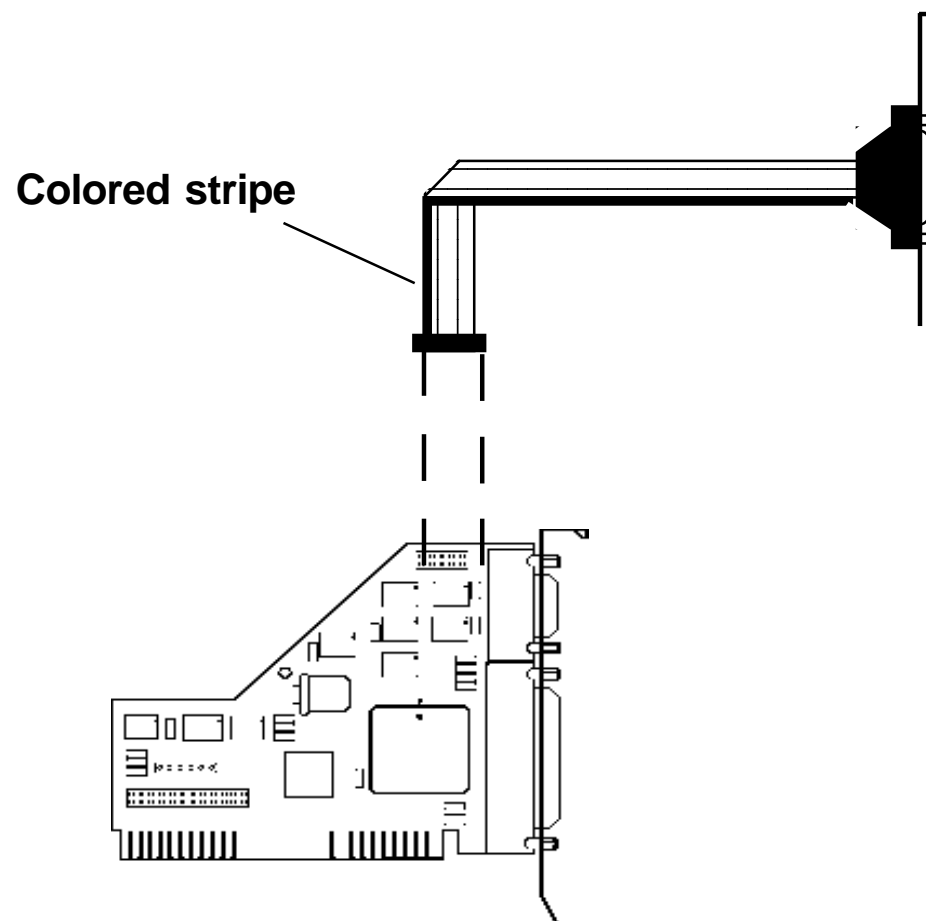
Connecting the Ribbon Cable to the IO/AT Board

Appendix A: Troubleshooting

Before contacting your dealer, please review the following list of problems and solutions to see if any of them apply to your situation.

SYMPTOM	POSSIBLE REMEDY
No response from a peripheral device. (i.e. printer, plotter, modem, etc.)	• Verify that the peripheral device is powered on, ready, on-line, and/or securely connected at BOTH ends of the cable. Be sure the application software is configured to recognize the port that you are attempting to use and that the port in question is actually the port intended to be active. Check the IO/AT jumper settings to insure that the intended port is enabled and that there are no conflicting ports or shared interrupts.
LPT2: will not perform a print screen (shift-PrtSc).	• The system is functioning normally. The print screen function defaults to LPT1. If you wish to test the port after installation copy an ASCII file (note: the example may not exist on your boot disk) to an active device, i.e., COPY AUTOEXEC.BAT LPT2: at the DOS prompt.

SYMPTOM	POSSIBLE REMEDY
COM3 and/or COM4 do not function.	• The system is functioning normally; IBM never intended COM3 or COM4 to be initialized during boot-up. It will be necessary for your application software to initialize these COM ports.
I added this card for a COM2 for a mouse but it won't work.	• The mouse driver software must be aware of the COM2 designation. Refer to your mouse documentation.
I am not sure how to set the IRQs.	• In general, IRQ4 belongs to COM1. IRQ3 belongs to COM2. COM3 and COM4 can be set to DISABLED, IRQ5, or IRQ7. It is best to put an interrupt-driven device on COM1 or 2 (e.g., a mouse) and put a non-interrupt driven device (e.g., a printer) on COM3 or COM4. Avoid sharing IRQs.

Appendix B: Pin Assignments

This section is provided for users who are interested in the pin assignments for each port on the IO/AT.

Parallel Port

Line Name	Pin Number	Line Name	Pin Number
-STROBE	1	-AUTO FeeD	14
DATA BIT 0	2	-ERROR	15
DATA BIT 1	3	-INITialize printer	16
DATA BIT 2	4	-SeLeCT INput	17
DATA BIT 3	5	GROUND	18-25
DATA BIT 4	6		
DATA BIT 5	7		
DATA BIT 6	8		
DATA BIT 7	9		
-ACKnowledge	10		
BUSY	11		
Print End (out of paper)	12		
SeLeCT	13		

Serial Port A (9-pin)

Line Name	Pin #
CARRIER DETECT	1
RECEIVE DATA	2
TRANSMIT DATA	3
DATA TERMINAL READY	4
SIGNAL GROUND	5
DATA SET READY	6
REQUEST TO SEND	7
CLEAR TO SEND	8
RING INDICATOR	9

Serial Port B (Optional) 25-pin

Line Name	Pin #
No Connection	1
TRANSMITTED DATA	2
RECEIVED DATA	3
REQUEST TO SEND	4
CLEAR TO SEND	5
DATA SET READY	6
SIGNAL GROUND	7
RECEIVED LINE SIGNAL DETECTOR	8
No Connection	9
No Connection	10
No Connection	11
No Connection	12
No Connection	13
No Connection	14
No Connection	15
No Connection	16
No Connection	17
No Connection	18
No Connection	19
DATA TERMINAL READY	20
No Connection	21
RING INDICATOR	22
No Connection	23
No Connection	24
No Connection	25

Appendix C: A Special Note to Windows 3.1 Enhanced Mode Users

For optimum performance, use SYSEDIT to edit your SYSTEM.INI file to specify that the IOAT55 has a 16550 Universal Asynchronous Receiver Transmitter (UART). Search for the header [386ENH] and add the following entries to the end of that section.

```
COM1FIFO=1
COM2FIFO=1
COM3FIFO=1
COM4FIFO=1
```

These entries specify whether the FIFO buffer of a COM port's UART should be enabled (1=ON), or disabled (0 or nothing=OFF). If a serial port does not have a 16550 UART, the setting is ignored.

By setting all to "1", all your COM ports are set for FIFO buffering regardless of which ports are presently active. For more information, refer to your Windows documentation.

Appendix D: Servicing Your Boca Product

If your IO AT requires service, first contact the authorized dealer from whom you purchased the IO AT. 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 28.8Kbps 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.

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.

2. Call Boca Research Technical Support Department between the hours of 8:00 a.m. and 6:30 p.m. EST 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 suppliers 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 IO AT to Boca Research, Inc. for repairs, please be sure to include:

- **the Boca Research IO AT(board only)**
- **copy of the original invoice**
- **your return street address (for UPS purposes)**
- **your 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 IOAT55 were covered by the warranty, Boca Research, Inc. will return it prepaid via UPS.

FCC Compliance

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

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

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 an authorized dealer ("the Warranty Period"). Should the product fail to be in working order at any time during the five-year period, BRI, will at its option, repair or replace this product as described below, provided that in BRI's sole determination the part or product has not been abused, misused, repaired, or modified.

All products will be serviced and returned via ground at no charge to customers DURING the first year of service.

All returns for limited warranty service require a Return Merchandise Authorization (RMA). All customers are required to demonstrate proof of purchase when requesting an RMA. The period of warranty commences on the date of purchase. A dated 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, copy of canceled check (if any), and the Return Merchandise Authorization (RMA) number provided by BRI Technical Support. Refer to the Appendix in this 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. BRI does not make any warranties in respect to the product, either expressed or implied, including no implied warranties of merchantability or fitness for a particular purpose, except as expressly provided in this agreement. If any labor, repair, or parts replacement is required because of accident, negligence, misuse, theft, vandalism, fire, water or other

peril; or because of conditions outside of specifications, including, but not limited to, electrical power, temperature, humidity or dust; or by moving, repair relocation, or alteration not performed by BRI, or by any other cause other than normal use, the warranty and maintenance obligations provided herein shall not apply.

BRI SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR FOR LOSS, DAMAGE, OR EXPENSE DIRECTLY OR INDIRECTLY ARISING FROM CUSTOMER'S USE OF OR INABILITY TO USE THE EQUIPMENT EITHER SEPARATELY OR IN COMBINATION WITH OTHER EQUIPMENT, OR FOR PERSONAL INJURY OR LOSS OR DESTRUCTION OF OTHER PROPERTY, OR FROM ANY OTHER CAUSE.

This warranty shall not be applicable to the extent that any provision of this warranty is prohibited by any Federal, state, or municipal law which cannot be preempted. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

BOCA
RESEARCH INC

Manual Part #9182
Rev. 2.1