

**MIO-500
ALL-IN-ONE
EXPANSION BOARD
USER'S MANUAL**

- D12910615 -

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FCC STATEMENT ON CLASS B

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 when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that harmful 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 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.*

NOTICE:

- (1) The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*
- (2) Shielded interface must be used in order to comply with the emission limits.*

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INTRODUCTION

MIO-500 all-in-one expansion board is your Input/Output(I/O), game port and FDD/HDD controller cards in a single board. It eliminates the need to buy separate cards for your parallel and serial ports, game port and disk drive interface.

Setting up the board is easy. The MIO-500 expansion board is equipped with a simple and clearly marked jumpers onboard and can be installed into any 16-bit slot of an IBM PC/AT or 100% compatible system.

FEATURES AND SPECIFICATIONS

SERIAL PORT

- Two RS-232C serial ports
- Supports COM1, COM2, COM3 and COM4 ports addressed at 3F8-3FF, 2F8-2FF, 3E8-3EF and 2E8-2EF
- Supports IRQ2 to IRQ5 Interrupt Request Lines
- Supports DTE/DCE operation
- Equipped with enable/disable function
- Includes a 9-pin connector with individual cable

PARALLEL PRINTER PORT

- One parallel printer port (25-pin female connector)
- Supports two port addresses, 378-37F and 278-27F HEX
- Supports IRQ5 and IRQ7 Interrupt Request Lines
- Equipped with enable/disable function

FLOPPY DISK CONTROLLER

- Supports up to two standard type floppy disk drives
- Supports 360KB, 720KB, 1.2MB and 1.44MB 5.25/3.5-inch floppy disk drives
- Equipped with enable/disable function
- Optional 34-pin floppy disk drive cable

IDE HARD DISK INTERFACE

- Interfaces up to two IDE hard disk drives
- Equipped with enable/disable function
- Optional 40-pin IDE hard disk drive cable

GAME PORT

- One game port
- Includes a 15-pin game port cable
- Equipped with enable/disable function

ONE METAL BRACKET TO MOUNT THE 9-PIN SERIAL PORT AND THE 15-PIN GAME PORT CONNECTORS

TWO-LAYER P.C.B.

ONE YEAR WARRANTY

PACKAGE CHECKLIST

Check and make sure that your MIO-500 package contains the following items:

- MIO-500 all-in-one expansion board
- MIO-500 user's manual
- One 9-pin serial port cable
- One 15-pin game port cable
- One metal bracket to mount the 9-pin and the 15-pin cables
- One 34-pin floppy disk drive cable (optional)
- One 40-pin IDE hard disk drive cable (optional)

If anything is missing, consult your authorized dealer.

BRIEF DESCRIPTION OF THE BUILT-IN FEATURES

The MIO-500 board is equipped with two RS-232C serial ports, one parallel port, one FDD controller, one IDE hard disk interface and one game port. This board can be installed in any 16-bit open expansion slot for the IBM PC/AT or any 100% compatible computer. This chapter provides an overview for each built-in feature onboard.

Caution: *Computer components are easily damaged by static electricity. Be careful to handle the MIO-500 all-in-one expansion board only by its edges. Do not touch any of the metal circuitry, especially the gold contacts, with your hands.*

SERIAL PORTS

The built-in serial ports are RS-232C asynchronous serial communication ports that can be used with modems, serial printers, remote display terminals and other serial devices for asynchronous communication. You can select the interrupt channel IRQ2 to IRQ5 through jumper configuration. Included in the package is a 9-pin connector attached to a 9-pin cable and a metal bracket to mount the connector. The serial ports on your MIO-500 board uses the following system I/O ports:

PORT CONFIGURATION	I/O PORTS
COM1	3F8-3FF HEX
COM2	2F8-2FF HEX
COM3	3E8-3EF HEX
COM4	2E8-2EF HEX

The MIO-500 board adheres to the RS-232C engineering standards. The serial ports can be configured as DTE (Data Terminal Equipment) or as DCE (Data Communication Equipment) signal. You can set the serial port to run in either one of these two Modem Handshake signals: normal or forced true. The default setting is set at normal configuration.

CONNECTING THE SERIAL PORT CABLE

The primary serial port (COM-A) is already installed on the board. Install the secondary serial port into COM-B. Make sure that the colored edge of the cable is aligned to pin 1 of the COM-B connector. Refer to the figure below for the location of the COM-A and COM-B connectors onboard.

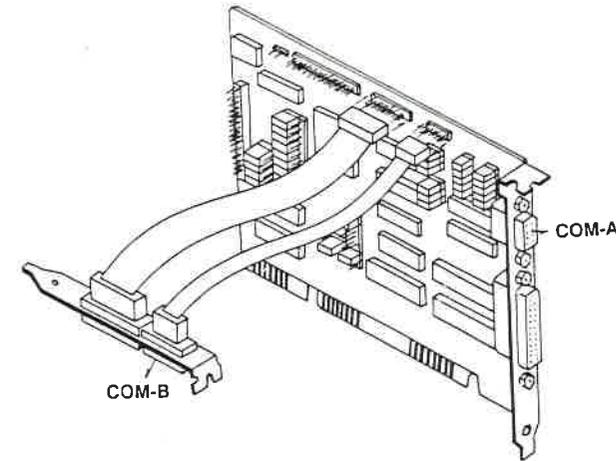


FIGURE 2-1. COM-A AND COM-B CONNECTORS ON THE MIO-500 BOARD

PARALLEL PORT

The MIO-500 board has a standard feature for interfacing your PC to a parallel printer. This port is completely compatible with the IBM PC/AT and uses the same female DB25 connector as an IBM port.

The parallel printer port on your MIO-500 board uses the following system I/O ports:

I/O PORTS
378-37F HEX
278-27F HEX

FLOPPY DISK DRIVE CONTROLLER

The MIO-500 board is equipped with a built-in floppy disk controller that supports up to two standard type floppy disk drives. You can install any 360KB, 720KB, 1.2MB and 1.44MB 5.25/3.5-inch floppy disk drives.

CONNECTING THE FLOPPY DISK CONTROLLER CABLE

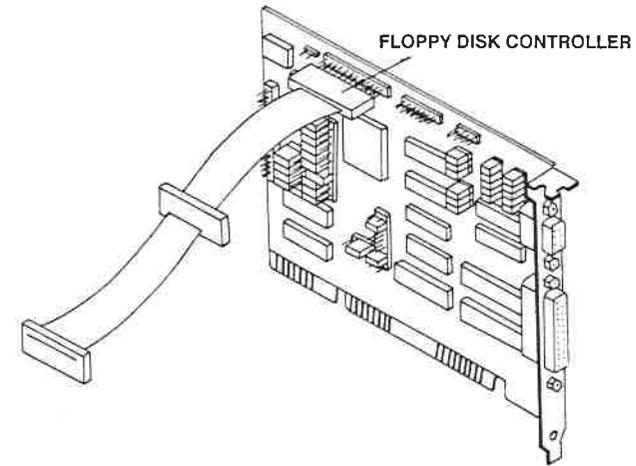


FIGURE 2-2. FLOPPY DISK CONNECTOR ON THE MIO-500 BOARD

Step 1

Install the 34-pin header connector into the floppy disk connector on the MIO-500 board with the colored edge of the ribbon aligned to pin 1.

Step 2

Install the other 34-pin header connector into the disk drive with the colored edge of the daisy chained ribbon cable aligned to pin 1 of the drive edge connector.

IDE HARD DISK INTERFACE

The MIO-500 board is able to interface two IDE (Integrated Drive Electronics) hard disk drives. An IDE drive is a hard disk drive with the controller electronics built into the disk assembly. The integration of the controller and the drive as a single unit increases both the reliability and performance by eliminating redundant circuitry.

Note: *Co-existence of non-IDE drives is not supported.*

CONNECTING THE HARD DISK INTERFACE CABLE

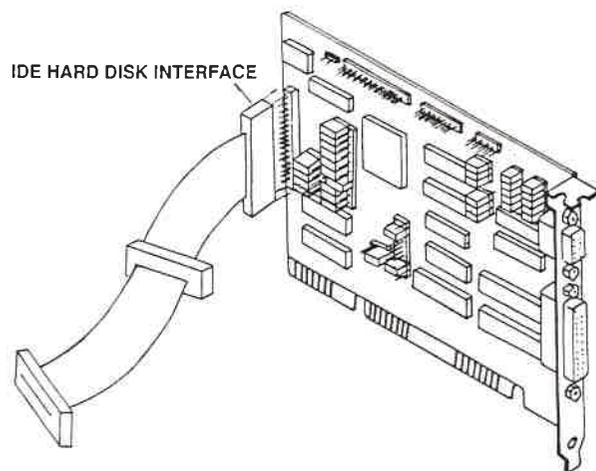


FIGURE 2-3. HARD DISK CONNECTOR ON THE MIO-500 BOARD

Step 1

Install the 40-pin header connector into the hard disk connector on the MIO-500 board with the colored edge of the ribbon aligned to pin 1.

Step 2

Install the other 40-pin header connector into the disk drive with the colored edge of the daisy chained ribbon cable aligned to pin 1 of the drive edge connector.

Note: *Refer to your disk drive owner's manual for information about proper drive select switch settings.*

ADDING A SECOND IDE HARD DRIVE

When using two IDE drives, one must be set as the master and the other drive as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives. No changes are needed on the MIO-500 when adding a second hard drive.

We recommend that both IDE hard drives be from the same manufacturer. In a few cases, drives from two manufacturers will not function properly when used together. The problem lies in the two drives, not in the MIO-500.

PREPARING AN IDE DRIVE FOR USE

IDE disk drives are already low-level formatted, with errors entered, when shipped by the drive manufacturer. To use an IDE drive, you will need to enter the drive type (this information is provided by the drive manufacturer) into the system CMOS setup table. Then run FDISK and FORMAT provided with DOS.

Note: *Do not run FDISK and FORMAT programs on a drive that has been prepared, or you may lose all programs and data stored on the drive.*

GAME PORT

The MIO-500 board is equipped with a game port. You can use any IBM compatible joystick. Included in the package is a 15-pin game port cable. Install the game port as shown below.

CONNECTING THE GAME PORT CABLE

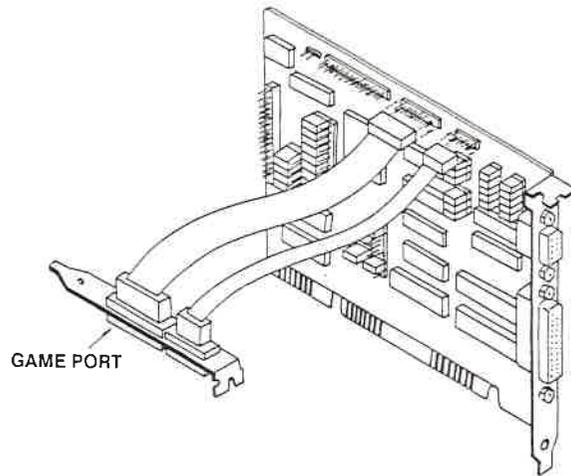


FIGURE 2-4. GAME PORT CONNECTOR ON THE MIO-500 BOARD

THE MIO-500 BOARD LAYOUT

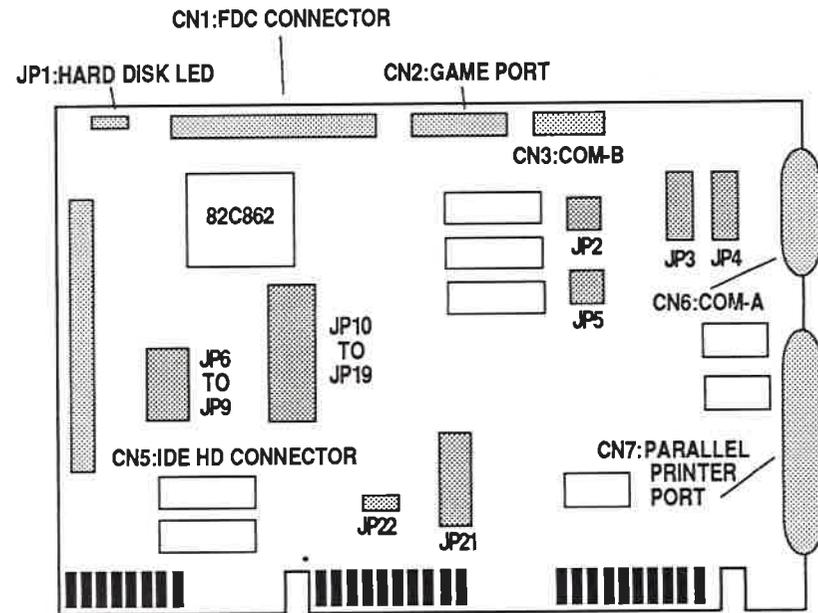
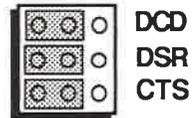


FIGURE 3-1. THE MIO-500 BOARD

JUMPER SETTINGS

PRIMARY SERIAL PORT

JUMPER JP5
NORMAL/FORCED TRUE SETTING

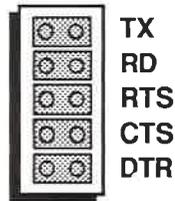


NORMAL
(DEFAULT)

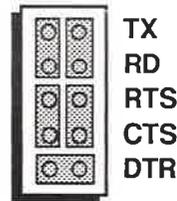


FORCED TRUE

JUMPER JP4
DTE/DCE SETTING

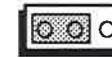


DTE
(DEFAULT)

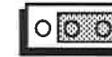


DCE

JUMPER JP11
SELECT PRIMARY SERIAL PORT ADDRESS



COM1:3F8-3FF
(DEFAULT)

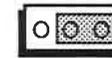


COM3:3E8-3EF

JUMPER JP14
PRIMARY SERIAL PORT ENABLE/DISABLE



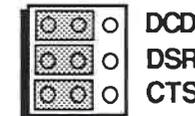
ENABLE
(DEFAULT)



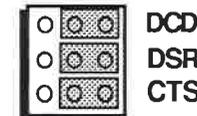
DISABLE

SECONDARY SERIAL PORT

JUMPER JP2
NORMAL/FORCED TRUE SETTING

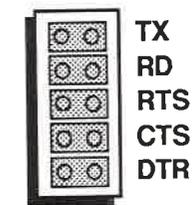


NORMAL
(DEFAULT)

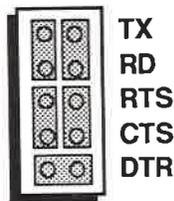


FORCED TRUE

JUMPER JP3
DTE/DCE SETTING



DTE
(DEFAULT)



DCE

JUMPER JP12
SELECT SECONDARY SERIAL PORT ADDRESS

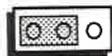


COM2: 2F8-2FF
(DEFAULT)



COM4: 2E8-2EF

JUMPER JP13
SECONDARY SERIAL PORT ENABLE/DISABLE



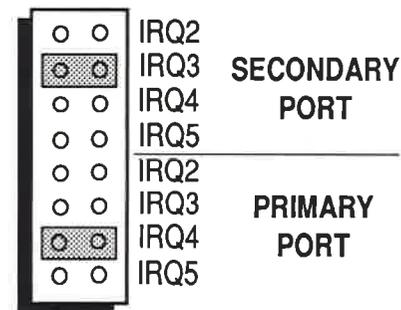
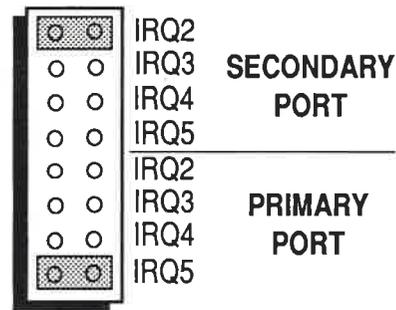
ENABLE
(DEFAULT)



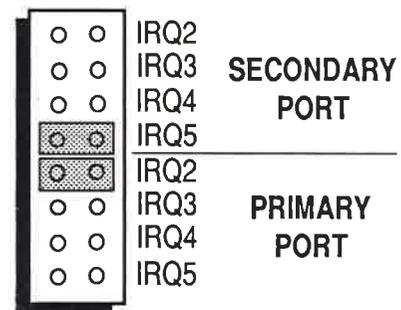
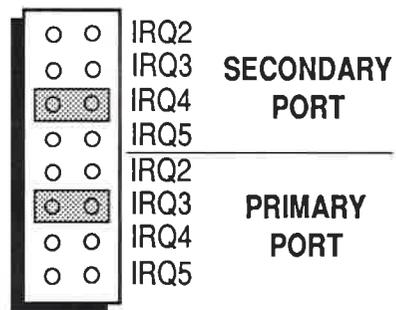
DISABLE

SERIAL PORT IRQ SELECTION

JUMPER JP21
SERIAL PORT IRQ SELECTION



(DEFAULT)



PARALLEL PRINTER PORT

JUMPER JP10
SELECT PRINTER PORT ADDRESS



378-37F
(DEFAULT)



278-27F

JUMPER JP15
PRINTER PORT ENABLE/DISABLE



ENABLE
(DEFAULT)



DISABLE

JUMPER JP22
IRQ5/IRQ7 SETTING



IRQ5(278)

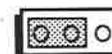


IRQ7(378)
(DEFAULT)

Note: To avoid any conflict, set 378-37F to IRQ7 and set 278-27F to IRQ5.

FLOPPY DISK CONTROLLER

JUMPER JP6
FDC ENABLE/DISABLE

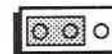


ENABLE
(DEFAULT)



DISABLE

JUMPER JP8
SELECT FDC ADDRESS



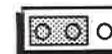
3F1-3F7
(DEFAULT)



371-377

IDE HARD DISK INTERFACE

JUMPER JP7
SELECT HD INTERFACE ADDRESS



1F0-1F7
(DEFAULT)

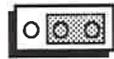


170-177

JUMPER JP9
HARD DISK ENABLE/DISABLE



ENABLE
(DEFAULT)



DISABLE

JUMPER JP17
HARD DISK INTERFACE INSTALLED/NOT INSTALLED



NOT INSTALLED
(DEFAULT)



INSTALLED

Note: When using a separate hard disk controller card, pins 2-3 of jumper JP17 should be capped.

GAME PORT

Jumper JP19
GAME PORT ENABLE/DISABLE



ENABLE
(DEFAULT)



DISABLE

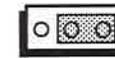
FACTORY SETTINGS

The factory settings are for testing purposes only. Always set these jumpers at their default state. Do not try to reconfigure these jumpers, otherwise problems may occur.

Jumper JP16
ALWAYS DISABLE



ENABLE



DISABLE
(DEFAULT)

Jumper JP18
ALWAYS DISABLE



ENABLE



DISABLE
(DEFAULT)

CONNECTOR PIN ASSIGNMENTS

CONNECTOR JP1 HARD DISK LED CONNECTOR

PIN	ASSIGNMENT
1	LED (+)
2	LED (-)

CONNECTOR CN1 FLOPPY DISK CONTROLLER

PIN	ASSIGNMENT
1	GND
2	RPM
3	GND
4	RSVD
5	GND
6	RSVD
7	GND
8	INDEX
9	GND
10	MOTOR ENABLE A
11	GND
12	DRIVE SEL B
13	GND
14	DRIVE SEL A
15	GND

16	MOTOR ENABLE B
17	GND
18	DIR
19	GND
20	STEP
21	GND
22	WRITE DATA
23	GND
24	WRITE GATE
25	GND
26	TRACK 0
27	GND
28	WR PROTECT
29	GND
30	READ DATA
31	GND
32	HEAD SELECT
33	GND
34	DISK CHANGE

CONNECTOR CN2 GAME PORT

PIN	ASSIGNMENT
1	+5VDC
2	+5VDC
3	BUTTON 4
4	BUTTON 6
5	POSITION 0
6	POSITION 2
7	GND

8	GND
9	GND
10	POSITION 3
11	POSITION 1
12	BUTTON 7
13	BUTTON 5
14	+5VDC
15	+5VDC

CONNECTOR CN3, CN6
PRIMARY AND SECONDARY SERIAL PORTS

RS-232C NAME	PIN	ASSIGNMENT
CF	1	DCD (DATA CARRIER DETECT)
BB	2	RX (RECEIVE DATA)
BA	3	TX (TRANSMIT DATA)
CD	4	DTR (DATA TERMINAL READY)
AB	5	GND (SIGNAL GROUND)
CC	6	DSR (DATA SET READY)
CA	7	RTS (REQUEST TO SEND)
CB	8	CTS (CLEAR TO SEND)
CE	9	RI (RING INDICATOR)

CONNECTOR CN5
IDE HARD DISK INTERFACE

PIN	ASSIGNMENT
1	-RESET
2	GND
3	D7
4	D8
5	D6
6	D9
7	D5
8	D10
9	D4
10	D11
11	D3
12	D12
13	D2
14	D13
15	D1
16	D14
17	D0
18	D15
19	GND
20	KEY
21	RSVD
22	GND
23	-IOW
24	GND
25	-IOR
26	GND
27	IOCHRDY(RSVD)
28	ALE
29	RSVD
30	GND

31	IRQ14
32	-IOCS16
33	A1
34	RSVD
35	A0
36	A2
37	-CS0 (1F0-1F7)
38	-CS1 (3F6-3F7)
39	-ACTIVE
40	GND

16	-INIT
17	-SLCTIN
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND

CONNECTOR CN7
PARALLEL PRINTER PORT

PIN	ASSIGNMENT
1	-STROBE
2	DATA0
3	DATA1
4	DATA2
5	DATA3
6	DATA4
7	DATA5
8	DATA6
9	DATA7
10	-ACK
11	BUSY
12	PAPER EMPTY
13	SELECT
14	-AUTO FDXT
15	-ERROR

APPENDIX A: BLOCK DIAGRAM

