286 MULTI I / O
USER'S MANUAL

Federal Communications Commission Radio Frequency Interference Statement

WARNING: The equipment described herein has been certified to comply with the limites for a Class B computing device, persuant to Subpart J of Part 15 of FCC rules. Operation with non-certified peripherals is likely to result in interference to radio and TV reception. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limites may be attached to the computer.

INSTRUCTION TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manual, may cause interference to radio or to television reception.

If this equipment does cause 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:

1. Reorient the receiving antenna.
2. Relocate the equipment with respect to the receiver.
3. Move the equipment away from the receiver.
4. Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
5. Ensure that card mounting screws, attachment connector screws, and ground wires are tightly secured.
6. Consult dealer service representative for additional suggestions.
7. Use of un-shielded cables with this device will cause radio frequency interference. Therefore shielded cables must be used.
8. Additional information concerning radio frequency interference may be obtained from U.S. Government Printing Office. Washington, D.C. 20402

Stock #004-000-00345-4 this booklet is called: "How to Identify and Resolve Radio-T.V. Interference Problems."

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

286 MULTI I/O ADAPTER USER MANUAL
CONTENTS

1. GENERAL DESCRIPTION

The Serial/Parallel Adapter provides two parallel printer port and two serial port one game, driver for the IBM personal computer PC/AT/XT/ 386 system family.

The serial port of the I/O card performs serial-to-parallel conversion on data characters received from a peripheral device or a MODEM, and parallel-to-serial conversion on data characters received from the CPU. The CPU can read the complete status of the I/O Card at any time during the functional operation. The parallel port of the I/O Card is specifically designed to attach printers, but it can be used as a general input/output port for any device or application that matches its input/output capabilities such as scanner.

Driver supply 5¼" 360K 1.2M 3½" 702K 1.44M Floppy Disk.

2. FEATURES

* Provides Two Asynchronous Communications Elements (ACE1 And ACE2)
  ** Adds or Deletes Standard Asynchronous Communication Bits to or from Serial Data Stream.
  ** Independently Controlled Transmit, Receive, Line Status, and Data Set Interrupts.
  ** Provides A Programmable Baud-Rate Generator.
  ** Provides MODEM Control Functions.
  ** Fully Programmable Serial-Interface Characteristics.
  ** Complete Status Reporting Capabilities.
  ** Internal Diagnostic Capabilities.
  ** Fully Prioritized Interrupt System Controls.
* Provides Two Parallel Ports to Attach Printers.
* GAME Port
* Disk controller.
  ** Supply, 360, 720K 1.2M 1.44M Floppy Disk.
* Single 5 Volt Supply.

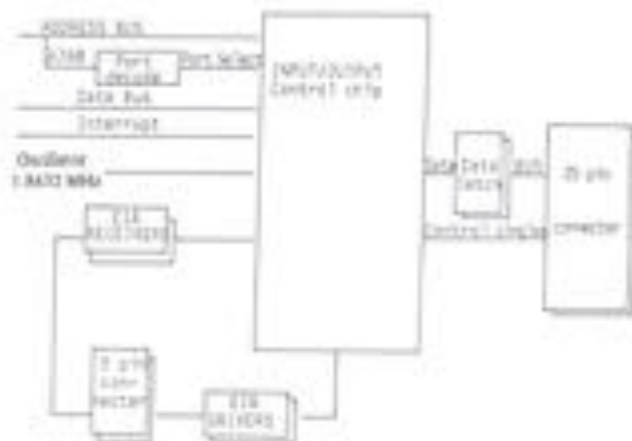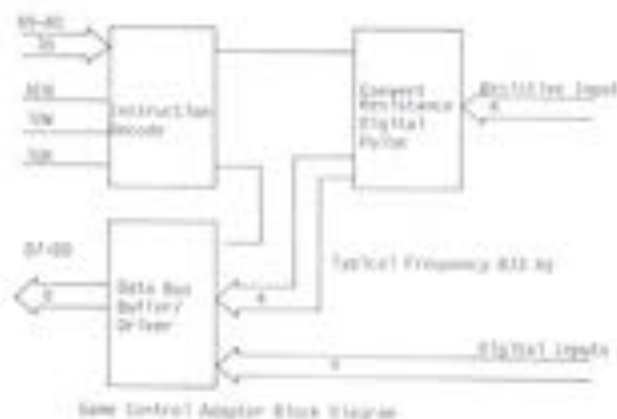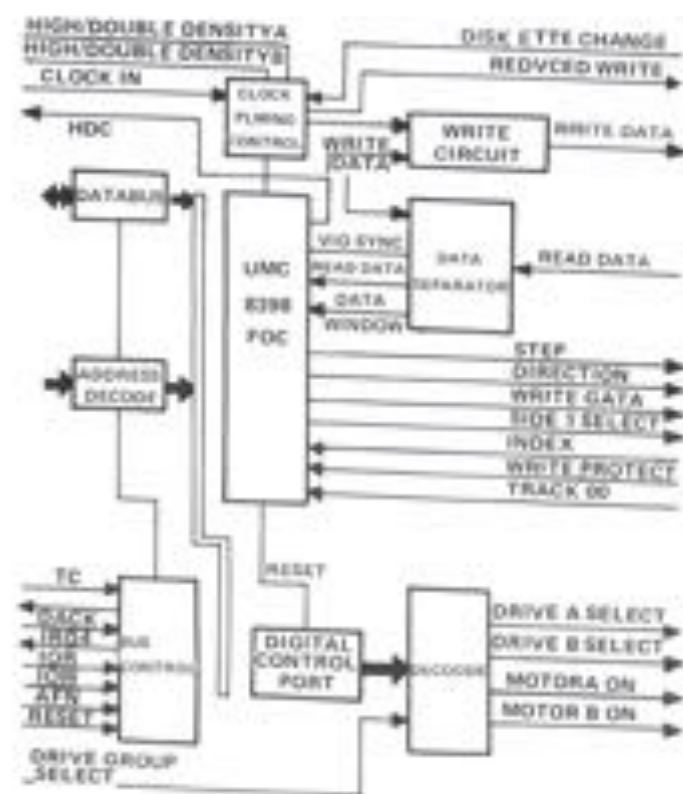## 3. SERIAL/PARALLEL/GAME PORTION BLOCK DIAGRAM

Figure 1.

Game Control Adapter Block Diagram

BLOCK DIAGRAM

The serial ports in the XT/AT and on this card use a DB9P (plug or male) interface connector with a DTE (Data Terminal Equipment) interface configuration. The pinout for both ports is identical at the DB9 connectors and is shown as follows.

DB9 SERIAL PORT PINOUTS

| RS-232C Name	Cable Pin #	Signal Name	Signal Direction
AA	1	(Chassis Ground)	Common
BA	2	TxD (Transmit Data)	Output
BB	3	RxD (Recv Data)	Input
CA	4	RTS (Request to Send)	Output
CB	5	CTS (Clear to Send)	Input
CC	6	DSR (Data Set Ready)	Input
AB	7	SG (Signal Ground)	Common
CF	8	DCD (Data Carrier Detec)	Input
CD	20	DTR (Data Terminal Ready)	Output
CE	22	RI (Ring Indicator)	Input

Most serial peripheral devices use DB25 connectors. Therefore, you will probably need to use a DB9-to-DB25 adapter cable between the AT serial port and the external device. This cable serves the purpose of remapping the DB9 serial pinouts into the standard DB25. (IBM also offers a similar cable.)

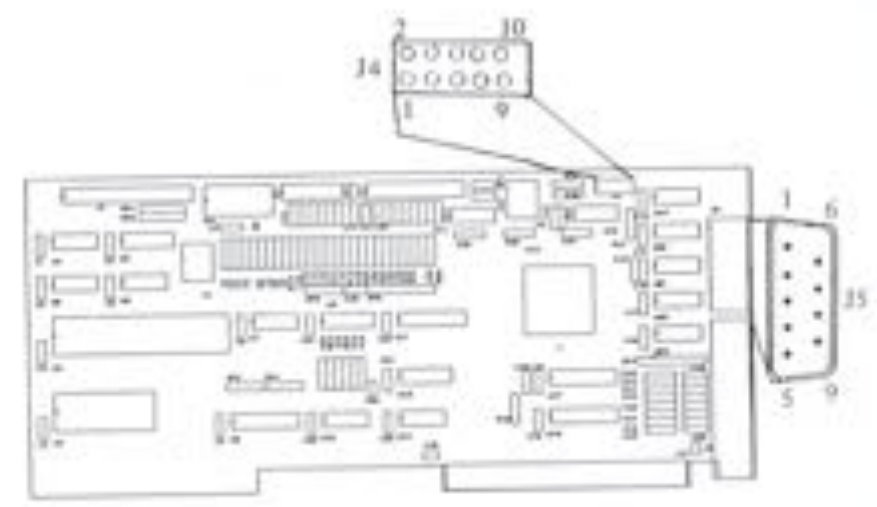| 1 | Carrier Detect DCD | 8 |
2	Receive Data RxD	3
3	Transmit Data TxD	2
4	Data Terminal Ready DTR	20
5	Signal Ground Gnd	7
6	Data Set Ready DSR	6
7	Request to Send RTS	4
8	Clear to Send CTS	5
9	Ring Indicator RI	22

DB9 to DB25 Serial Port Conversion Pinouts
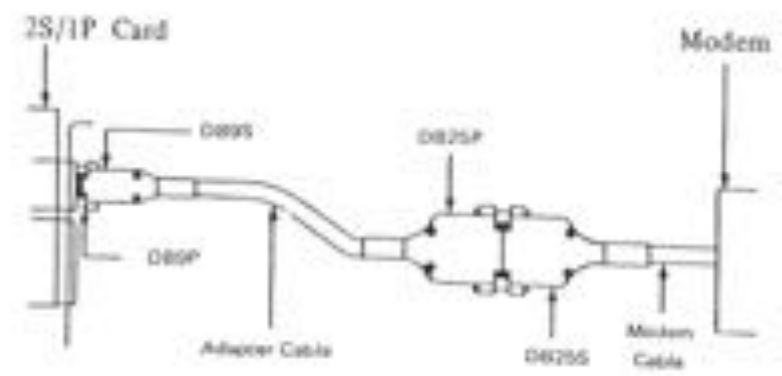
Serial Port Interface Using the DB9-to-DB25 Adapter Cable

5. PIN ASSIGNMENT FOR SERIAL PORT

The following figure shows the pin assignment for the serial port in a communication environment.

External Device	Carrier Detect	1	Serial/Parallel Adapter
	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 pin assignment

Serial Port Configuration.

Port Configuration	I/O Port Address	Interrupt Control
COM 1	3F8-3FF hex	IRQ-4
COM 2	2F8-2FF hex	IRQ 3

Serial I/O pin discription

Pin Name	Pin No (J5)	Pin No (J4)
DCD	1	1
RX	2	2
TX	3	3
DTR	4	4
GND	5	5
DSR	6	6
TRS	7	7
CTS	8	8
RI	9	9
No one		10

6. PIN ASSIGNMENT FOR PARALLEL PORT

The adapter has a 25 pin D-shell connector at the rear of the adapter. The following figure shows the signals and their pin assignment. Typical printer input signals also are shown.

External Device — [pin list] — Serial Parallel Adapter

Signal	Pin
– Strobe	1
Data Bit 0	2
Data Bit 1	3
Data Bit 2	4
Data Bit 3	5
Data Bit 4	6
Data Bit 5	7
Data Bit 6	8
Data Bit 7	9
– ACK	10
BUSY	11
PE	12
SLCT	13
– AUTO FEED XT	14
– ERROR	15
– INIT	16
– SLCT IN	17
Ground	18-25
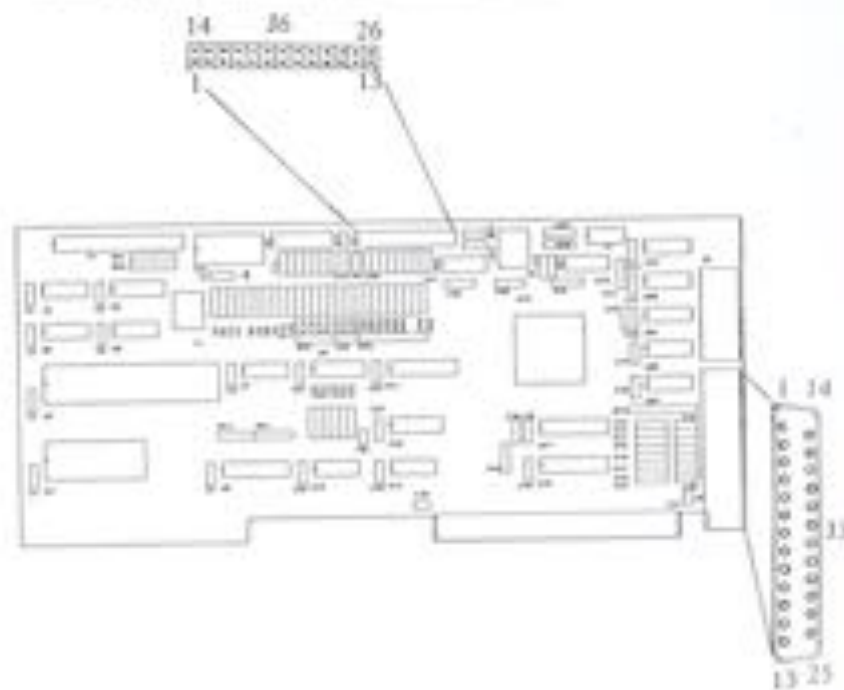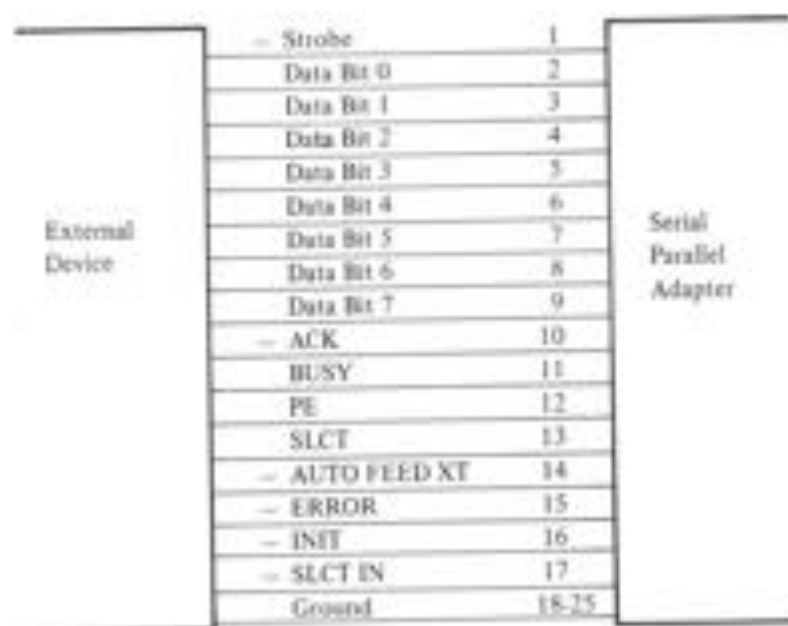
Parallel Port Configuration

Port Configuration	I/O Port Address	Interrupt Control
LPT 1	378-37A hex	IRQ 7
LPT 2	278-27A hex	IRQ 5

Parallel printer I/O pins description

Pin Name	Pin No. (J6)	Pin No. (J3)	IBM Matrix Printer
–STROBE	1	1	1
D0	2	2	2
D1	3	3	3
D2	4	4	4
D3	5	5	5
D4	6	6	6
D5	7	7	7
D6	8	8	8
D7	9	9	9
–ACK	10	10	10
BUSY	11	11	11
PE	12	12	12
SLCT	13	13	13
–AUTO FEED	14	14	14
–ERROR	15	15	15
–INIT	16	16	16
–SLCT IN	17	17	17
GROUND	(18-25)	(18-25)	(18,19-30,33)
no use		26	

7. GAME ADAPTER PORT

Game Adapter Port is optional to the users, it can be used by installing a IC (558) in U9 and IC (74 F 244) in U8 , with one game adapter cable, IBM-compatible joy stick may be used.

GAME CONTROL ADAPTER PIN ASSIGNMENTS

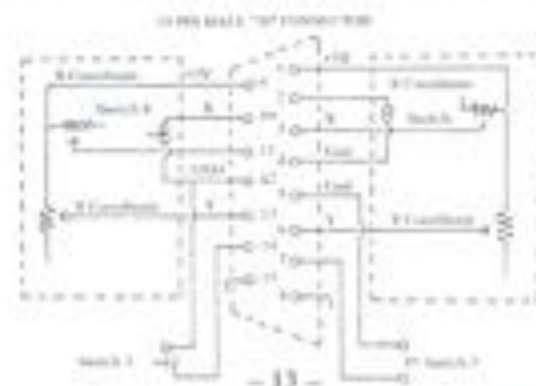The 286 Multi I/O card uses a 15 pin female "D" connector for the game control adapter.

Installing Game Port Cable

The game port cable is optional to, user can get it from dealer to bring the game port interface out the rear of the PC. This cable is approximately 50 cm long and has a rectangular connector at one end and a female DB15S connector at the other end. DB15S connector can mount on the additional bracket supplied, and mount the bracket on the rear panel. The rectangular connector plug into the J2 with red or blue color side of ribbon cable as Pin 1.The IBM-compatible joy-stick DB15P male connector connect to the DB15S connector. Then the user can enjoy the game by executing game software with the joystick.
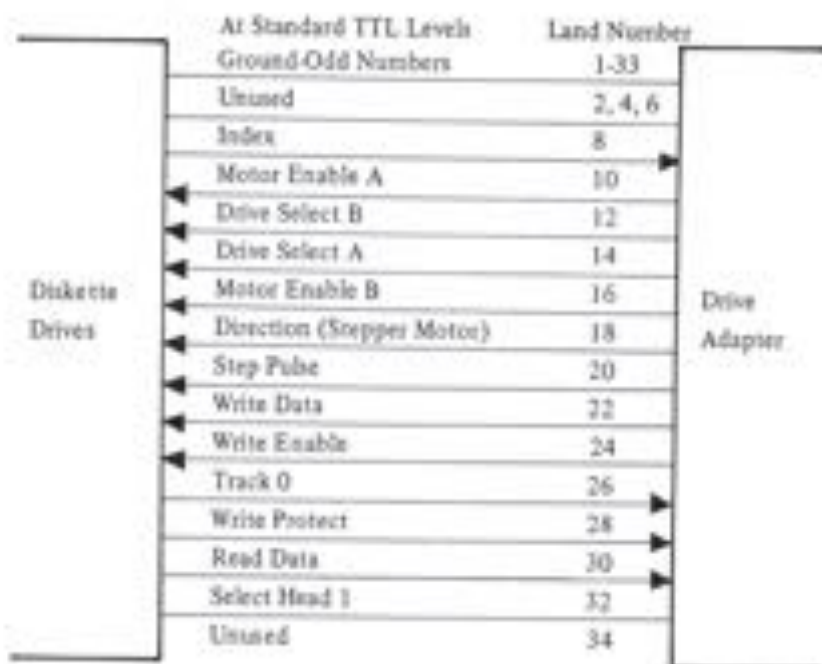
Game Port Pinout

Line Name	J2 Pin	Cable Output DB-15S
+5VDC	1	1
Button 4	2	2
Position 0	3	3
Ground	4	4
Position 1	6	6
Button 5	7	7
+5VDC	8	8
+5VDC	9	9
Button 6	10	10
Position 2	11	11
Ground	12	12
Position 3	13	13
Button 7	14	14
+5VDC	15	15

THE PIN ASSIGNMENT FOR GAME CONTROL ADAPTER

8. DRIVER CONTROLLER

At Standard TTL Levels		Land Number
Ground-Odd Numbers		1-33
Unused		2, 4, 6
Index		8
Motor Enable A		10
Drive Select B		12
Drive Select A		14
Motor Enable B		16
Direction (Stepper Motor)		18
Step Pulse		20
Write Data		22
Write Enable		24
Track 0		26
Write Protect		28
Read Data		30
Select Head 1		32
Unused		34

Diskette Drives ... Drive Adapter

Drive Type Register

The drive type register is a 4-bit read-only register used to set the drive type. This register is used only when FDC control ROM at ON condition. The bits definition are given in the following:

| Bit 0	Drive A Type — Drive A is double density when this bit is '0' and high density when this bit is '1'.
Bit 1	Drive B Type — Drive B is double density when this bit is '0' and high density when this bit is '1'.
Bit 2	Ground
Bit 3	Ground

Fixed Disk Status Register

The contents of the 8-bit fixed disk status register will be checked when system BIOS executes test 2. This register could be enabled when PC system has no Hard Disk Control card and bit 7 should be high '1'. This register should be disabled when PC system has Hard Disk Control card.

The I/O addresses of these seven registers mentioned above are given in the following:

Primary	Secondary	Read	Write
3F1	371	Drive type register	
3F2	372		Digital output register
3F4	374	Main status register	Main status register
3F5	375	Diskette data register	Diskette data register
3F7	377	Digital input register	Transfer rate register
1F7	177	Status register*	

9. HOW TO SELECT THE 2 SERIAL/2 PARALLEL GAME/DRIVER PORT

SW1   ON: disable
       OFF: enable

JUMP1 = GAME.

XT	AT
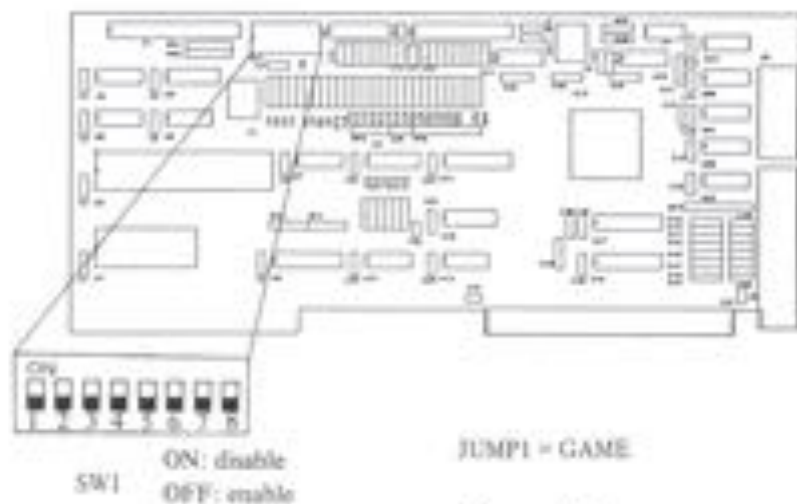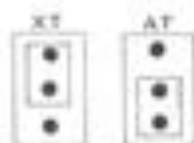
DIP SW1: CM1	DIP SW5 = Primary drive group
DIP SW2: LPT2	DIP SW6 = Drive B is high density drive
DIP SW3: CM2	DIP SW7 = Drive A is high density drive
DIP SW4: LPT1	DIP SW8 = Without HDC in system

The user can disable any other port, only change the DIP SWITCH ON/OFF position.