P500

CHARACTERISTICS

Microprocessor	i386SX (P9) 16-bit bus
Clock	16 MHz
Architecture	MICROCHANNEL
Memory	The motherboard supports 16 MB: **With 286 KB SIMMs** Total memory on system board 1 MB not expandable. **With 1 MB SIMMs** - 2 banks of 2 MB on motherboard - 4 banks of 2 MB on expansion board **MEM 26-503** - 4 banks of 2 MB on another memory board. Modules that can be installed in the memory banks are SIMM 1 MB x 9 **EXM 26-502**
Memory access	100 ns
Coprocessor	I80387 SX
Floppy Disk	1.44 MB 3.5" Panasonic J-257 1.44 MB 3.5" Sony MP-F17 1.44 MB Mitsubishi MF355C
Hard Disk	40 MB 3.5" NEC 3146H ST506 40 MB NEC D3142 ST506 40 MB FUJITSU M2227 ST506 80 MB 5.25" CDC ESDI 135 MB 5.25" NEC D5655 ESDI 135 MB 5.25" Micropolis 1654-7 ESDI
Streaming Tape	40 MB IRWIN 245 - 80 MB IRWIN 285
AT expansion slots	6 Present - 5 Available
Video adapter	Integrated on System Board - VGA compatible PVGA1
Floppy Disk controller	Integrated on System Board. FDC 8272A

Hard Disk controller	1) GO787 WD1006V
	   ST506 interface
	2) GO788 WD1007V
	   ESDI interface
	3) GO525 ESDI interface

CMOS RAM	64 bytes for the Set-up and 8 KB expanded CMOS
ROM BIOS	128 Kb (2x27C512)
Mouse	PS/2- AT-compatible GRD 25-025
Keyboard	101/102-key ANK 26-101 ANK 26-102

MOTHERBOARD

p1.4 BA823 1 MB
      BA827 2 MB

p5   BA242 1 MB
      BA243 2 MB

BIOS

Last level:
Rev. 1.18 on all boards.
For the various
versions, see table
Compatibility Notes

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POWER SUPPLY

PS13A 220 V

PS13A 110 V

CONSOLE

CO 131
1) NASC level

HARD DISK CONTROLLER

GO787 ST506
1) Level: NASC
2) Level: 0.3 MI

GO788 ESDI
1) Level: NASC

GO525 ESDI
1) Level: NASC
2) Level: 0.1 MI

GO564
1) Level: NASC

SYSTEM BOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS
BA823	Lev. Nasc.	412445 M	ROM H PB - UDB13 ROM L PB - UDA13 Rev. 1.03	See the table on the next page
	Lev. 0.1		Rev. 1.03	RETROFITTING
	Lev. 0.2		Rev. 1.03	RETROFITTING
	Lev. 0.3		ROM H PBV1 ROM L PBV2 Rev. 1.05	RETROFITTING
	Lev. 0.4		Rev. 1.05	RETROFITTING
	Lev. 0.5		Rev. 1.05	RETROFITTING
	Lev. 0.6		ROM H PBV6 ROM L PBV7 Rev. 1.06	Corrects the 3270 problem
	Lev. 0.7		Rev. 1.06	Corrects the ATTACHMATE problem
	Lev. 0.8		ROM H PBV8 ROM L PBV9 Rev. 1.09	Corrects the real time clock problem
	Lev. 0.9		ROM H PPU2 ROM L PPU3 Rev. 1.14	Corrects video problems
	Lev. 10		ROM H PPU4 ROM L PPU5 Rev. 1.16	Corrects system parity
	Lev. 11		ROM H PPJL ROM L PPJH Rev. 1.18	Solves Adapter IBM 8514/A problems, of SW IBM 4700 in banking environment and PS/2-compatible Microsoft mouse.
	Lev. 12		Rev. 1.18	Cutting and trimming to solve problems of the "Parallel Processor AOX" board.
	Lev. 12		Rev. 1.18	To solve configuration problems with the OS/RAM32 board, a 47 pF capacitor has been mounted between pins 4 and 10 of component 74F245 at location UGA12. Applied at field level only.
BA827	-		This board has evolved in the same way as BA823.	

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS
BA242	Lev. Nasc.		ROM H PPU4 ROM L PPU5 Rev. 1.16	See the table on the next page.
	Lev. 0.1		Modified 32.768 KHz oscillator circuit	
	Lev. 0.2		ROM H PPJL ROM L PPJH Rev. 1.18	Solves Adapter IBM 8514/A problems, of SW IBM 4700 in banking environment and PS/2-compatible Microsoft mouse.
	Lev. 0.3		Rev. 1.18	Cutting and trimming to solve problems of the "Parallel Processor AOX" board.
	Lev. 0.3		Rev. 1.18	To solve configuration problems with the OS/RAM32 board, a 47 pF capacitor has been mounted between pins 4 and 10 of component 74F245 at location UGA12. Applied at field level only.
BA243	-		This board has evolved in the same way as BA242.	

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INTEGRATED CONTROLLERS	INTEGRATED CONTROLLERS

i386SX CPU
80387SX Coprocessor
8272 Floppy disk Controller
8259A Two Interrupt Controllers
82308 MCA BUS Control
    Compatibility with the Microchannel BUS
    Support for 8 - 16 - or 32-bit data transfers
82307 DMA controller and Interrupt Arbiter
    8 DMA channels
    Refresh generation for memory
    boards on BUS
    Interface between CPU and Coprocessor
    Decode of I/O device interrupts
    DMA controller
16550 Serial port controller
MV146818 RTC and 64 Byte of CMOS RAM
	82309 Address BUS Controller
	    RAM refresh cycle management
	    RAM access control
	    ROM BIOS access control
	    Decode of the addresses of devices on the
	    system board
	    Implements the error recovery registers at
	    given I/O addresses
	82306 Local Channel Support Controller
	    Floppy Disk subsystem support
	    I/O address decode
	    8254 compatible programmable timer
	    System POS registers
	    Registers for the system board functions
	    NMI logic
	8742 Keyboard controller
	PVGA1 Video adapter

BOARDS

FUNCTION	DESCRIPTION	D.R.S. CODE	CHARACTERISTICS
CPU motherboard	BA823	412445 M	P1.4 printed level - 1 MB of memory
CPU motherboard	BA827	412519 P	P1.4 printed level - 2 MB of memory
CPU motherboard	BA242	-	P5 printed level - 1 MB of memory
CPU motherboard	BA243	-	P5 printed level - 1 MB of memory
Console board	CO131	951747 F	
Power supply	PS13A	412446 N	
Hard disk controller	GO787	412449 Z	ST506 controller
Hard disk controller	GO788	412450 W	ESDI controller
Hard disk controller	GO525	412814 F	ESDI controller
Hard disk controller	GO564	-	ESDI controller replaces GO525

PAL

CODE	FUNCTION	POSITION	EVOLUTION
PRS4	Reset circuit	UF13A	PLSN
WS	RTC & CMOS RAM	U17C	
SG	Clock circuit	UCC9	
HS	Clock circuit	UD9	
SL	POS registers	UN4	
SK	VGA circuit	UJ5	SM
CSLA	Keyboard controller 872	RT4	

USER DISKETTE

LEVEL	COMPATIBILITY
1.06 update 4	BIOS 1.09
1.07 update 2	BIOS 1.14
1.08 update 2	BIOS 1.16 Solves: - Video test problems responsible for system crashes - The hard disk test problem which indicates test that has been passed even when the hard disk is not connected.

COMPATIBILITY NOTES

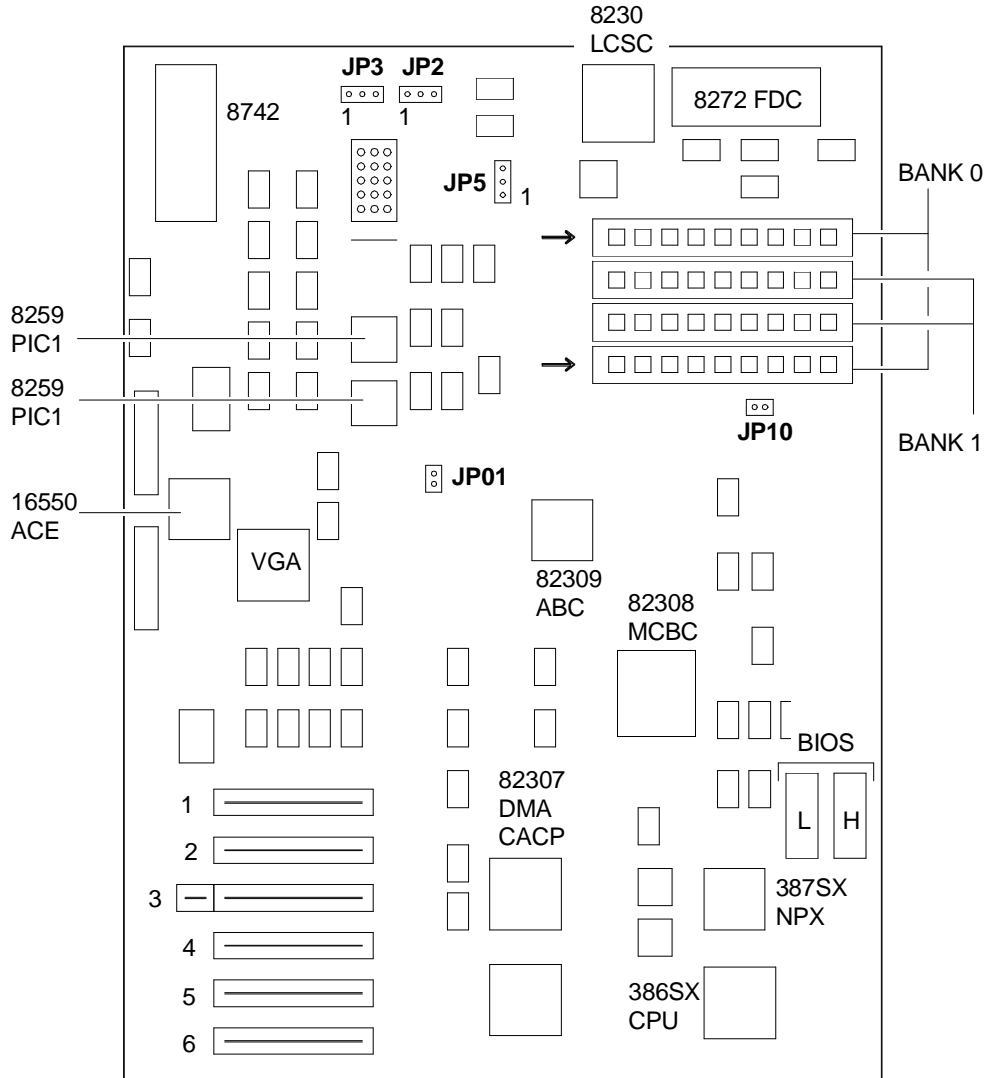| BOARD or HW/SW DEVICE	DESCRIPTION
ROM BIOS 1.06	Solves: Handling problems with IBM 3270 board
ROM BIOS 1.09	For use with the user diskette Ver. 1.06 upd 4 Solves: "Real Time Clock" random errors

ROM BIOS 1.14	Solves: - System crashes during initialization of the mouse drive if the network password is enabled. The Keyboard controller can not accept the password
	    - Problem with the Intel chip set during access to the system board port 107h.
	    - Problem with the "Monitor detect routine" when the monitor is not present
	    - Problem in hard disk initialization when an error is found in the configuration of the HD controller even when configured correctly
	    - Problem in initialization of the IBM twin serial port board
	    - Incorrect video management
	    - System slow down caused by operation of Real Time Clock
	    - System crash when the parallel port functions are used under Microsoft OS/2 and the ABIOS interface
	    - ABIOS initialization problems

ROM BIOS 1.16	Solves: Compatibility problems with standard VGA

ROM BIOS 1.18	Solves: - PS/2 mouse faults
	    - IBM 8514/A installation problems
	    - Parity error when BUS is loaded with different boards
	    - SW IBM 4700 problems in banking environment

GO525/GO564	GO564 replaces GO525 to unify stock
ME064 memory board	Board TECMAR Rev. A (ME064 NA) is changed to solve a parity error problem. Board TECMAR Rev. B (ME064 NA/A) being produced does not have this problem

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HARD DISK CONTROLLER

	LEVEL	D.R.S. CODE	ROM BIOS	NOTES
GO787	Nasc. Lev. 0.3 MI	412449 Z		Replacement of components. No change in functions
GO788	Nasc.	412450 W	ROM BIOS Ver. R.2020 Firmware Ver. 7.8	Replaced by the GO525 to solve some problems
GO525	Nasc.	412814 F	ROM BIOS Ver. R.2.031 Firmware Ver. 7.11-02	Solves: - Crashes in OS/2 ver. 1.10 environment with 2 units installed. - Incorrect management of accesses to alternative tracks.
	Lev. 0.1		Firmware Ver. 7.11-05	Solves: - Incorrect management of installation of NOVEL Netware 286 v.2.15. - Impossibility of formatting a HDU with a Defect List with only one defect. - Incorrect management of read accesses to alternative sectors even with Retries disabled.
GO564	Nasc.	-	-	Replaces GO525

INSTALLABLE HARD DISKS and BUS ARBITRATION LEVELS

TYPE	CAPACITY	MODEL	INTERFACE	BUS ARBITRATION LEVEL
6	20 MB	Seagate ST 125	ST506	3
16	20 MB	Miniscribe 8425F	ST506	3
3	40 MB	NEC D3142	ST506	3
13	40 MB	NEC D3146H	ST506	3
22	40 MB	Fujitsu M2227	ST506	3
27	40 MB	Toshiba MK134F	ST506	3
-	80 MB	CDC 94216-106	ESDI	3
-	135 MB	NEC D5655	ESDI	3
-	135 MB	Micropolis 1654-7	ESDI	3

P4.1 MOTHERBOARD COMPONENTS AND JUMPERS

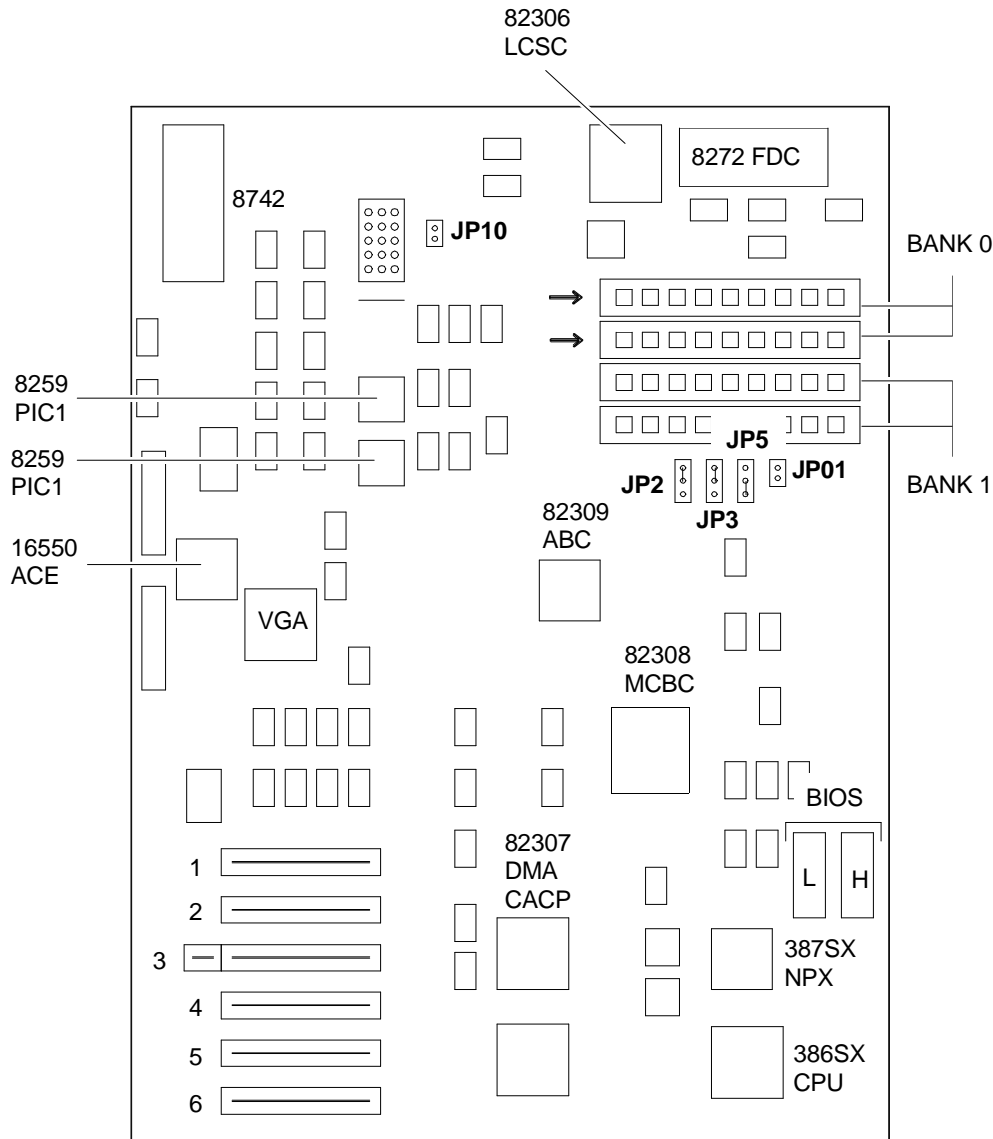|			
JP01	**IN**	One memory bank only installed (1MB SIMM) MEM 2 MB	
	OUT	Two memory banks installed (4 246 Kb SIMMs or 4 1 MB SIMMs) 1 or 4 MB memory	
JP2 & JP3	**Position 1-2**	RAS 0 enable (bank 0)	
	Position 2-3	RAS 1 enable (bank 0 and bank 1)	
JP5	**Position 1-2**	1 MB SIMM Modules	
	Position 2-3	256 Kb SIMM Modules	
JP10	**IN**	Disables the password at power-up	
	OUT	Normal position	

P5 MOTHRBOARD COMPONENTS AND JUMPERS

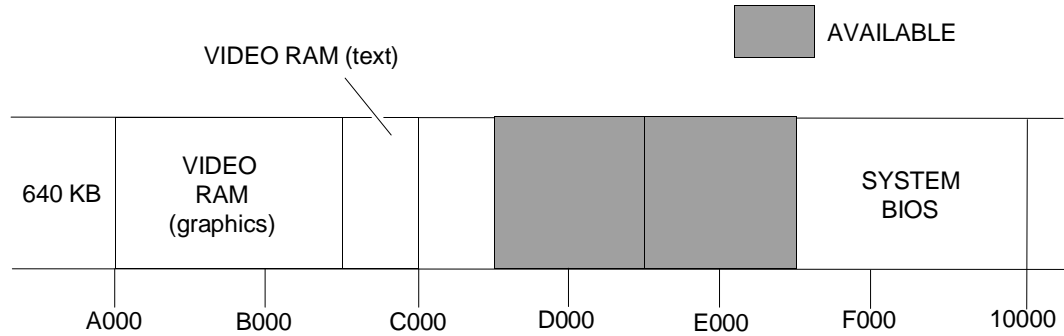| JP01 | **IN** One memory bank only installed (2 1MB SIMM). MEM 2 MB |
	OUT Two memory banks installed (4 246 Kb SIMMs or 4 1 MB SIMMs) 1 or 4 MB memory
JP2 & JP3	**Position 1-2** 1 MB installed on system board
	Position 2-3 2 or 4 MB installed on system board
JP5	**Position 1-2** 1 MB SIMM Modules
	Position 2-3 256 Kb SIMM Modules
JP10	**IN** Disables password at power-up
	OUT Normal position

SOFTWARE COMPATIBILITY

OPERATING SYSTEMS	NOTES
IBM DISK Operating System, Version 4.00	During installation on hard disk, a formatted DSDD disk is required.

HARDWARE COMPATIBILITY

MODEMS	I/O INTERFACE PRODUCTS
Hayes Smartmodem 1200P Hayes Smartmodem 2400P IBM PS/2 300/1200 Internal Modem/A (6450349)	FUTURE DOMAIN HOST ADAPTER (MCS-350) IBM PS/2 Dual Async Adapter/A (6450347)
EXPANSION MEMORIES	**MOUSE**
IBM PS/2 80286 Memory Exp. Option INTEL Aboveboard/2 Orchid Ramquest extra 16/32	IBM PS/2 Mouse (6450350) Microsoft Serial Mouse MSC PC Mouse PS/2 Olivetti New Advanced Mouse (GRD 25-025)
DISPLAY UNITS	**NETWORKING & LAN PRODUCTS**
IBM PS/2 Monochrome Display 8503 IBM PS/2 Color Display 8512 IBM PS/2 Color Display 8513 IBM PS/2 Color Display 8514	IBM PC Network IBM PC Network (Baseband Adapter) IBM Token Ring Network Novell Network 3COM Network (Ethernet) 10NET Network
GRAPHICS PRODUCTS	**OTHER PRODUCTS**
IBM PS/2 Display Adapter 8514/A MATROX PG2 - 1281 HI-RES Graphics Controller	SOFTWARE SECURITY Parallel Port Block

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SYSTEM MEMORY MAP

ADDRESS	SIZE	FUNCTION
00000000 - 0009FFFF	640 K	System RAM - Bank 0 on motherboard
000A0000 - 000BFFFF	128 K	Video RAM
000C0000 - 000DFFFF	128 K	I/O ROM
000E0000 - 0000FFFF	128 K	System Board ROM
00100000 - 0025FFFF	1408 K	System RAM Bank 0
00260000 - 0045FFFF	2048 K	System RAM Bank 1
00460000 - 00FDFFFF	11776 K	Memory expansion board
00FE0000 - 00FFFFFF	128 K	System Board ROM

DMA CHANNELS

CHANNEL	FUNCTION
0	DMA 0
1	DMA 1
2	Floppy disk
3	DMA 3
4	DMA 4
5	DMA 5
6	DMA 6
7	DMA 7
8	EXP. SLOT
9	EXP. SLOT
A	EXP. SLOT
B	EXP. SLOT
C	EXP. SLOT
D	EXP. SLOT
E	EXP. SLOT
F	386SX CPU

INTERRUPT LEVELS

LEVEL	FUNCTION
RQ0	Channel 0 of output timer
IRQ1	Keyboard interface
IRQ2	Interrupt from PIC2
IRQ3	Available
IRQ4	Primary serial port
IRQ5	Parallel port 2
IRQ6	Floppy disk controller
IRQ7	Parallel port 1
RQ8	Real Time Clock
IRQ9*	Reserved
IRQ10	Available
IRQ11	Available
IRQ12	Mouse
IRQ13	Coprocessor
IRQ14	Hard disk controller
IRQ15	Available

* Redirected via software to IRQ2

CMOS MEMORY MAP (SETUP)

BYTE	FUNCTION	BYTE	FUNCTION
00-0D	R.T.C	18	Expansion RAM most significant byte
0E	Reserved		
0F	Protected mode or Virtual mode	19	Hard disk unit type C
10	Floppy disk type	1A	Hard disk unit type D
11	Reserved	1B-2D	Reserved
12	Hard disk unit type C and D	2E-2F	Address control 10-2D
13	Reserved	30	Least significant byte of RAM Total
14	System configuration		
15	RAM low byte	31	Most significant byte of expansion RAM
16	RAM high byte		
17	Expansion RAM least significant byte	32	Information on the data
		33-37	Reserved
		38-3F	Password

I/O ADDRESS MAP

ADDRESS	FUNCTION	ADDRESS	FUNCTION
000- 01F	DMA controller	0C0-0DF	DMA channel 4-7
020-021	First interrupt controller	100-1EF	POS registers
022-03F		1F0-1FF	Hard disk controller
040	Timer	200-277	
041		2F8-27A	Parallel port 3
042-044	Timer	27B-27F	
045-046		2F8-2FF	Serial port 2
047	Timer	300-377	
048-05F		378 - 37A	Parallel port 2
060	Keyboard controller	37B-3B3	
061	System Port B controller	3B4-3B5	Video adapter
062-063		3B6-3B9	
064	Keyboard controller	3BA	Video adapter
065-06F		3BB	
070-091	RTC/CMOS and NMI mask	3BC - 3BF	Parallel port 1
072-073		3C0-3C9	Video adapter
074-076	CMOS RAM expansion	3CA-3CD	
077-07F		3CE-3CF	Video adapter
080-08F	DMA registers	3D0-3D3	
090	POS registers	3D4-3D5	Video adapter
091	Selected board register	3D6-3D9	
092	System Port A controller	3DA	Video adapter
093		3DB-3EF	
094-095	POS registers	3F0 - 3F7	Hard disk controller
096-097	POS registers	3F8 - 3FF	Serial port 1
098-09F		400-FFFF	
0A0-0A1	Interrupt controller 2	8000F8-8000FF	Coprocessor
0A2-0BF			

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