M300-28 / PCS44

CHARACTERISTICS

Microprocessor	INTEL 486 SX
Clock	25 MHz
Architecture	32-bit XT/AT
Memory	From 4 MB to 20 MB on the motherboard Bank 0 4 MB of soldered RAM Bank 1 Sockets for SIMM chips. Installable SIMMs are: **EXM 28-004** 4 MB (1MB x36) SIMMs **EXM 28-008** 8 MB (2MB x 36) SIMMs **EXM 28-016** 16 MB (4MB x 36) SIMMs
Memory access	70 ns
Coprocessor	- 25 MHz i487 SX - 25/50 MHz Overdrive Coprocessor
Floppy DIsk	5.25", 1.2 MB Panasonic JU 475-4 C20R 5.25", 1.2 MB Panasonic JU 475-5 C20R 3.5", 1.44 MB EPSON SMD 1040-418
Hard Disk	40 MB CONNER CP3046F 40 MB QUANTUM Pioneer ELS42 AT 85 MB W.D. Caviar 280 85 MB CONNER CP30084E 85 MB QUANTUM Pioneer ELS85 AT 120 MB QUANTUM Pioneer ELS127 AT 120 MB CONNER CP30126 170 MB CONNER CP30174E 170 MB QUANTUM Pioneer ELS170 AT 170 MB W.D. AC1170 210 MB CONNER CP30256 240 MB CONNER CP30254 240 MB W.D. AC2250-14F 240 MB QUANTUM LPS240 AT
Streaming Tape	120 MB **STU 38-120** with floppy interface SCSI Wangtek 5150ES
Slots	Two 16-bit connectors on the bus expansion board
Video controller	OAK OTI-077, integrated on the motherboard Super V.G.A.
HDU and FDU controller	Integrated on motherboard Floppy disk and hard disk controller: National 87C311
Mouse	AT- and PS/2- compatible
Keyboard	101/102-key ANK 26-101, ANK 26-102

MOTHERBOARD

BA362   4 MB

BIOS

Latest release:
V032004K.25

POWER SUPPLY

Mineba NMB SPE 1095
ALI-LA/11B   110 V
ALI-LA/16B   220 V

Latest level: 01

**BUS EXPANSION
BOARD**

Original

CONSOLE BOARD

Original

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MOTHERBOARD

	LEVEL	D.R.S. CODE	BIOS ROM	NOTES
BA362	Nasc.	553096Q	The BIOS ROM is a FLASH EPROM. The BIOS code is stored on diskettes and has to be copied into Flash EPROM	4 MB soldered on the motherboard.
	Lev. 01			Cuts and wirings to solve parity errors when using 8 MB SIMMs. These kind of parity errors occur only in systems using GOLDSTAR memory chips.

BUS EXPANSION BOARD

	LEVEL	D.R.S. CODE	NOTES
	Nasc.	030099W	The Bus expansion board has: - Two connectors for expansion boards - The CMOS RAM battery
	Lev. 01		-
	Lev. 02		New printed circuit which improves contact between the bus expansion board and system structure.

CONSOLE BOARD

	LEVEL	D.R.S. CODE	NOTES
	Nasc.	030787U	The console board has: - The speaker - Hard disk LED.

MOTHERBOARD INTEGRATED CONTROLLERS

MOTHERBOARD	INTEGRATED CONTROLLERS	
BA362	**i486SX CPU**	25 MHz microprocessor
	Socket for the **i487SX** math coprocessor or for the **Overdirve Coprocessor.**	
	8042	Keyboard and mouse controller
	OAK OTI-077	VGA video controller
	87C311 -	Serial and parallel port controller
		Floppy disk controller
	-	Intelligent hard disk interface
	VL-82C486 -	DMA controller
	-	Interrupt controllet
	-	Timer
	-	System memory controller
	-	System bus controller
	-	Clock generator
	82C113A -	Real Time Clock
	-	128 byte CMOS RAM powered by a lithium battery
	-	Address latch
	IMI SC407BXB	System clock generator
	1 MB Flash EPROM	

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BOARDS

FUNCTION	DESCRIPTION	D.R.S. CODE	CHARACTERISTICS
CPU board	BA362	553096Q	4 MB
220 V power supply	ALI-LA/11B	150542B	
110 V power supply	ALI-LA/16B	150543C	
Bus adapter board		030099W	
Console board		030787U	

USER DISKETTE

LEVEL	COMPATIBILITY
Rel. 1.02	-
Rel 1.03	User diskette in five languages. All problems regarding the CPU and mouse tests have been solved.

SYSTEM TEST

LEVEL	COMPATIBILITY
Rel. 1.0	System test for the PCS44
Rel. 1.03	System test for the M300-28

POWER SUPPLY

POWER SUPPLY	LEVEL	DESCRIPTION
ALI-LA/11B 110 V	Nasc.	
	Lev. 01	Modifications to the metal cover.
ALI-LA/16B 220 V	Nasc.	
	Lev. 01	Modifications to the metal cover.

NOTES ON COMPATIBILITY

BOARD OR HW/SW DEVICE	DESCRIPTION
-	-

SOFTWARE DRIVER

DRIVER	NOTES
EVD driver Rev. 1.02	Driver for the OAK OTI 077 video controller

BIOS

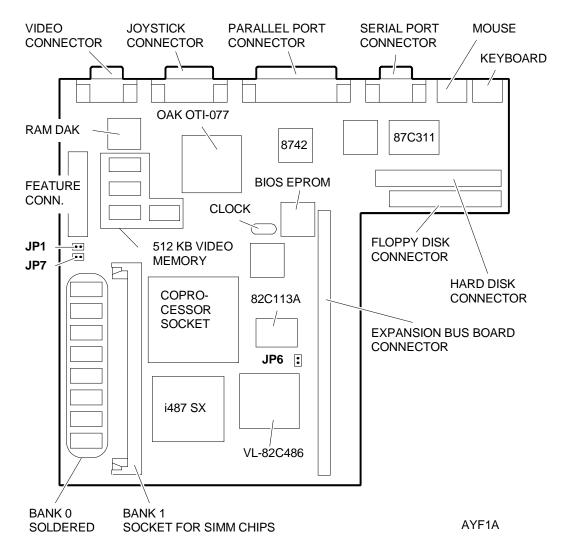| LEVEL	NOTES
V032004**b** 25	
V032004**e** 25	
V032004**g**.25	This BIOS version solves the problem concerning the incorrect compilation of the BIOS data area as far as the addresses of any serial or parallel board installed on the AT bus are concerned.
V032004**k** 25	This BIOS version solves the problem of the Security utilities not accepting numeric characters.

SOFTWARE COMPATIBILITY

OPERATING SYSTEMS	NOTES
MS-DOS Release 5.0 OS/2 Release 2.0 OS/2 Release 1.3 SE SCO UNIX System V Version 3.2.4 WINDOWS Ver. 3.1	

HARDWARE COMPATIBILITY

MODEMS	I/O INTERFACE PRODUCTS
Hayes Smart modem 2400 Hayes Smart modem 2400B Hayes Smart modem 9600 B Motorolla UDS Ext. Modem Internal Modem 2400B	Serial/parallel adapter Printer adapter
MULTIPORT	**MOUSE**
Multiport I/O Card Digi Board com/8 Megaport 8CS Intelliport II	IBM PS/2 Mouse IBM PS/2 Serial Mouse Serial Mouse BUS Mouse
GRAPHICS PRODUCTS	**NETWORKING & LAN PRODUCTS**
Graphics Adapter ISA BUS Graphics Station Adapter Graphics Adapter VGA1024 Graphics Adapter 1024/i VGA BUS EGA autoswitch	NOVELL NE2000 adapter ARCNET PC600 adapter ISA 16/4 Token Ring Adapter
MONITORS	
IBM 8503 Monitor IBM 8514 Monitor NEC 3D Monitor	Multisync 3D monitor

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MOTHERBOARD COMPONENTS AND JUMPERS

VIDEO CONNECTOR   JOYSTICK CONNECTOR   PARALLEL PORT CONNECTOR   SERIAL PORT CONNECTOR   MOUSE

KEYBOARD

OAK OTI-077

RAM DAK

87C311

8742

FEATURE CONN.

BIOS EPROM

CLOCK

JP1

JP7

512 KB VIDEO MEMORY

FLOPPY DISK CONNECTOR

HARD DISK CONNECTOR

COPRO-CESSOR SOCKET

82C113A

JP6

EXPANSION BUS BOARD CONNECTOR

i487 SX

VL-82C486

BANK 0 SOLDERED   BANK 1 SOCKET FOR SIMM CHIPS

AYF1A

JUMPER JP1
Not installed   i486 SX processor soldered. Default setting.
Installed   i486 DX or i486 DX2 coprocessor soldered (not available on the M300-28/PCS44).
NOTE: If the i487SX or the Overdrive Coprocessor is installed in the coprocessor socket,
                 there is no need to set this jumper since the system will automaticallydetect
                 that one of these coprocessors are present.
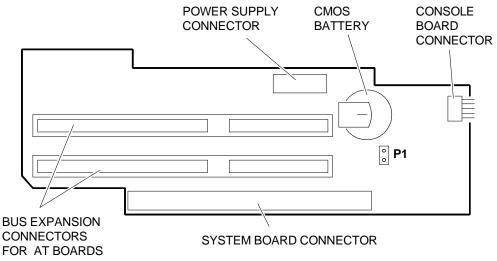
JUMPER JP6
Not installed   Normal operation. This is the default setting.
Installed   The contents of the CMOS are cancelled and therefore system SETUP is lost.

JUMPER JP7
Not installed   Normal operation. This is the default setting.
Installed   The password is cancelled.
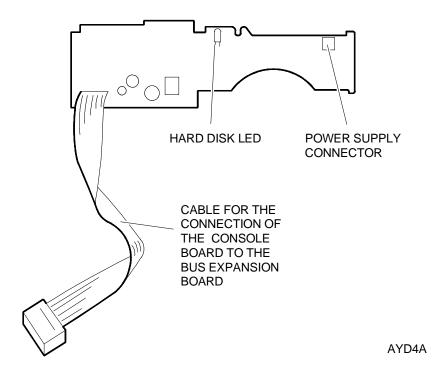
BUS EXPANSION BOARD COMPONENTS AND JUMPERS

AYD3A

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JUMPER P1 (CMOS battery)
This jumper must be installed when the system is powered on.

CONSOLE BOARD CONNECTORS

AYD4A

BUILT IN SETUP

During the Power On Diagnostics, the following message is displayed after checkpoint 2ch:

"PRESS CTRL-ALT- ESC for SETUP"

From now until the moment the BIOS begins the system bootstrapping sequence, you will have the possibility of accessing the system SETUP facility. When SETUP is requested, the software reads the contents of CMOS RAM. If the CMOS is altered, default values will be used.

If, when exiting SETUP, you decide to save the modifications made, the program will copy the new configuration into CMOS and calculate the new checksum.

The SETUP utility consists of four screens that directly interface the system BIOS, and is displayed in English only.

The first screen is only informative. The information collected during the first part of the POD is displayed on the left-hand side of this screen, while **the different icons that give access to the other screens are displayed on the right-hand side.**

The SETUP utility has usual interface with pop-up menus. The following function keys can be used: **arrow** keys, the **<ENTER>** key, the **F2** key to switch from between a color and monochrome interface, the **F10** or **<ESC>** key to move upwards from one screen to another until reaching the very first menu screen with the EXIT icon.

SYSTEM CONFIGURATION

This is the first screen of the SETUP utility; the values that appear in the individual fields are specific for each machine configuration. The icons that give access to the different screens are displayed on the right-hand side of the screen:

Setup Version Number:	1.01	<---Setup program version
BIOS Version Number:	v3.20.03	<--- BIOS version
BIOS Date Stamp:	09/08/92	<--- Latest BIOS update*
Processor:	486SX	<--- Type of processor installed
Processor Speed:	25MHz	<--- System clock
System Base Memory:	640	<--- Basic memory
System Extended Memory:	3072	<--- Extended memory

* This update could have been the last time a BIOS EPROM Flash was performed or when the configuration was last changed.

1st MENU - SYSTEM SETUP

This is the first menu of the SETUP utility. A help window is displayed on the right-hand side of the screen. Each time you select a SETUP parameter, this window will display the meaning of this parameter and how to use it.

System Date: Allows you to enter or change the system date according to the following format: mm/dd/yy.

System Time: Allows you to enter or change the system time.

Floppy diskette 1:
Floppy diskette 2: Allows you to define the type of floppy disk drive installed in the system. Drive 1 is the default drive. The following drives can be defined: NONE, 360K, 1.2M, 720K, 1.4M.

Disk: Indicates the hard disk drive installed. The BIOS supports two hard disks, but the installation of a second hard disk is **not** expected.

Video: Allows you to select the type of monitor connected to the system. The following can be defined: Mono, EGA/VGA, Color 40, Color 80.

Mouse Port: Allows you to enable or disable the mouse port. If Enabled is defined but the mouse port is not detected, this parameter will automatically change to Disabled.

Processor Speed: Allows you to set the processor speed so that the system becomes compatible with the previous generation of slower microprocessors. The values that can be defined are Fast and Slow.

Video VDU Refresh Rate: Allows you to select the video refresh rate. The following values can be defined: 60 Hz and 72 Hz.

Hard Disk Table

The hard disk table is an area of the BIOS that stores operating characteristics of a rappresentative group of hard disk drives. The information does not refer to a specific manufacturer but to the characteristics of the standard drives available.

Each table entry is identified by a specific type, and there are 47 predefined types of drives listed. The last two types, 48 and 49, can provide the values obtained by the self-acknowledge feature of the first or second (not expected) hard disk drive installed in the system.

WARNING: Since the BIOS supports the hard disk self-acknowledge feature, the Disk parameter is usually configured automatically. This is because the intelligent hard disk drive (IDE interface) provides its own configuration parameters (Capacity, Cylinders, Heads, Sectors, Precompensation and Head Landing Zone) to the BIOS. The self-configured disk is identified as Type 48.

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DISK	TYPE	CYLS	HDS	SEC	PRE	ZONE
10M	1	306	4	17	128	305
20M	2	615	4	17	300	615
30M	3	615	6	17	300	615
62M	4	940	8	17	512	940
46M	5	940	6	17	512	940
20M	6	615	4	17	NONE	615
30M	7	462	8	17	256	511
30M	8	733	5	17	NONE	733
112M	9	900	15	17	NONE	901
20M	10	820	3	17	NONE	820
35M	11	855	5	17	NONE	855
49M	12	855	7	17	NONE	855
20M	13	306	8	17	128	319
42M	14	733	7	17	NONE	733
	15	RESERVED				
20M	16	612	4	17	0	663
40M	17	977	5	17	300	977
56M	18	977	7	17	NONE	977
59M	19	1024	7	17	512	1023
30M	20	733	5	17	300	732

DISK	TYPE	CYLS	HDS	SEC	PRE	ZONE
42M	21	733	7	17	300	732
30M	22	733	5	17	300	733
10M	23	306	4	17	0	336
40M	24	977	5	17	NONE	976
76M	25	1024	9	17	NONE	1023
71M	26	1224	7	17	NONE	1223
111M	27	1224	11	17	NONE	1223
152M	28	1224	15	17	NONE	1223
68M	29	1024	8	17	NONE	1023
93M	30	1024	11	17	NONE	1023
83M	31	918	11	17	NONE	1023
69M	32	925	9	17	NONE	926
85M	33	1024	10	17	NONE	1023
102M	34	1024	12	17	NONE	1023
110M	35	1024	13	17	NONE	1023
119M	36	1024	14	17	NONE	1023
17M	37	1024	2	17	NONE	1023
136M	38	1024	16	17	NONE	1023
114M	39	918	15	17	NONE	1023
40M	40	820	6	17	NONE	820
42M	41	1024	5	17	NONE	1023
65M	42	1024	5	26	NONE	1023
40M	43	809	6	17	NONE	852
61M	44	809	6	26	NONE	852
100M	45	776	8	33	NONE	775
203M	46	684	16	38	NONE	685
30M	47	615	6	17	NONE	615
	48	MANUAL OR SELF-ACKNOWLEDGED DEFINITION				
	49	MANUAL OR SELF-ACKNOWLEDGED DEFINITION				

Autoconfiguration during the system bootstrap phase

If the data in CMOS regarding the configuration of the hard disk are lost, or if a new hard
disk is installed in the system, the following question will be displayed at the end of the POD, at the
bottom of the screen:

<p align="center">Auto Config IDE Controller (Y/N)?</p>

If you answer Y, the hard disk will pass its own parameters over to the BIOS. The following
message is displayed at the end of the autoconfiguration phase:

<p align="center">IDE Drive succesfully configured, press any key...</p>

Autoconfiguration from BUILT IN SETUP

Select the Disk field from the System SETUP menu, and then select the **AUTO** option. After
confirming this option, the messages indicated in the previous section will be displayed.

2nd MENU - EXTENDED SETUP

This is the second SETUP menu. It allows you configure the system at an advanced level. An
explanation of the parameter selected is displayed on the right-hand side of the screen.

Primary Cache Controller: Allows you to copy the BIOS code into system RAM. The two values
that can be defined are Enable/Disable.

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Shadow RAM: Allows you to store the video and system BIOS in Shadow RAM..
The following values can be defined: Disable, System,
Video, System & Video. System & Video is the default configuration.

BIOS Cacheability: Allows you to store the video and system BIOS in cache memory.
The values that can be defined are the same as those for Shadow RAM..

Flash BIOS Eprom Enable: Enables the setting of the Flash BIOS procedures.
Disabled is the default configuration.

WARNING: In order to change the value in this field, switch the system off and then
on again. A software reset (CTRL+ALT+DEL) is not enough.

Speaker Volume: Allows you to set the speaker volume.
The allowed values are: OFF, 1/7, 2/7, 3/7, 4/7, 5/7, 6/7, FULL.

Power On Keyboard Test: Allows you to enable/disable the keyboard.
The allowed values are: ON, OFF.

Base Memory Size: Allows you to select the size of basic memory. The allowed values
are: 640K, 512K.

C800 Segment Shadow
D000 Segment Shadow
D800 Segment Shadow
E000 Segment Shadow
E800 Segment Shadow: Allow you shadow, shadow & cache, or disable certain 32K
memory segments. If an optional board with its own ROM is installed
in the system and this board's address is known, you can shadow &
cache this ROM at one of the addresses enabled by this parameter.

INT 15 Memory Report: Used to ensure compatibility with certain operating systems. The
allowed values are ALL and 16 MB. ALL indicates that int 15 h shows
all the system RAM installed, even if greater than 16 MB.
16 MB indicates that int 15 h shows a maximum 16 MB configuration.

ISA Memory Caching: Allows you to disable memory cache at 1 MB intervals. The allowed values are All Enable, 16M Disable, 15-16M Disable, 14-16M Disable, 13-16M Disable.

3rd MENU - SYSTEM SECURITY

This is the third SETUP menu. It allows you to set the system's security features.

System Security: Allows you to set the different security levels. The allowed values are:

        Disable: No security is enabled.

        Boot: A password is requested the moment the system is bootstrapped.

        Quicklock: Allows you to disable/enable the keyboard through a CTRL-ALT-x sequence, where x is a user-selected secret letter.

        Quicklock & Boot: Enables the Quicklock feature and requests a password the moment the system is bootstrapped.

System Security Password: Allows you to define a system security password at the security level defined in the previous parameter. If the System Security parameter is set to Disabled, the password defined in this field is automatically erased.

Quick Lock Key: Allows you to define the letter to associate with the CTRL-ALT sequence to enable the keyboard protection feature. This field can only be modified if the System Security field is correctly set (Quicklock or Quicklock & Boot).

Setup Security: Allows you to protect the BUILT IN SETUP. The allowed values are: Enable/Disable.

Setup Password: Allows you to define the BUILT IN SETUP password.

4th MENU - EXIT

Select this icon to exit BUILT IN SETUP. You will be asked to confirm this choice and to save any modification made to the system's **basic configuration**.

I/O ADDRESS MAP

ADDRESS	FUNCTION	ADDRESS	FUNCTION
0-0F	DMA controller #1	FB	Chipset configuration register enable
20-21	Interrupt controller #1	0C0-0DF	DMA controller #2
40-43	Timer counter	1F0-1F7	IDE hard disk register
60, 64	Keyboard controller	201	Game port
61	Port B	278-27F	Alternative LPT2 parallel port
70	RTC index/NMI enable register	2B0-2BF	EGA video
71	RTC data register	2C0-2CF	EGA video
80-8F	DMA page registers	2D0-2DF	EGA video
90	Custom I/O port #1	2E8-2EF	Alternative COM4 allocation for serial port B
91	Custom I/O port #2	2F8-2FF	Primary COM2 allocation for serial port B
92	PS/2-compatible FAST GATE_A20 and FAST RESET	378-37F	Primary LPT1 parallel port
94	System setup register OTI-077	398-399	National PC82311 configuration ports
102	System setup register OTI-077	3B0-3BB	MDA video
A0-A1	Interrupt controller#2	3B4/3D4	VGA video
EC-ED	82C486 chipset configuration ports	3B5/3D5	VGA video
EE	FAST A20 (alternative)	3BA/3DA	VGA video
EF	FAST CPU reset port (alternative)	3C0-3CF	EGA/VGA video
F0	Coprocessor busy register	3D0-3DF	CGA video
F1	Coprocessor reset register	3F0-3F7	Floppy disk drive allocation
F4	Slow CPU register	3E8-3EF	Alternative COM3 allocation for serial port A
F5	Fast CPU register	3F8-3FF	Primary COM1 allocation for serial port A
F9	Chipset configuration register disable		

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INTERRUPT LEVELS

INTERRUPT	FUNCTION
IRQ1	Counter timer
IRQ2	Second interrupt controller cascade input
IRQ3	COM2 interrupt
IRQ4	COM1 interrupt
IRQ5	LPT1
IRQ6	Floppy disk drive
IRQ7	LPT2
IRQ8	Real Time Clock
IRQ9	Not used
IRQ10	Not used
IRQ11	Not used
IRQ12	Mouse
IRQ13	Numeric coprocessor
IRQ14	IDE drive controller
IRQ15	Not used

DMA CHANNELS

CHANNEL	FUNCTION
Channel 0	Not used
Channel 1	Not used
Channel 2	Floppy disk drive
Channel 3	Not used
Channel 4	Cascade
Channel 5	Not used
Channel 6	Not used
Channel 7	Not used

MEMORY MAP

ADDRESS	FUNCTION
00000-7FFFF	512K of system memory
80000-9FFFF	128K of system memory/optional ISA mapping
A0000-BFFF	Graphics and text memory (on system board)
C0000-CFFFF	Video BIOS
D0000-DFFFF	Extended ROM BIOS/expansion for I/O channels
E0000-EFFFF	Video BIOS
F0000-FFFFF	System BIOS
100000-3FFFFF	4 MB of system DRAM
400000-13FFFFF	20 MB expansion SIMMs
1400000-FFFEFFFF	Local bus (not used on system board)
FFFF0000-FFFFFFFF	System BIOS Shadow

The entire DRAM area can be cached.

Pre-installed software on the PCS44

The PCS44 personal computer is configured at the factory with a basic software platform and an application. The following table shows how this platform is composed and indicates the function of each software.

SOFTWARE	FUNCTION
Welcome	This program is used to customize the system. It must be launched after the POD when the system is powered-on for the **very first time**. **WARNING:** This program can be launched only once. You can, however, make a back-up copy of the program once it has been installed. With this program, you can: - Define the type of keyboard used and the national language version - Choose, install and configure the software platform - Install the **MS-DOS 5.0** operating system. Make a back-up copy of this operating system - Install **Windows 3.1** - Install **Antivirus Norton** - Install **DoubleDisk** - Run the **Tutorial** - Install the **Enhanced Video Drivers**
MS-DOS 5.0	Operating system
Windows 3.1	Graphics environment
Norton Antivirus	Antivirus utility.
DoubleDisk	Hard disk data compression utility. Virtually extends the capacity of the hard disk.
Tutorial	Gives technical information on the system, hardware modules and software.

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After installing the software platform, a file system as the one shown in the following table should be present on the hard disk.

C:\	AUTOEXEC.BAT, CONFIG.SYS, COMMAND.COM
C:\DOS	National version of the MS-DOS operting system
C:\WINDOWS	National version of Windows
C:\DOSHELP	National version of Doshelp
C:\NAV	National version of Norton's Antivirus program
C:\DUBLDISK	DoubleDisk data compression program
C:\MANUALS	USER-MAN, files from the User's Guide NAV-MAN, files from the Norton Antivirus manual DD-MAN, files from the DoubleDisk manual
C:\TUTORIAL	Tutorial program files
C:\CUSTOMER	Diagnostic test and mouse driver files

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