Server

Systembaugruppe D992
System board D992

Technisches Handbuch
Technical Manual

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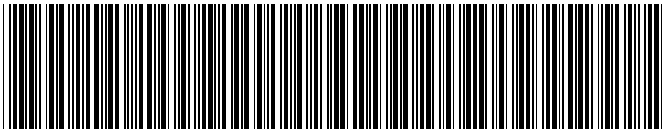
Herausgegeben von/Published by
Siemens AG
D-81730 München

Bestell-Nr./Order No.: ***A26361-D992-Z121-1-7419***
Printed in the Federal Republic of Germany
AG 0798 07/98



A26361-D992-Z121-1-7419

Deutsch

English

Systembaugruppe D992
System board D992

Technisches Handbuch
Technical Manual

Ausgabe Juli 1998
July 1998 edition

Contents

Introduction

This description applies for the system board D992 with PCI bus (Peripheral Component Interconnect).
System board D992 is available in two variants: as a monoprocessor system (D992-Mono) and as a dual-processor system (D992-Dual). This manual applies for both variants. Explicit reference is made to any differences.
You may find further information in the description "BIOS Setup".
Further information to drivers is provided in the readme files on hard disk or on the supplied drivers diskettes or on the "Drivers & Utility" or "ServerStart" CD.

Notational conventions

The meanings of the symbols and fonts used in this manual are as follows:

Pay particular attention to texts marked with this symbol. Failure to observe this warning endangers your life, destroys the system, or may lead to loss of data.

This symbol is followed by supplementary information, remarks and tips.

► Texts which follow this symbol describe activities that must be performed in the order shown.
␣ This symbol means that you must enter a blank space at this point.
↵ This symbol means that you must press the Enter key.
`Texts in this typeface` are screen outputs from the PC.
`Texts in this bold typeface` are the entries you make via the keyboard.
Texts in italics indicate commands or menu item.
"Quotation marks" indicate names of chapters and terms that are being emphasized.

Important notes

Store this technical manual close to the device. If you pass on the device to third parties, you should also pass on this manual.

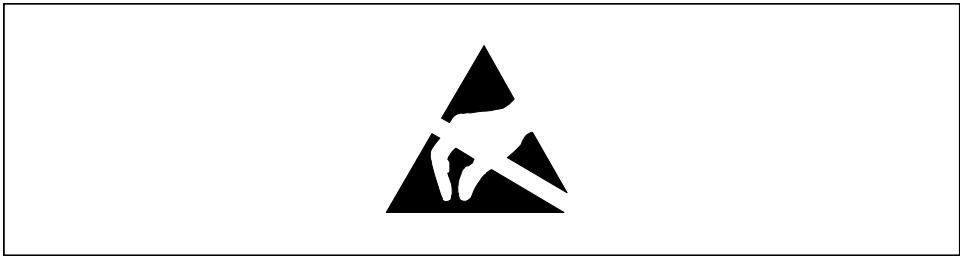
Be sure to read this page carefully and note the information before you open the system.
Please note the information provided in the chapter "Safety" in the Operating Manual of the system.
Incorrect replacement of the lithium battery may lead to a risk of explosion. It is therefore essential to observe the instructions in the chapter „Replacing the lithium battery".
The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).
Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

Connecting cable for peripherals must be adequately insulated to avoid interference.

Modules can become very hot during operation. Make sure you do not touch modules when adding components to the system board. There is a danger of burns!

The warranty expires if the device is damaged during the installation or replacement of system expansions. Information on which system expansions you can use is available from your sales office or the customer service.

Boards with electrostatic sensitive devices (ESD) may be identified by labels.



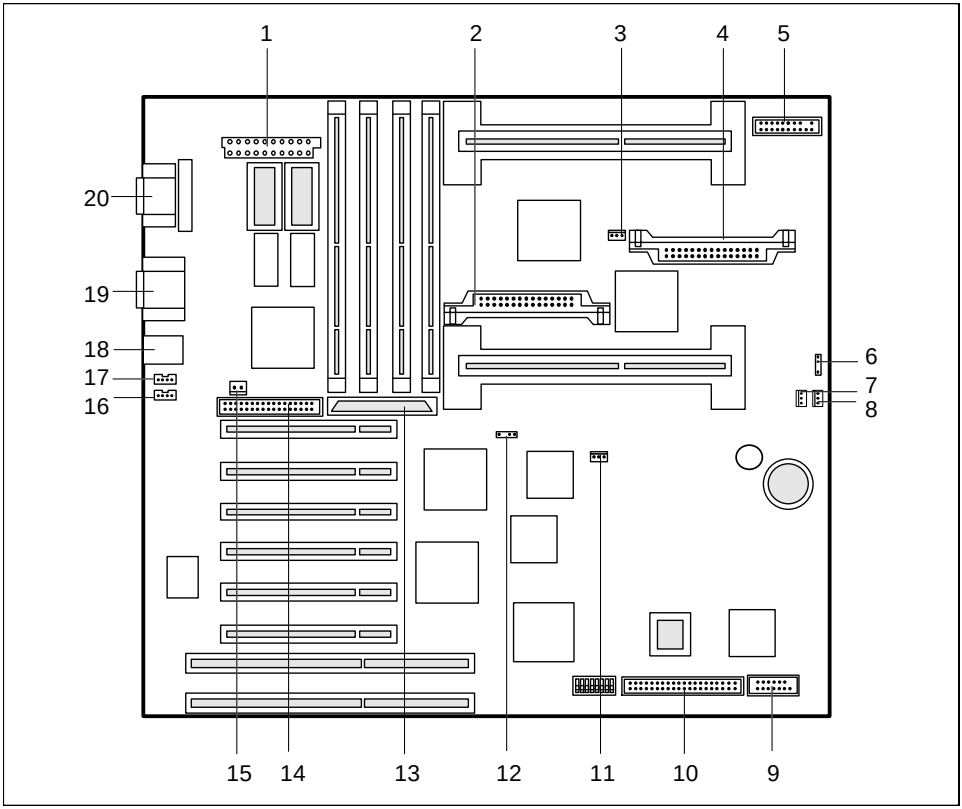
When you handle boards fitted with ESDs, you must observe the following points under all circumstances:

- You must always discharge yourself (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Pull out the power plug before inserting or pulling out boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Features

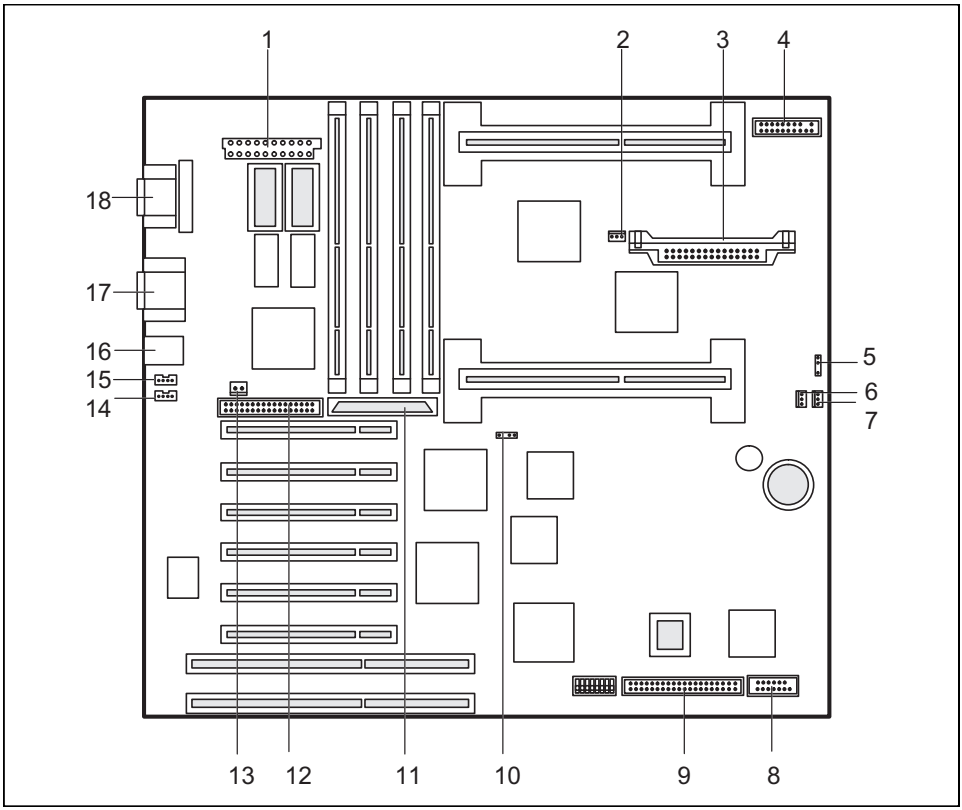
- Mono processor system (D992 mono) or
  Dual processor system (D992 dual: second processor optional)
- Processor: Pentium II, 233 (only D992 mono), 266, 300 and 333 MHz with 66 MHz bus frequency, with integrated 16 Kbyte first-level cache and 512 Kbyte second-level cache
- Only D992 dual: Upgrade with second Pentium II processor in slot 2
- Voltage regulators which sets themselves automatically to the required voltage range (1.5 V to 3.5 V)
- Intel 82440FX chipset with ISA bridge
- 72-bit data bus (64-bit data and 8-bit ECC)
- 64 Mbyte to 512 Mbyte main memory for buffered DIM modules, ECC protected (4 banks), 1 Gbyte main memory with 333-MHz processor and extended cacheability
- 4 Mbit Flash BIOS
- 6 PCI slots, 2 ISA slots (1 slot shared)
- Screen controller connected to PCI bus, graphics processor Cirrus Logic CL-GD5446, 1 Mbyte DRAM video memory, 2 Mbyte optional
- Ultra-Wide SCSI controller AIC 7880P
- SNI-ASIC for Server Management
- IDE hard disk controller connected to PCI bus for two IDE drives
- Real-time clock/calendar with integrated battery backup
- Floppy disk controller (up to 2.88 Mbytes format)
- Connector for loudspeaker, two fans, remote-On/Off, wide SCSI drive, floppy disk drive, IDE disk drive, control panel and service, temperature sensor
- Monitor port
- Parallel interface (ECP- and EPP-compatible)
- Two serial ports (compatible 16550, 16-Byte-FIFO)
- PS/2 mouse port, PS/2 keyboard port
- CAN bus interface for control of external drive cabinets
  (CAN = Controller Area Network)
- Security functions in BIOS
- Server management support

Ports and connectors: D992 dual



1 = Power supply 5V and ± 12V
2 = Voltage converter for processor 1
3 = Temperature sensor for processor 2
4 = Voltage converter for processor 2
5 = Control panel 1
6 = Loudspeaker
7 = Fan 2
8 = Fan 1
9 = Server management support
10 = IDE drives
11 = Temperature sensor for processor 1
12 = SCSI indicator
13 = Ultra wide SCSI drives
14 = Diskette drives
15 = Modem On
16 = CAN bus controller 1
17 = CAN bus controller 2
18 = Keyboard and mouse
19 = Serial port 1 and 2
20 = Parallel port and monitor port

Ports and connectors: D992 mono



1 = Power supply 5V and ± 12V
2 = Temperature sensor for processor
3 = Voltage converter for processor
4 = Control panel 1
5 = Loudspeaker
6 = Fan 2
7 = Fan 1
8 = Server management support
9 = IDE drives
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11 = Ultra wide SCSI drives
12 = Diskette drives
13 = Modem On
14 = CAN bus controller 1
15 = CAN bus controller 2
16 = Keyboard and mouse
17 = Serial port 1 and 2
18 = Parallel port and monitor port

Possible screen resolution

Depending on the operating system used the screen resolutions in the following table refer to the screen controller on the system board for 1 Mbyte video memory.
If you are using an external screen controller, you will find details of supported screen resolutions in the Operating Manual or Technical Manual supplied with the controller.

Screen resolution	Refresh rate (Hz)	Horizontal-rate (kHz) **	Max. number of colors
640x350	70	31,5	16
640x480	60	31,5	16777216
640x480	75	37,5	16777216
640x480	85	43,4	16777216
640x480	100	50,6	16777216
720x400	70	31,5	16
720x400	84	38	16
800x600	60	38	65536
800x600	72	48	65536
800x600	75	47	65536
800x600	85	53,7	65536
800x600	100	63	65536
1024x768	60	48,4	256
1024x768	75	60	256
1024x768	85	68,7	256 *
1024x768	87 interlaced	36	256
1024x768	100	81	256 *
1280x1024	87 interlaced	49	16

* no 16 color mode
** The horizontal rate values may have a tolerance range of ± 0.3 kHz.

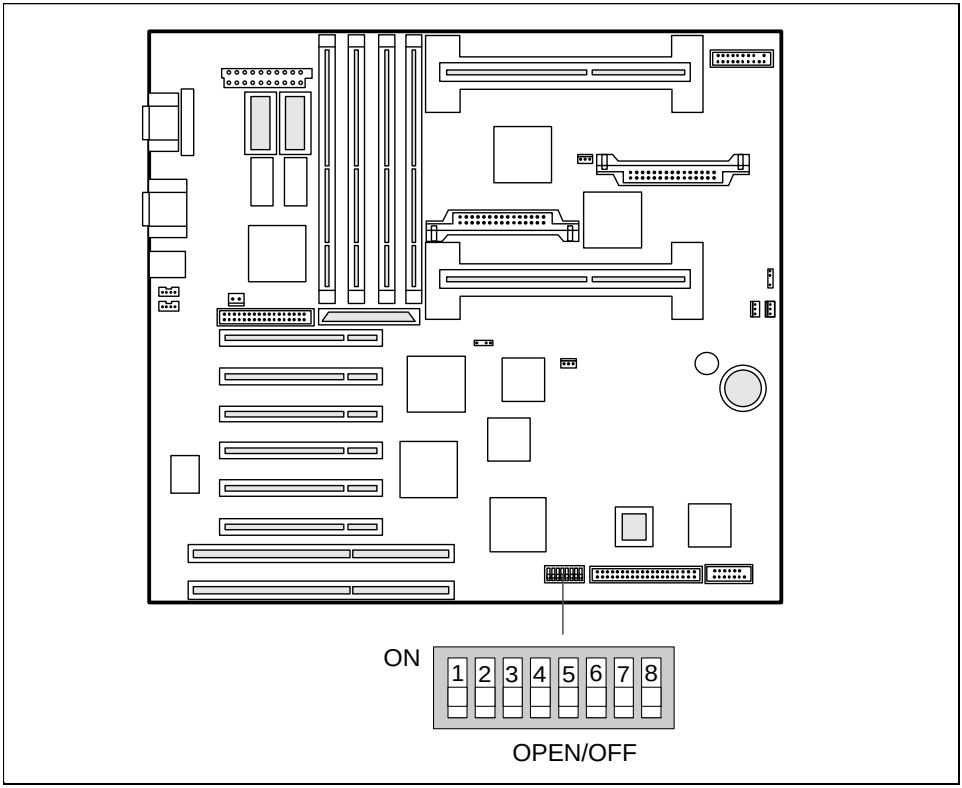
Interrupt table

	assigned IRQ
System clock	IRQ0
Keyboard	IRQ1
not available	IRQ2
Serial port COM 2	IRQ3
Serial interface COM1	IRQ4
free	IRQ5
Floppy disk drive controller	IRQ6
Parallel interface LPT1	IRQ7
Real-time clock (RTC)	IRQ8
free	IRQ9
free	IRQ10
free	IRQ11
Mouse controller	IRQ12
Numeric processor	IRQ13
IDE controller/free	IRQ14
free	IRQ15

"assigned IRQ" = interrupts assigned as shipped

i Note that an interrupt cannot be used by two ISA boards or onboard controllers at the same time.
The screen controller of the system board does not require interrupt IRQ9. If you are using a different screen controller, it may need interrupt IRQ9.

Settings on the system board



Switch 1 = System BIOS recovery
Switch 2 = must be set to *off*
Switch 3 = Write-protection for system BIOS
Switch 4 = write protection for floppy disk drive
Switch 5, 6, 7, 8 = clock speed

i The switch settings apply both to the dual-processor system and to the monoprocessor system.

Recovering System BIOS - switch 1

Switch 1 enables recovery of the old system BIOS after an attempt to update has failed. To restore the old BIOS you need a Flash BIOS Diskette (call customer service). The existing BIOS settings are meaningless for restoring the system BIOS (e.g. the *Security* menu in the *Flash Write* field).

OFF The System BIOS is started with the system BIOS from the system board (default setting).

ON The system is started from the Flash BIOS Diskette in drive A. A recovery of the system BIOS is executed.

If switch 1 is set to *ON*, switch 3 must be set to *OFF (OPEN)*.

Write protection for System BIOS - switch 3

Switch 3 enables and disables system BIOS updating. Before an update of the system BIOS can be carried out, write protection for the system BIOS must also be disabled in the *BIOS Setup* (in the *Security menu*, the *Flash Write* field must be set to *Enabled*). If you wish to update your system BIOS, please consult our customer service.

OFF System BIOS can be overwritten (default setting).

ON System BIOS is write protected.

Write protection for floppy disk drive - switch 4

Switch 4 is used to define whether floppy disks can be written or deleted in the floppy disk drive. To write and delete floppy disks, the write protection in *BIOS setup* must be disabled (in menu *Security*, the field *Diskette Write* must be set to *Enabled*).

OFF Read, write and delete floppy disks is possible (default setting).

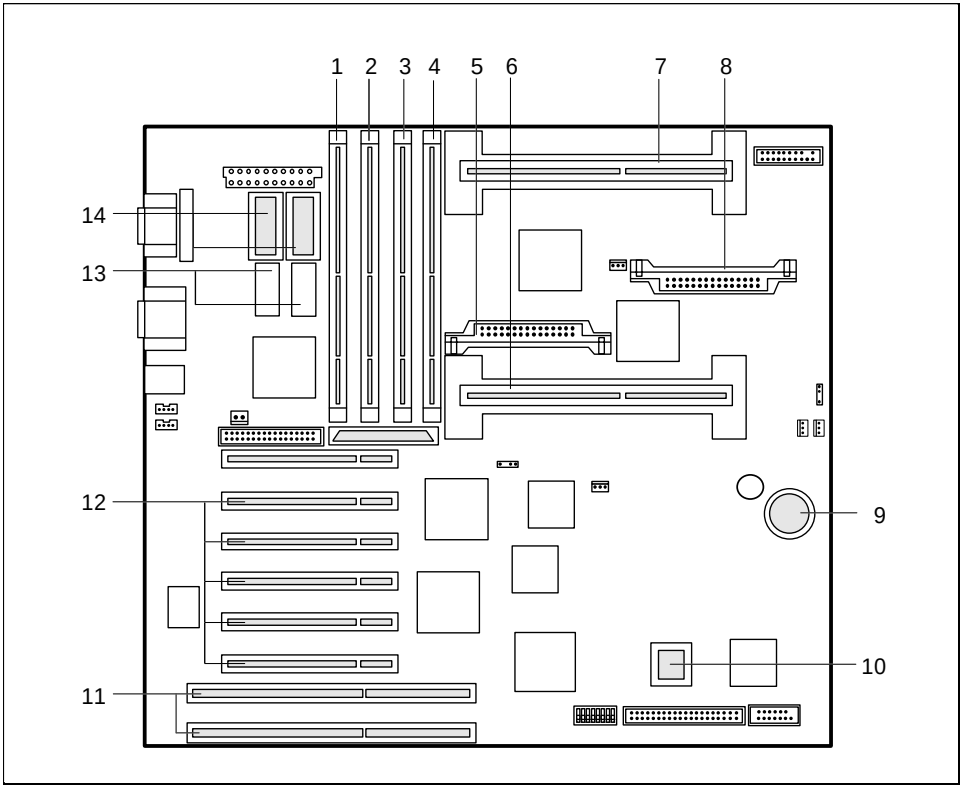
ON The floppy disk drive is write-protected.

Clock speed - switch 5, 6, 7 and 8

The switch may only be set as specified in the table below for the particular processors used.

processor	switch 5	switch 6	switch 7	switch 8
233 MHz	on	off	off	on
266 MHz	on	on	on	off
300 MHz	on	off	on	off
333 MHz	on	on	off	off

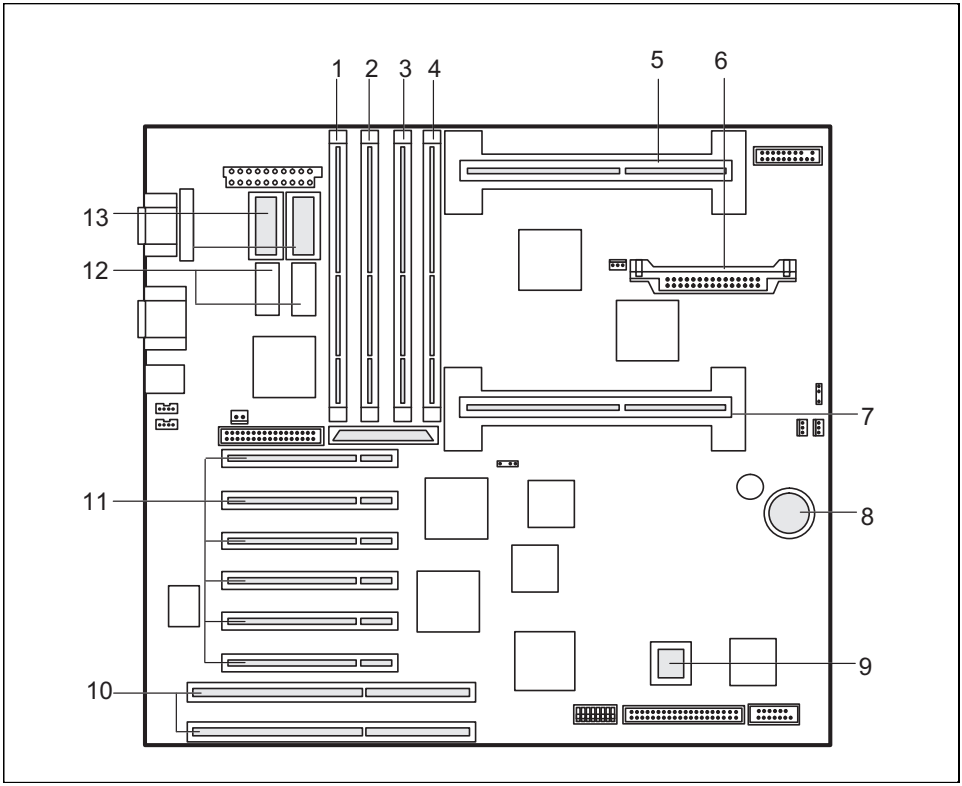
Extensions: D992 dual



1 = Main memory bank 3
2 = Main memory bank 2
3 = Main memory bank 1
4 = Main memory bank 0
5 = Voltage converter for processor 1
6 = First processor
7 = Second processor (optional)
8 = Voltage converter for processor 2
9 = Lithium battery
10 = Flash BIOS
11 = ISA slots - from below: 1 and 2
12 = PCI slots (from below: 2, 3, 4, 5, 6, 7)
13 = Video memory 1 Mbyte (optional)
14 = Video memory 1 Mbyte

i PCI slots 2, 3 and 4 are connected to the primary PCI bus. PCI slots 5, 6 and 7 are connected to the secondary PCI bus.
PCI slot 7 is only for short boards.

Extensions: D992 mono



1 = Main memory bank 3
2 = Main memory bank 2
3 = Main memory bank 1
4 = Main memory bank 0
5 = Processor
6 = Voltage converter for processor
7 = Terminating board
8 = Lithium battery
9 = Flash BIOS
10 = ISA slots - from below: 1 and 2
11 = PCI slots (from below: 2, 3, 4, 5, 6, 7)
12 = Video memory 1 Mbyte (optional)
13 = Video memory 1 Mbyte

i PCI slots 2, 3 and 4 are connected to the primary PCI bus. PCI slots 5, 6 and 7 are connected to the secondary PCI bus.
PCI slot 7 is only for short boards.

Upgrading main memory

The system board incorporates four locations for installing memory modules in DIMM format (bank 0 to bank 3). The board supports a maximum of 512 Mbytes. On 333-MHz processors with extended cache ability only, the maximum memory capacity is 1 Gbyte. You may use EDO DRAM memory modules of 64, 128 or 256 Mbytes.
Equipping must be performed starting with bank 0 in sequence.
EDO-DRAM = Enhanced Data Output Dynamic Random Access Memory

You may only use buffered 3.3V memory modules. Unbuffered memory modules are not permitted.
EDO-DRAM memory modules must have an access time of 60 ns or less.

Installing memory modules

- ► Flip the holders on each side of the relevant location outwards.
- ► Insert the memory module into the location.
- ► At the same time flip the lateral holders upwards until the memory module snaps in place.

Removing a memory module

- ► Flip the holders to the right and left of the location outwards.
- ► Pull the memory module out of its location.

Replacing the Pentium II

System board D992 dual
The system board can be upgraded with a second Pentium II processor in slot 2. You can replace the Pentium II processor in slot 1.
If the system board contains only one processor in slot 1, a terminating board must be inserted in slot 2 and there is no voltage converter for processor 2 inserted.

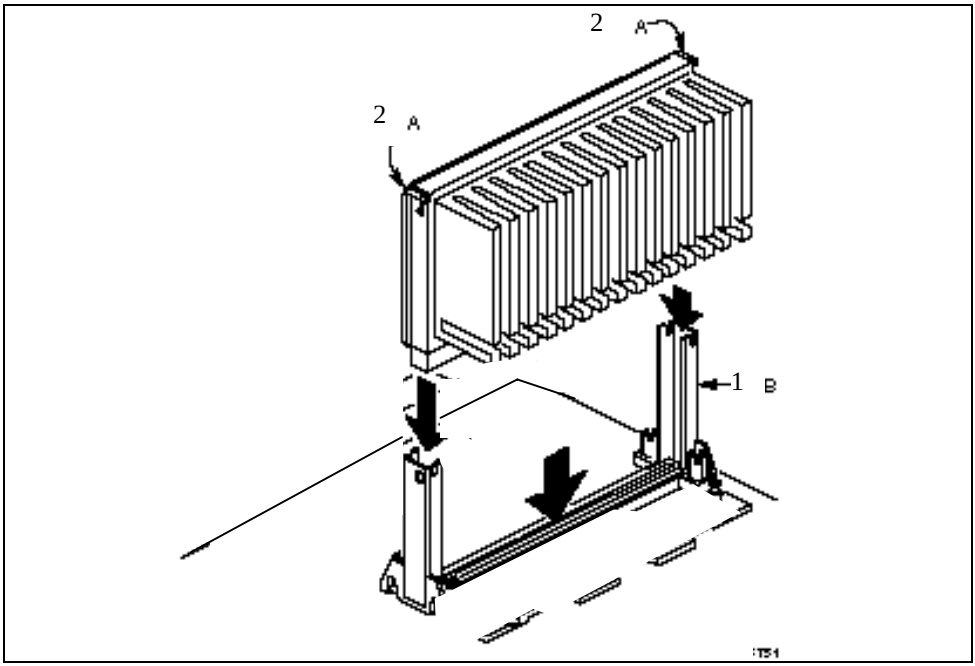
The second Pentium II processor must have the same clock rate as the first. A suitable multiprocessor operating system must be used if dual operation is required. On the processor modules you may use only processors of the same type.

System board D992 mono
The system board can only be operated with a Pentium II processor in slot 2. There is a terminating board in slot 1. Voltage converter slot 1 is empty.

Removing the Pentium II

- ► If the Pentium II has a temperature sensor, pull out the associated cable.
- ► Press the clamps (2) on either side of the Pentium II inwards and pull the Pentium II up and out.
- ► Insert the terminating board into the slot if necessary.

Installing the Pentium II

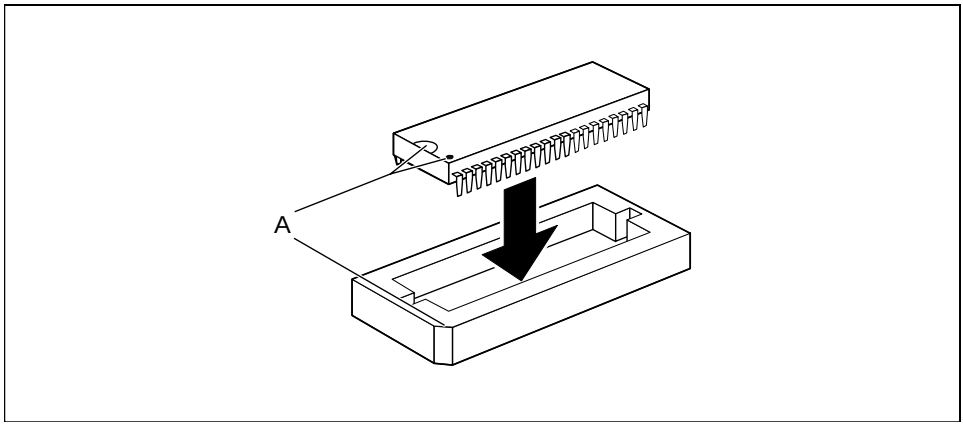


- ► Remove the terminating board if necessary.
- ► Place the Pentium II in the holder (B).
- ► Push the Pentium II down in the holder and press it into the slot until the clamps (A) to the left and right snap into place.
- ► Set the clock frequency of the new Pentium II using switches 5 to 8 of the switch block.
- ► If the Pentium II has a temperature sensor, attach the associated cable to the connector for the temperature sensor on the system board.

Upgrading the video memory

If your system board is supplied with a video memory configuration of 1 Mbyte, you may enlarge the video memory up to 2 Mbytes.

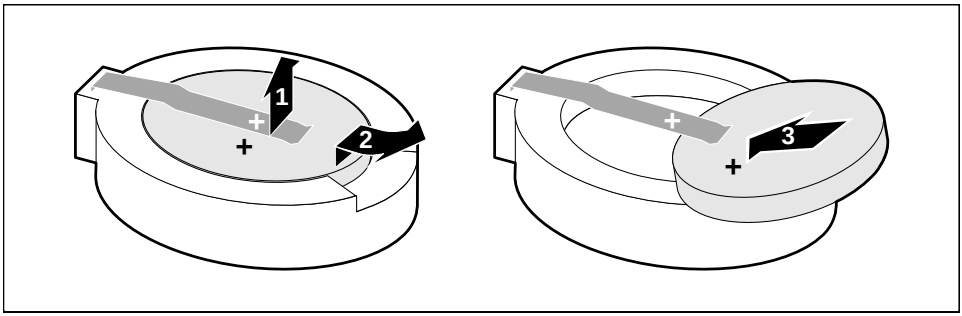
Information on which DRAM components you can use is available from your sales office or the customer service.
Note the location of the DRAM chip when you plug in DRAM chip!



- Insert the DRAM component in such a way in the socket for video memory that the mark on the upper side of the DRAM component (A) matches the position of the mark on the socket.

Replacing the lithium battery

Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).
Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.
Make sure that you insert the battery the right way round. The plus pole must be on the top!



- ► Lift the contact (1) a few millimeters and remove the battery from its socket (2).
- ► Insert a new lithium battery of the same type in the socket (3).
- ► Set the time and/or date in the BIOS Setup.

Settings in SCSI Setup

SCSI is the abbreviation for **S**mall **C**omputer **S**ystem **I**nterface.
The onboard ultra-wide SCSI controller (host adapter) is the interface between the internal bus (PCI bus) and devices with SCSI interfaces (SCSI devices).
The onboard ultra-wide SCSI controller is a PCI chip which uses Bus Master technology. This allows your SCSI controller to independently manage data transfer between your SCSI peripherals and the computer system memory, without requiring the involvement of your computer system CPU (Central Processing Unit).
All the information you require to install the SCSI Utility Software (e. g. drivers for MS-DOS, Windows 3.x) is contained in the User Guide for the SCSI Utility Software EZ-SCSI.
Details of how you install and operate your SCSI device may be found in the associated Manual.

Setting SCSI addresses (IDs)

Each device which is connected to the ultra-wide SCSI controller must be set to a separate SCSI address (ID 0 through ID 15).
The ultra-wide SCSI controller has ID 7. ID 7 has the highest priority, SCSI-ID 0 has the lowest. The priority of the remaining IDs, in descending order, is 15 to 8.

- ► Ensure that each SCSI device is assigned it's own address.

Details how you set the SCSI address of your SCSI devices may be found in the associated manual.

Connecting SCSI devices

SCSI devices and controllers are connected together via a common cable (SCSI bus).
The termination (terminating resistors) must be enabled (or installed) on the last device connected to the SCSI cable. The termination must be disabled (or removed) from all other SCSI devices.
How you activate or deactivate the termination of the SCSI devices, see description of your SCSI devices.

- ► Be sure the ends of the SCSI bus are correctly terminated.
- ► Connect the SCSI devices to the SCSI connector on the system board by means of the SCSI cable.

i Only single-ended SCSI devices may be linked to the ultra-wide SCSI controller. Most SCSI devices meet this requirement. If you are in any doubt, contact your sales office or customer service.

How you install internal devices in the system unit and connect them to the power supply is described in the Operating Manual or Technical Manual for your Server in the chapter "System unit" (paragraph "Installing a disk drive").
Further information is provided in the descriptions of your SCSI devices.

The following hints are only for the connectors at the onboard ultra-wide SCSI controller.

Connectors and cables
The connector of the ultra-wide SCSI controller is 68pin.
The connector of 8-bit SCSI devices is 50pin; the connector of 16-bit SCSI devices is 68pin.
If you want to connect 8-bit SCSI devices to the ultra-wide SCSI controller you need an adapter (from 68pin to 50pin).
If you want to operate an 8-bit SCSI device as the last device on a SCSI line you need an adapter (from 68pin to 50pin) with high-byte termination.

i Only use good quality SCSI lines, otherwise you may have transmission problems.

SCSI Setup

The BIOS of the ultra-wide SCSI controller includes a menu-driven *SCSI Setup*. This program allows you to change almost all of the option settings of the SCSI controller and the connected SCSI devices.
When you boot the system a SCSI-BIOS message listing the SCSI devices connected is displayed.

i If an SCSI-BIOS error message appears or problems arise with SCSI devices, please refer to the chapter entitled "Eliminating errors on the SCSI controller" and „SCSI BIOS messages“.
You may find further information in the documentation of your SCSI device.
If you are unable to trace or rectify the error, please contact your dealer or our service.

Starting the SCSI Setup

You must enable the ultra-wide SCSI controller in the system BIOS to be able to call the *SCSI Setup*. Call the *BIOS Setup* and set the *SCSI Controller* field in the *Peripheral Configuration* menu to *enabled*. The field *SCSI IRQ Line* may not be set to *disabled*.

- Start your PC and press key combination Ctrl and A, when the following message appears:

```
Press <Ctrl> <A> for SCSI Select (TM) Utility!
```

The first menu of the *SCSI setup*, *Configure/View Host Adapter Settings* and *SCSI Disk Utilities* is displayed.

Working with the keyboard
Use the following keys when running the program:

↓ ↑	to make selections
↵	to accept a selection
ESC	to call the previous menu and to terminate the *SCSI setup*.
F2	to reset to the default settings
F5	to toggle display between color and monochrome mode

Also note the status line at the bottom of the screen.

Terminating the SCSI setup

Depending on the current menu level, you can display the previous menu by pressing the ESC key. If you have made changes in the current menu you will be prompted to store them.

- Keep pressing ESC until you arrive at the first menu (*Configure/View Host Adapter Settings*).
- Press the ESC key in the first menu and then follow the instructions on the screen to terminate the *SCSI Setup*.

Default Settings in the SCSI setup

SCSI Bus Interface Definitions	**Default setting**
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	LowON/HighON

Additional Options	**Default setting**
Boot Device Options	
Boot Target ID	0
Boot LUN Number*	0
SCSI device configuration (for each SCSI device)	
SCSI device ID	1 to 15
Initiate Sync Negotiation	Yes
Maximum Sync Transfer Rate	20 Mbyte/s
Enable disconnection	Yes
Initiate wide negotiation	Yes
Send Start Unit Command**	Yes
Include in BIOS Scan	Yes
Advanced Configuration Options	**Default setting**
Reset SCSI Bus at IC Initialization	Enabled
Host Adapter BIOS	Enabled
Support Removable Disks Under BIOS as Fixed Disks**	Boot only
Extended BIOS Translation for DOS Drives >1 Gbyte**	Enabled
Display Ctrl + A Message During BIOS Initialization**	Enabled
Multiple LUN Support**	Disabled
BIOS Support for Bootable CD-ROM**	Enabled
BIOS Support for Int 13 Extensions**	Enabled
Support for Ultra SCSI Speed	Disabled

* The setting is valid only if *Multiple LUN Support* is *enabled*.
** The setting is valid only if SCSI controller BIOS is *Enabled*.

SCSI Bus Interface Definitions

Host Adapter SCSI ID

All SCSI devices on one SCSI bus, including the Ultra-Wide SCSI controller, must be set to separate SCSI IDs.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
: The ultra-wide SCSI controller is set to the displayed SCSI address (default entry: *7*).

SCSI Parity Checking

The ultra-wide SCSI controller uses parity bits on the SCSI bus to verify the data from your SCSI devices. Parity checking may not be supported on older SCSI devices. You must disable the option in this case.

Enabled Parity checking is enabled (default setting).

Disabled Parity checking is disabled.

If parity checking is disabled, this applies to all SCSI devices on the SCSI bus.

Host Adapter SCSI Termination

If the ultra-wide SCSI controller is the last device on the SCSI cable, its termination must be enabled. If the ultra-wide SCSI controller is not the last device on the SCSI cable, its terminator must be disabled.

LowON/HighON
: The termination is enabled (default entry).

LowOFF/HighOFF
: The termination is disabled.

Additional Options

Boot Device Options

Boot Target ID

The ultra-wide SCSI controller can start the operating system from a drive with any SCSI address (ID). The SCSI ID selected here must correspond to the ID configured on the boot device.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
: The ultra-wide SCSI controller boots from the drive with the displayed SCSI ID (default entry: *0*).

Boot LUN Number
If your boot device has multiple LUNs (Logical Unit Numbers) and *Multiple LUN Support* is *Enabled*, this option allows you to specify which LUN to boot from on your boot device.
0, 1, 2, 3, 4, 5, 6, 7
The ultra-wide SCSI controller boots with the displayed LUN (default entry: *0*).

SCSI Device Configuration

Initiate Sync Negotiation
Devices on the SCSI bus (including the SCSI controller) communicate intelligently with each other. Before data is transferred across the bus, the sending (initiating) and receiving (target) devices negotiate and agree on how long each piece of data will be, and how many pieces will be sent at a time - that is, they agree on how fast to talk.
If you have operating problems with older SCSI devices, you should disable *Initiate Sync Negotiation.* You may have to make settings on your SCSI devices (see the SCSI device description).
When *Sync Negotiation* is disabled, the Ultra-Wide SCSI controller will automatically go into synchronous mode if it receives a request from one of your SCSI devices. It can, however, also exchange data with slow SCSI devices.
Yes The function is enabled (default entry).
No The function is disabled.

i Synchronous data transfer is required for fast and ultra SCSI operation.

Initiate wide negotiation
This option determines whether the SCSI controller attempts 16-bit data transfer (Wide SCSI) instead of 8-bit data transfer.
Only disable *Initiate Wide Negotiation* if you do not use any wide SCSI devices or if 8 bit SCSI devices have problems during operation. You may have to make settings on your SCSI devices (see the SCSI device description).
Fast SCSI devices, including the ultra-wide SCSI controller, are capable of transferring data to and from the SCSI bus at speeds ranging up to 40 Mbyte/s.
Yes The function is enabled (default entry).
No The function is disabled.

Maximum Sync Transfer Rate
Fast SCSI devices (ultra-wide), including the ultra-wide SCSI controller, are capable of transferring data to and from the SCSI bus at speeds ranging up to 40 Mbyte/s at synchronous data transfer. If you have entered *Enabled* in the *Support for Ultra SCSI Speed* menu item, the transfer rate of 40 Mbyte/s is entered automatically.

Enable disconnection
SCSI devices can release the SCSI bus during command execution with this function. A typical example of this is a tape device that has no need to access the SCSI bus during rewinding and can be "disconnected" from the SCSI bus for this period.
You can disable the function if you have only connected one SCSI device. In this case, disconnection improves performance.
Yes The function is enabled (default entry).
No The function is disabled.

Send Start Unit Command
If the function is enabled, SCSI devices which support it are only started when they receive the "Start-Unit" command from the SCSI BIOS. This allows the SCSI devices to be activated consecutively. This is used if your system power supply is too weak to start several drives simultaneously or for preventing switchon current peaks.
You may have to make settings on your SCSI devices to enable support for this function (see the documentation for the SCSI devices).
Yes The function is enabled (default entry).
No The function is disabled.

Include BIOS Scan
The SCSI device can be used as the boot drive if this function is enabled. The SCSI device is accessed by the SCSI BIOS and is assigned a drive identifier. A message is output to the screen.
Yes The SCSI device can be the boot drive and is assigned a drive identifier (default entry).
No The SCSI device is not accessed by the SCSI BIOS.

This function should be set to *No* for drives which you know will never be used as the boot drive (e.g. DAT drives). This saves time during system startup.

Advanced Configuration Options

RESET SCSI Bus at IC
The SCSI bus is reset if you activate this menu item.
Enabled The SCSI bus will be reset (default entry).
Disabled The SCSI bus will not be reset.

Host Adapter BIOS

If the SCSI BIOS is disabled, the system cannot be booted from any of the SCSI devices connected to the SCSI bus.

The SCSI BIOS can be disabled if the SCSI devices can only be operated with additionally loaded drivers. This saves 16 Kbytes of system memory as well as time during system startup.
If you disable the SCSI BIOS, you can still call the *SCSI Setup* with the Ctrl + A keys during system startup and modify settings.

Enabled The SCSI-BIOS is enabled (default setting).
Disabled The SCSI BIOS is disabled.

Note that you will have to install additional drivers for your devices if the SCSI BIOS is disabled.

Support Removable Disks under BIOS as Fixed Disks
This option allows you to use removable-media drives, such as MO drives, without installing additional drivers.

Boot Only Only the removable-media drive designated as the boot device is treated as a hard disk (default setting).
All Disks All removable-media drives supported by the BIOS are treated as hard disk drives.
Disabled No removable-media drives are treated as hard disk drives. In this situation, software drivers are needed because the drives are not controlled by the BIOS.

If a removable-media device is controlled by the SCSI controller BIOS, do not remove the media while the server is switched on.

Extended BIOS Translation for DOS Drives > 1Gbyte
Enabling this option allows drives of up to 8 Gbyte capacity (2 Gbyte/partition) to be supported under MS-DOS 5.0 or higher. The SCSI BIOS must be enabled.
In earlier days, it was only possible to use drives with a capacity of up to 1 Gbyte under MS-DOS 5.0.

Enabled Drives up to 8 Gbytes can be used under MS-DOS 5.0 (default entry).
Disabled Drives up to 1 Gbyte can be used under MS-DOS 5.0.

Back up the data on your large capacity drive before enabling the option. After enabling this option, the drive must be re-partitioned and high-level formatted with the DOS *FDISK* and *FORMAT* programs.

Display Ctrl + A Message During BIOS Initialization
This option determines whether the
`Press <Ctrl> <A> for SCSISelect (TM) Utility!`
message appears on your screen during system startup.
If this setting is disabled, you can still invoke the *SCSI Setup* by pressing Ctrl + A at system startup.
Enabled The message is displayed during startup (default entry).
Disabled The message is not displayed during startup.

Multiple LUN Support
This option determines whether booting from a SCSI device that has multiple LUNs (Logical Unit Numbers) is supported.
Enabled The SCSI device will be used as the startup drive.
Disabled The SCSI device will not be used as the startup drive (default entry).

BIOS Support for Bootable CD-ROM
This option determines for booting from a CD-ROM drive.
Enabled It is possible to boot from the CD-ROM (default entry).
Disabled It is not possible to boot from the CD-ROM.

BIOS Support for Int 13 Extensions
This option determines whether the SCSI BIOS supports disks with more than 1024 cylinders. The default setting is *Enabled*.
Enabled Hard disk drives with more than 1024 cylinders are supported (default entry).
Disabled Hard disk drives with more than 1024 cylinders are not supported.

Support for Ultra SCSI Speed
This option determines whether the SCSI controller BIOS supports the fast transfer rate 40 Mbyte/s at 16-bit data transfer.
Enabled 40 Mbyte/s transfer rate is supported.
Disabled The function is disabled (default entry).

Change the default setting if you have connected ultra-wide SCSI devices to the SCSI controller.

SCSI Disk Utilities

When you select the *SCSI Disk Utilities* menu item, you are shown a list of all the devices connected to the SCSI bus. You are also offered two menus for hard disk drives: *Verify* and *Format Disk*.

Verify

With *Verify* you can have a selected hard disk drive checked. All defects that are detected will be entered in the existing error list for the hard disk.

Format Disk

With *Format Disk* a selected hard disk is formatted in low-level format. Normally hard disks are already formatted in low-level format. You should use this menu item only if you want to erase the hard disk completely and regenerate the error list.

Eliminating errors on the SCSI controller

Most problems with the onboard ultra-wide SCSI controller occur when SCSI devices are prepared (e.g. termination) and connected to the SCSI bus. Check the following points if you have problems with the ultra-wide SCSI controller or the connected SCSI devices:

- Are all SCSI devices supplied with power?
- Are the SCSI and power cables connected correctly on the SCSI device?
- Is the SCSI cable connected correctly to the system board?
- Has each SCSI device and the onboard SCSI controller been set to a different SCSI ID?
- Are the SCSI devices and the onboard SCSI controller correctly terminated?
- Is the SCSI controller activated in the system BIOS (*BIOS Setup*)?
- Is parity checking either enabled or disabled on all SCSI devices on the SCSI bus?

SCSI BIOS messages

The following messages can appear during system startup if you have enabled the SCSI BIOS:

`Device connected, but not ready`
: The SCSI device connected to the ultra-wide SCSI controller does not react to commands from the SCSI controller. Set *Send Start Unit Command* to *Yes* in the *SCSI Setup* for the SCSI device concerned. If the message still appears, check the settings required for the SCSI device in its documentation.

`Start unit request failed`
: The SCSI BIOS could not issue a start unit command to the SCSI device. Call the *SCSI Setup* and set *Send Start Unit* to *No* for the SCSI device concerned.

`Time-out failure during ...`
: A timeout has occurred. Check the SCSI bus termination. Remove the SCSI cable from the ultra-wide SCSI controller and restart the system. If system startup is successful, check the SCSI cable. One of the SCSI devices may be defective. Check the SCSI devices.