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# Service Maintenance Manual

STARION  
200  
300

## STARION 200/300 PC Family

EK-A0849-SV. A01

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## January 1996

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Created by:



MCS Logistics Engineering - Nijmegen

Printed in Ireland

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## Revision History

<i>Revision</i>	<i>Date</i>	<i>Description of change</i>
A01	Janary 1996	First release of the Service Manintenance Manual describing the STARION 200i/300i series computer.



## Preface

The Digital STARION 200/300 PC Family Service Maintenance Manual is a troubleshooting guide that can be used for reference when servicing the STARION 200/300 line of PC's.

Digital Equipment Corporation reserves the right to make changes to the Digital STARION 200/300 series without notice. Accordingly, the diagrams and procedures in this document may not apply to the serviced computer(s) since many of the diagnostic tests are designed to test more than one product.



### CAUTION

Digital recommends that only A+ certified engineers attempt to repair this equipment. All troubleshooting and repair procedures are detailed to support subassembly/module level exchange. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void warranty or exchange allowances.



# Chapter 1

# Product Description

## Product Introduction

The Digital STARION 200/300 computers are high-performance, multi-media, personal computers featuring the latest in computing technology. They can be used as stand-alone computers, as clients, or as servers in a network environment. Developed using the following state-of-the-art technology, these computers are the most value packed full-profile desktop computers in their class.

- ◆ AMD 486DX2 / 66mhz Microprocessor
- ◆ 8MB System RAM Memory, expandable to 68 MB
- ◆ S3 Trio 32 Onboard Video
- ◆ 1MB Video RAM, not upgradable
- ◆ Double-speed CD-ROM reader with industry-standard IDE/ATAPI interface and audio capability (STARION 300 only)
- ◆ Sophisticated fax/data/voice modem and 16-bit FM synthesis sound card

Some features of this card are:

- ◇ 14,400 bps internal fax/modem
- ◇ Error correction and data compression (V.42bis/MNP-5)
- ◇ Fax capability directly from Microsoft® Windows™ 3.1 applications
- ◇ Digital telephone answering machine
- ◇ 16-bit stereo recording at 11 kHz, 22 kHz and 44 kHz sampling
- ◇ 16-bit stereo playback at 8 kHz to 44 kHz sampling rates
- ◇ Supports Windows Sound System
- ◇ Support Sound Blaster™ and Sound Blaster Pro™ sound standards

## Product Models Information

### STARION 200/300 Models

<i>Product</i>	<i>Model</i>	<i>CPU</i>	<i>HDD</i>	<i>Memory</i>
STARION 200	FR-901AA-A2	486DX2	540MB	8MB
STARION 300	FR-901AA-A1	486DX2	540MB	8MB

<i>Product</i>	<i>CD-ROM</i>	<i>Fax/Mode/Sound</i>	<i>Cache</i>	<i>Tape</i>
STARION 200	Dual Speed	14K4 / 16 bit Stereo	None	None
STARION 300	Dual Speed	14K4 / 16 bit Stereo	None	None

## Chapter 2 Server Utilities & Configuration

### System Utilities

This chapter describes how to use the utilities and video drivers supplied with the STARION 200/300 computer. In most cases, these utilities and drivers have been factory installed as image files on the hard disk drive. However, before attempting to use any of the utilities or to install any of the video drivers, first all image files have to be copied onto diskettes using "Program Disks" and the "Driver Disks" tab from Digital Getting Started. Afterwards, use the created diskettes to run any of the utility programs and/or to install drivers.

This chapter also describes PHLASH.EXE, which is not supplied with the computer. This utility is available only via bulletin board distribution to customers needing BIOS upgrades.

#### Before Using System Utilities and Video Drivers

When unfamiliar with utility programs, video drivers and their uses, carefully read this chapter before attempting to use any of the utilities or installing video drivers.

#### Using System Utilities and Video Drivers

These utilities and video drivers enable to upgrade or restore the computer's BIOS and take full advantage of its Revision History enhanced video features. If this is the first time using these utility programs or video drivers, it is recommended to follow the procedures in the order given:

- 1) Turn on or reboot the computer. If POST detects an error, refer to *Chapter 4, "Troubleshooting"*, for possible causes and suggested solutions.
- 2) Run TRIORFSH.EXE to select the monitor type that matches the monitor's available resolution and refresh rates.
- 3) If necessary, run SMODE.EXE to emulate or display a non-standard VGA mode.
- 4) Install any Windows 3.x video drivers. Additional information about these drivers is provided later in this chapter.
- 5) Restart Windows so changes immediately take effect.

## PHLASH.EXE

All computers have BIOS software in a read-only, non-volatile memory (ROM) chip. This BIOS initializes hardware and boots the operating system when the computer is turned on. The BIOS also provides access to other services such as keyboard and disk drives.

The computer comes equipped with flash memory. This means the computer's BIOS can be restored simply by running the PHLASH.EXE utility. The computer's BIOS can also be upgraded to future releases by running PHLASH.EXE along with any flash BIOS update diskette if necessary.

### Before Using PHLASH.EXE

When not familiar with utility programs and their uses, carefully read the following instructions before attempting to use PHLASH.EXE.

Have the following items available:

- ◆ Blank 3½-inch 1.44 MB formatted diskette
- ◆ Diskette copy of the system utilities

### Creating a Crisis Recovery Diskette

A crisis recovery diskette should always be prepared before attempting to upgrade the BIOS. This diskette is used to reprogram the BIOS in case the flash process fails.

To create a crisis recovery diskette:

- 1) Turn on the computer and allow the POST to complete.  
If POST detects an error, refer to *Chapter 4, "Troubleshooting"* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the computer.
- 2) Insert the created diskette via the bulletin board and make sure the following files are in the UPGRADE directory:
  - MINIDOS.SYS
  - PHLASH.EXE
  - DEVTBLS.DAT
  - PHLASH.INI
  - STARION.ROM
  - MAKEBOOT.EXE
  - MAKECRD.EXE
- 3) Create the same directory on the hard disk drive and then copy the above files to it.
- 4) Insert a blank formatted diskette into drive A.
- 5) On drive A, make a directory for the files previously copied. From drive C: type **MAKECRD**. This copies the files to drive A.
- 6) Remove the crisis recovery diskette from drive A and store it in a safe place.



## Using the Crisis Recovery Diskette

The crisis recovery diskette must be used only if the computer's BIOS fails or if a BIOS upgrade was unsuccessful.

- ◆ POST detects an error after a normal boot cycle or a BIOS upgrade.
- ◆ The BIOS in the bootblock memory executes.
- ◆ The computer beeps several times.
- ◆ The diskette drive begins searching for the crisis recovery diskette.

If the computer's BIOS fails:

- 1) Set the recovery jumper (**J21**) to enabled.
- 2) Insert the crisis recovery diskette into drive A and power on the computer.
- 3) After the BIOS is restarted, turn off the power and remove the crisis recovery diskette from drive A.
- 4) Turn the power back on for normal operation.

## Upgrading The Computer's BIOS

Perform the following steps to update the computer's BIOS in the flash memory.

- 1) Turn on the computer and allow the POST to complete.  
If POST detects an error, refer to *Chapter 4, "Troubleshooting"* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the computer.
- 2) Create a crisis recovery diskette when not already done so. Refer to "*Creating a Crisis Recovery Diskette*" previously described.
- 3) Insert the system utilities diskette.
- 4) At the MS-DOS prompt, type: **A:\UPGRADE\PHLASH**.  
A screen appears on the monitor warning that the computer's BIOS is about to be erased.
- 5) Press **[Enter]** to continue. If not, press **[Esc]** to cancel.  
Once **[Enter]** is pressed, PHLASH.EXE automatically updates the computer's BIOS.
- 6) After the flashing process completes, the computer automatically reboots itself, so changes immediately take effect.
- 7) Remove the system utilities diskette.

## Utilities and Video Drivers

### Setting High Resolution Mode for The Monitor Display

To use the high resolution modes on the computer, perform the following steps:

- 1) Use the BIOS Setup utility to correctly set the Video System option.
- 2) Use TRIORFSH.EXE from the TRIO Video Driver diskette to correctly set a Monitor Type.
- 3) Use Windows Setup to copy the appropriate video driver into Windows.



#### CAUTION

**Do not connect a low resolution monitor to a system that has been configured with high-resolution video drivers. High resolution drivers can damage a 640 X 480 monitor.**

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### TRIORFSH.EXE

The video controller's monitor type selection must match the monitor's available resolution and refresh rates. These monitor resolution and refresh rates are listed in the monitor's support documentation and in the TRIORFSH.EXE utility.



#### CAUTION

**Do not select a monitor type setting that exceeds the monitor's resolution, refresh rate (vertical synchronization) and interlace or non-interlace specifications. Refer to the monitor's support documentation for performance specifications.**

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To select the correct monitor type:

- 1) Turn on or reboot the computer and allow POST to complete.
- 2) Insert the TRIO Video Driver diskette into drive A.
- 3) Type *A:*, then press **[Enter]**.
- 4) Type *CD\VIDEO* and press **[Enter]**.
- 5) Type *TRIORFSH* and press **[Enter]**.
- 6) Select the correct monitor type following the instructions on the monitor screen.  
For example:  
When running the monitor at a resolution of *1024 × 768*, select *1024x768@70Hz/NI*.
- 7) Exit the TRIORFSH.EXE utility following the instructions on the monitor screen.

## Using Windows 3.x Drivers

These files contain the available S3 Trio 32 video drivers for Windows 3.x. Depending on how the computer is configured and what software applications you plan on using, you might need to install one or more of these drivers to optimize the capabilities of the computer.

To install a Windows 3.x video driver, perform the following:

- 1) Type *CD WINDOWS* at the C:\> prompt, then press **[Enter]**  
The following prompt appears: C:\WINDOWS>.
- 2) Type *SETUP* and press **[Enter]**. The computer displays the SETUP screen.
- 3) Select the Display option and press **[Enter]**.
- 4) Toggle through the Display option to select the appropriate Windows 3.x driver.
- 5) Select the desired video resolution then press **[Enter]**.
- 6) If the appropriate video driver resides on a separate diskette, toggle through the Display option to select Other (Requires disk provided by hardware manufacturer).
- 7) Insert the diskette that contains the appropriate video driver and press **[Enter]**.
- 8) Select the desired video resolution then press **[Enter]**.

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**NOTE** The resolution and refresh rate must be the same as the selection made using the TRIORFSH.EXE utility.

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Example:

- 1) When selecting *1024x768@70Hz/NI* using the TRIORFSH.EXE utility, an appropriate selection is:  
*S3 Trio 32 V1.1 1024x768 256 Colors Large Fonts.*
- 2) The video setup screen appears again with the S3 driver.
- 3) Press **[Enter]** to accept the configuration.
- 4) The MS-DOS prompt appears when SETUP completes.
- 5) Type *WIN* and press **[Enter]** to start Microsoft Windows.

## SMODE.EXE

The SMODE utility allows the main logic board's video circuitry to emulate and display non-standard VGA modes.

With SMODE, software applications written for the following non-VGA modes can be runned:

- ◆ Monochrome adapter (MDA)
- ◆ Color graphics adapter (CGA)
- ◆ Expanded graphics adapter (EGA)
- ◆ Hercules monochrome graphics adapter (HGC)

Before using SMODE, read the information provided in any README file provided on the TRIO Video Driver diskette.

## BIOS Setup Utility

This chapter provides information on how to configure the computer using the BIOS Setup utility. If the computer was delivered with factory-installed software, it has already been configured.

When familiar with utility programs and their uses, refer to the appropriate sections in this chapter to set up or update the computer. Otherwise, carefully read this chapter before attempting to modify the computer's configuration settings.

### Running the BIOS setup Utility

The BIOS Setup utility enables to select and permanently store information about the computer's hardware and software in the battery-backed memory of the CMOS RAM. This information takes effect each time the computer boots and can be changed each time you run setup.

Use the BIOS Setup utility when experiencing problems with the hard disk or when reconfiguration of the computer is necessary. In addition, the BIOS Setup utility might need to be used to modify the configuration after you add or remove hardware, or change computer settings.

To run the BIOS Setup utility, perform the following steps:

- 1) Turn on the computer and allow the POST to complete.
- 2) Make a note of any configuration errors listed and then press **[F2]** to display the main menu.
- 3) Follow the instructions on the monitor screen and any on-line help pop-up screens to configure the computer.

### Updating The Computer's Configuration

The following sections list the BIOS Setup utility options that can be updated or modified using the following menu selections:

- ◆ Main — enables to set basic computer configuration options (time, date, video, etc.).
- ◆ Advanced — enables to set advanced features to increase computer performance (memory, COM ports, LPT port, etc.).
- ◆ Security — enables to set passwords and backup data reminders.
- ◆ Power — enables to set power saving options to conserve electricity and increase the life of the computer.
- ◆ Exit — enables to quit the current menu and save setup changes.

## Helpful Hints

Below are some helpful hints when using the BIOS Setup utility.

- ◆ Several keyboard function keys and numeric keypad keys are assigned to help to select menus and sub-menus, options, change option values and display help information. These keys are displayed at the bottom of the main menu and from the General Help pop-up screen.
- ◆ Item-specific help is available anytime during the setup process and appears at the right of the setup screen each time an option is highlighted. This on-line help provides information about a highlighted option.
- ◆ Select “*Save Changes & Exit*” to save all Setup values.
- ◆ Select “*Discard Changes & Exit*” to exit Setup without recording any changes.
- ◆ Select “*Get Default Values*” to set all Setup options to their default values.
- ◆ Select “*Load Previous Changes*” to restore all CMOS values from the last session.
- ◆ Select “*Save Changes*” to save all selections without exiting Setup.
- ◆ Press [Esc] to exit the Setup utility.

## Main Menu Options

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
<b>System time</b>	Current time	Displays the current time.
<b>System date</b>	Current date	Displays the current date.
<b>Language</b>	English Español Français Deutsch Italiano	Sets the desired language.
<b>Diskette drive A, Diskette drive B</b>	1.44 MB, 3½ 2.88 MB, 3½ Not Installed 360 KB, 5¼ 1.2 MB, 5¼ 720 KB, 3½	Sets the size and density of diskette drives.
<b>IDE adapter 0/1 master/slave</b>		
<b>Autotype fixed disk</b>		Press [Enter] to detect and fill in the installed hard disk drive parameters in the remaining fields.
<b>Type<sup>(1)</sup></b>	None to 39 User	Selecting None to 39 automatically fills in the remaining fields in this menu. Selecting User prompts to fill in the remaining fields with the installed hard disk drive's parameters. <sup>(2)</sup>
<b>Cylinders<sup>(1)</sup></b>	0 to 4095	Displays the number of cylinders.
<b>Heads<sup>(1)</sup></b>	1 to 64	Displays the number of heads.
<b>Sectors/track<sup>(1)</sup></b>	0 to 63	Displays the number of sectors/tracks.

<b>Landing zone</b>	0 to 4095	Displays the number of cylinders specified as the landing zone for read/write heads.
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**Main Menu Options** (continued)

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Write precomp</b> <sup>(1)(2)</sup>	0 to 4095 None	Displays the number of cylinders that have their write timing changed.
<b>Multi-sector transfers</b>	2 blocks 4 blocks 8 blocks 16 blocks Auto	Determines the number of sectors per block for multiple sector transfers Auto refers to the size the disk returns when requested.
<b>LBA mode control</b>	Disabled Enabled	Enables or disables the LBA hard disk drive addressing option.
<b>Video system</b>	EGA / VGA CGA 80x25 Monochrome	Sets the video controller type.

<sup>(1)</sup> These fields are automatically filled in if the computer auto-detected an installed hard disk drive.

<sup>(2)</sup> Incorrect settings can cause the computer to malfunction.

**Memory and Cache**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Internal cache</b>	Enabled Disabled	Enables or disables the computer's internal cache.
<b>External cache</b>	Enable Disable	Enables or disables the computer's external cache.
<b>System BIOS shadow</b>	Enabled Disabled	Enables or disables the computer's BIOS shadowing option. <b>NOTE:</b> This option should always be enabled.
<b>Cache System BIOS</b>	Enabled Disabled	Enables or disables the computer's BIOS caching option.
<b>Video BIOS shadow</b>	Enabled Disabled	Enables or disables the computer's video BIOS shadowing option.
<b>Cache Video BIOS</b>	Enabled Disabled	Enables or disables the computer's video BIOS caching option.
<b>Shadow Option ROM's: C800h- CFFFh D000h- D7FFh D800h- DFFFh</b>	Enabled Disabled	Allows to enable or disable shadowing of individual segments of ROM to increase computer performance. <b>CAUTION:</b> Some option ROMs do not operate properly when shadowed.

**Memory and Cache** (continued)

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>AT bus space</b>	Disabled	Memory hole not available; upper memory is contiguous.
	F80000h, .5MB	Sets the memory hole at address F80000 with .5 MB memory available.
	F00000h, 1MB	Sets the memory hole at address F00000 with 1 MB memory available.
	E00000h, 1/2MB	Sets the memory hole at address E00000 with 1 or 2 MB memory available.
	C00000h, 4MB	Sets the memory hole at address C00000 with 4 MB memory available

**Boot Options**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Boot sequence</b>	A: then C: C: then A: C: only	Each time the computer boots, it will load the operating system from the sequence selected.
<b>SETUP prompt</b>	Enabled Disabled	Enables or disables the <F2> setup prompt each time the computer boots.
<b>POST errors</b>	Enabled	Enabling this options causes the computer to pause and display a setup entry or resume the boot prompt if an error occurs at boot.
	Disabled	Disabling this option causes the computer to always attempt to boot regardless of a setup error.
<b>Floppy check</b>	Enabled	Enabling this option causes the computer to verify the diskette type each time the computer boots.
	Disabled	Disabling this option speeds up the boot process.
<b>Summary screen</b>	Enabled	Enabling this option causes the computer to display configuration parameters (in the form of a summary screen) during boot.
	Disabled	

**Keyboard Features**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Numlock</b>	Auto	Turns NumLock on or off each time the computer boots <b>NOTE:</b> When selecting Auto, the computer will turn on NumLock if it detects a numeric keypad.
	On	
	Off	
<b>Key click</b>	Disabled	Enables or disables the audible key click feature.
	Enabled	



<b>Keyboard auto-repeat rate</b>	2/sec	Sets the number of times a second to repeat a keystroke while holding the key down.
	6/sec	
	10/sec	
	13.3/sec	
	18.5/sec	
	21.8/sec	
	26.7/sec	
	30/sec	

**Keyboard Features** (continued)

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Keyboard auto-repeat delay</b>	1/4 sec 1/2 sec 3/4 sec 1 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.
<b>System memory</b>	Not user selectable	Displays the amount of base (conventional) memory each time the computer boots.
<b>Extended memory</b>	Not user selectable	Displays the amount of extended memory each time the computer boots.

**Integrated peripherals**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Mouse port</b>	Disabled Enabled	Enables or disables the mouse port.
<b>Parallel port</b>	Auto Disabled 3F8, IRQ 7 3BC, IRQ 7 278, IRQ 5	Enables or disables the onboard port at the specified address.
<b>Parallel port mode</b>	Compatible mode.  Bi-directional mode	Sets the onboard parallel port mode. Standard printer connection.  PS/2 compatible mode and enable to receive data.
<b>Serial port 1</b>	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 1 at the specified address. <b>NOTE:</b> If the computer is connected to a network, see the System Administrator.
<b>Serial port 2</b>	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 2 at the specified address. <b>NOTE:</b> If the computer is connected to a network, see the System Administrator.
<b>Diskette controller</b>	Enabled Disabled	Enables or disables the onboard diskette controller.
<b>Exchange diskette drives</b>	Disabled Enabled	Enables to logically exchange physical diskette drive designations.
<b>Diskette write protection</b>	Disabled Enabled	Enables or disables the selected diskette drive's write protect option.

**Integrated peripherals** (continued)

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>IDE adapter 1</b>	Enabled Disabled	Enables or disables the onboard IDE controller.

**Advanced chipset control**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>VGA Feature connector</b>	Enabled	Use with VGA add-in cards to inform card not to claim VGA palette writes.
	Disabled	Use to inform VGA add-in cards to claim VGA palette writes.
<b>Large disk access mode</b>	DOS Other	Select <b>DOS</b> when MS-DOS is installed. Select <b>Other</b> when another operating system is installed. A large disk drive constitutes one that has more than 1024 cylinders, 16 heads, or 63 tracks per sector.

**Security Options**

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
<b>Supervisor password is</b>	Not user selectable	Tells whether or not the supervisor's password is enabled or disabled.
<b>User password is</b>	Not user selectable	Tells whether or not the user's password is enabled or disabled.
<b>Set supervisor password</b>	Press [Enter]	Enables to set a supervisor password. <b>NOTE:</b> Entering Setup with a supervisor password provides full access to all BIOS Setup utility menus.
<b>Set user password</b>	Press [Enter]	Enables to set a user password. <b>NOTE:</b> Entering Setup with a user password restricts access to certain BIOS Setup utility menus. Also, this option requires prior setting of the supervisor password.
<b>Password on boot</b>	Enabled	Enables or disables the enter password on boot option.
	Disabled	<b>NOTE:</b> This option requires prior setting of the supervisor/user password.
<b>Diskette access</b>	Supervisor User	Enables to control who has access to diskette drives.
<b>Fixed disk boot sector</b>	Normal Write protect	Enables to write protect the boot sector on the hard disk drive.
<b>Network server</b>	Enabled Disabled	This option keeps the computer from being accessed during network operation.

<b>System backup reminder</b>	Disabled Daily Weekly Monthly	Enables or disables the system backup reminder message.
-------------------------------	--	---

**Security Options** (continued)

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
<b>Virus check reminder</b>	Disabled Daily Weekly Monthly	Enables or disables the virus check reminder message.

**Power Options**

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
<b>Power management</b>	Enabled Disabled	Enables or disables the computer's power management options.
<b>Monitor suspend timer</b>	Disabled 1 min. 5 min. 10 min. 20 min. 30 min.	Allows to disable the monitor suspend feature or after a set period of keyboard, mouse, or keyboard controller inactivity, allows to place the monitor in a suspend state (minimum power saving state).
<b>Monitor off timer</b>	Disabled 1 min. 5 min. 10 min. 20 min. 30 min.	Allows to disable the monitor off feature, or after a set period of keyboard or mouse inactivity, allows to place the monitor in an off state (one-half power saving state).
<b>Hard disk suspend timer</b>	Enabled Disabled	Allows to disable or enable the hard disk suspend timer feature, or after a set period of disk drive inactivity (approximately 21 minutes), allows the hard disk drive to spin down its motor to save power.
<b>System suspend timer</b>	Disabled 1 min. 30 min. 1.5 hours 2 hours 3 hours 6 hours 12 hours	Allows to disable the system suspend feature or after a set period of computer inactivity, allows to place the computer in a suspend state (maximum power saving state).



## Chapter 3

## Service Procedures

### Safety Requirements

**WARNING**

Static electricity collects on non-conductors such as paper, cloth, or plastic. A static discharge can be damaging even though it often cannot be felt or seen.

The following safety precautions must be observed to insure product and personal safety and prevent damage to circuit boards and/or components:

- ◆ Always wear an ESD wrist strap when handling ESD sensitive material and be sure it is properly connected.
- ◆ Keep circuit boards and components away from non-conductors.
- ◆ Keep clothing away from circuit boards and components.
- ◆ Keep circuit boards in anti-static bags.
- ◆ Be cautious when AC power is exposed when working on an assembly.
- ◆ Always use an ISOLATION TRANSFORMER when diagnosing any terminals, monitors or power supplies when AC power is applied.
- ◆ Be cautious of very high voltage potentials when working with monitors.

There should be an approved insulating mat (for technician safety) in front of any workbench where monitors, terminals or power modules are being serviced when power is applied.

**NOTE** Do NOT wear ESD straps when working on terminals, monitors or power supplies when AC power is applied. This is to avoid the hazard of electrical shock.

## Recommended Tools

The following tools are needed for servicing Digital PC systems. Note that test equipment must be calibrated.

- ◆ Multimeter (4 1/2 digit)
- ◆ A philips screwdriver
- ◆ An antistatic wrist strap

## Other Needed Materials

Cleaning agent should be an all purpose cleaner that is used in-house.

## Remedial Diagnostic Test Software

- ◆ *QAPLUS/fe* , PC Advanced Diagnostic Software, latest version.

Supplier information:

**Diagsoft, Inc.**  
5615 Scotts Valley Drive, Suite 140  
Scotts Valley, California 95066, U.S.A.  
Voice: 1-408-438-8247  
Fax: 1-408-438-7113  
Internet: <http://www.diagsoft.com> (Diagsoft, Inc. homepage)

## Recommended Virus Detection and Cleanup Software

- ◆ *F-PROT*, Virus Detection and Cleanup Software, latest version.

Supplier information:

North America, South America, Australia and New Zealand:

**Command Software Systems Inc.**  
Tel: +1-407-575 3200  
Fax: +1-407-575 3026

Most of Europe, Africa, Middle and Far East:

**Data Fellows Ltd**  
Paivantaite 8  
FIN-02210 ESPOO  
FINLAND  
tel: +358-0-478 444  
fax: +358-0-478 44 599  
e-mail: [f-prot@datafellows.fi](mailto:f-prot@datafellows.fi)  
Internet: <http://www.datafellows.fi> (Data Fellows Ltd. homepage)



## ECO/FCO Information

### BIOS version information

Refer to the Digital DECpc Bulletin Board Support (telephone number: **1 - 508 - 496 - 8800**) for the latest information on BIOS upgrades.

**NOTE** This BBS is **NOT** a source for technical support. For advice, please call the Digital Equipment Service Representative **1-800-354-9000**

## Unlocking and Removing the Cover



### WARNING

You might injure yourself or damage the computer if you attempt to remove the cover before unplugging ac and monitor power cords.

The computer's cover must be removed prior to install any hardware option.

To remove the cover:

- 1) Unlock cover.
- 2) Lift both side locks out, then turn towards front of computer to release cover from chassis.
- 3) Carefully slide cover toward front of chassis until it clears lip of front bezel.
- 4) Carefully lift cover from chassis.

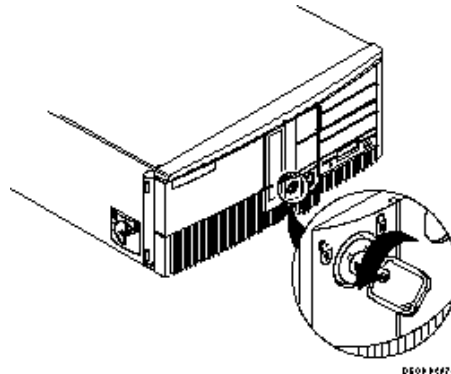
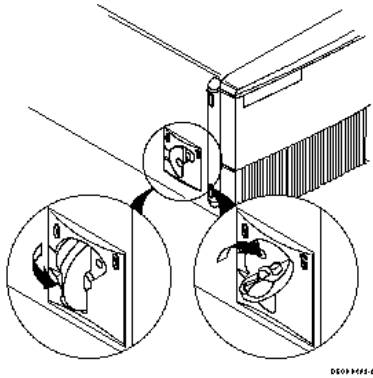
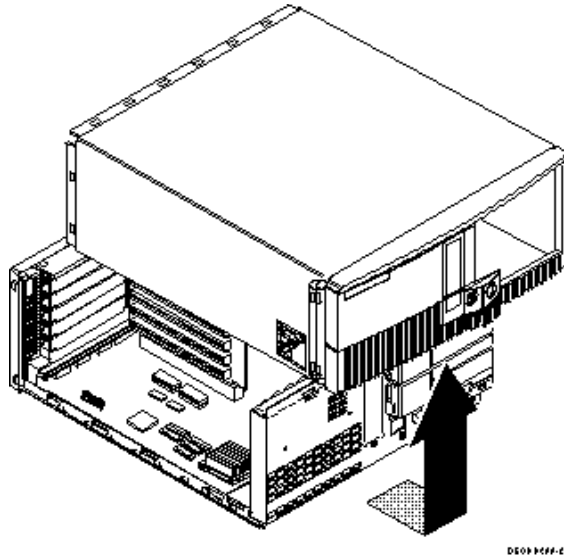


Figure 3 - 1 Unlocking the Cover

**Unlocking and Removing the Cover (continued)**



**Figure 3 - 2 Release Cover**



**Figure 3 - 3 Removing the Cover**

## Computer Components

<i>Legend</i>	<i>Description</i>
A	Power supply
B	Main logic board
C	Front access 3½-inch diskette drive
D	Front access drive bay (supports one 5¼-inch drive and one 3½-inch drive or two 5¼-inch drives)
E	Front internal drive bay
F	Riser card supports up to four full-height ISA expansion boards and one half-height ISA expansion board
G	Rear internal drive bay (under power supply)

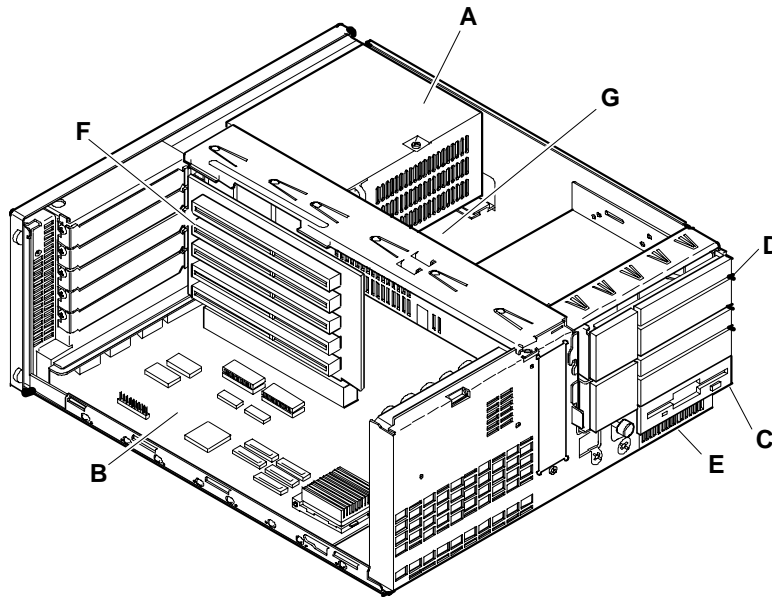
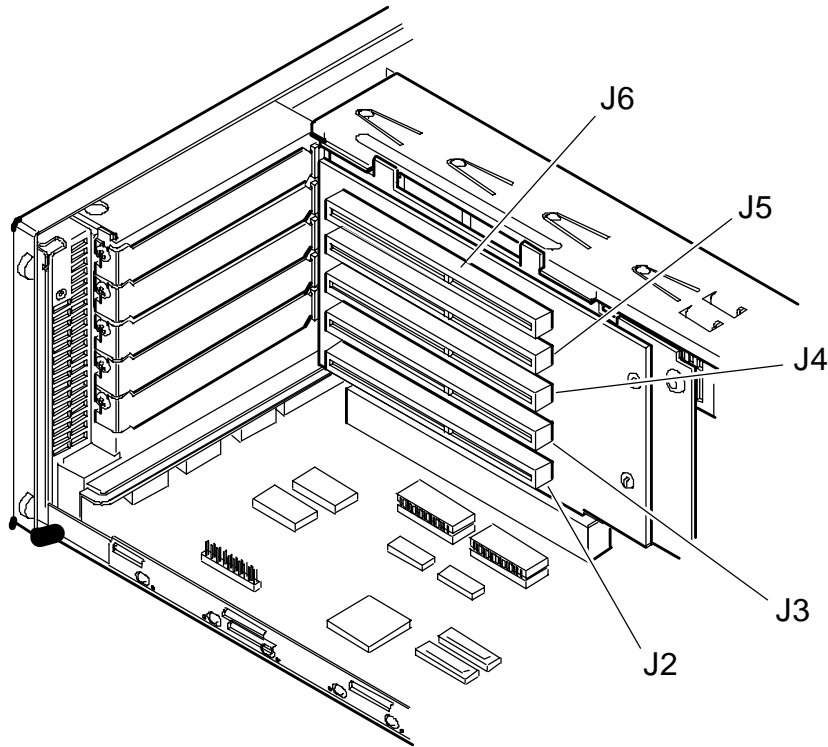


Figure 3 - 4 STARION 200/300 Computer Components

## Expansion Slots

The STARION 200/300 computer models contain six slots for installing up to five full-length and one half-length ISA expansion boards. These five slots are located on the computer's riser card; the sixth (personality slot) is on the main board.

<i>Expansion Slot</i>	<i>Slot Type</i>	<i>Description</i>
<b>J3 to J6</b>	ISA	Supports full-length industry-standard 16-bit ISA expansion boards. Uses the top four expansion slots at the rear panel.
<b>J2</b>	ISA	Supports half-length industry-standard 16-bit ISA expansion boards. Uses the fifth expansion slot at the rear panel.



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**Figure 3 - 5 STARION 200/300 Models Expansion Slots**

## Main Logic Board Jumpers

Jumper pins allow to set specific computer parameters. They are set by changing the pin location of jumper blocks. Note that the square pin of each jumper block is pin 1. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.



### CAUTION

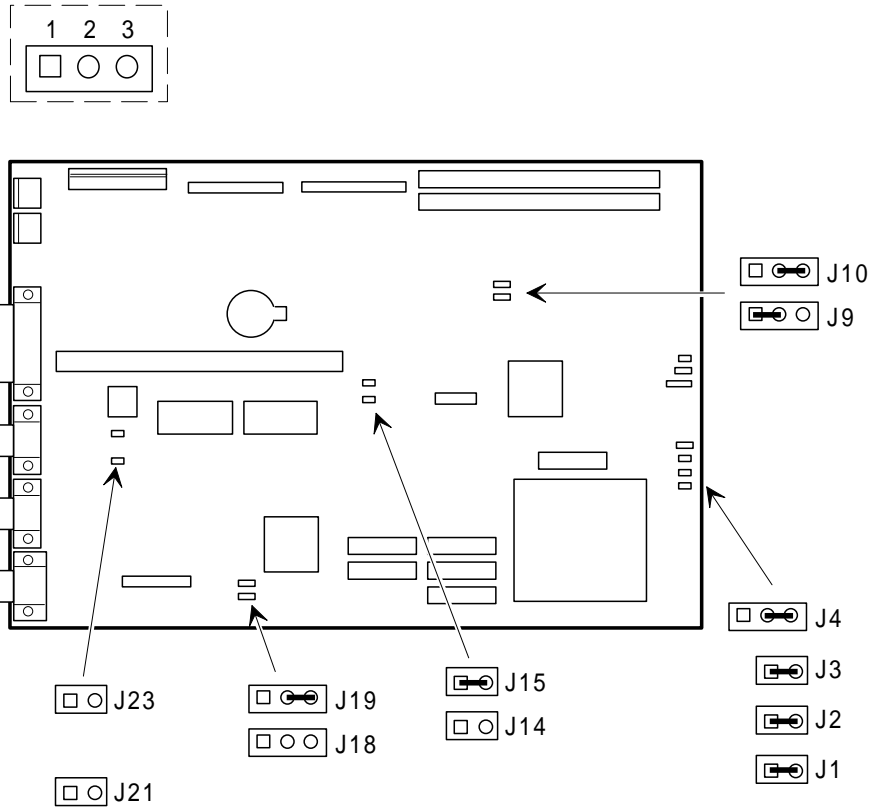
Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system box chassis. A static discharge from your fingers can result in permanent damage to electronic components.

### STARION 200/300 Main Logic Board Jumper Settings

<i>Feature</i>	<i>Description</i>	<i>Setting</i>
<b>CPU type</b>	AM486DXL, AM486DXL2 Others	J1 and J2, jumpered <sup>(1)</sup> J1 and J2, open
<b>MFG testing</b>	Factory Setting	J3, jumpered <sup>(1)</sup>
<b>CPU type</b>	AM486DXL, AM486DXL2 Others	J4, pins 2 and 3 jumpered <sup>(1)</sup> J4 pins 1 and 2 jumpered
<b>CPU type</b>	P24T, P24D, AM486DXL, AM486DXL2 Others	J9, pins 1 and 2 jumpered <sup>(1)</sup> J9, pins 2 and 3 jumpered
<b>CPU type</b>	AM486DXL, AM486DXL2 Others	J10, pins 2 and 3 jumpered <sup>(1)</sup> J10, pins 1 and 2 jumpered
<b>CPU clock</b>	40 MHz  33 MHz <sup>(1)</sup>  25 MHz	J14, jumpered J15, open  J14, open <sup>(1)</sup>  J15, jumpered <sup>(1)</sup> J14, open J15, open
<b>Snoop select</b>	Enable <sup>(1)</sup> Disable	J18, pins 1 and 2 jumpered <sup>(1)</sup> J18, pins 2 and 3 jumpered
<b>Onboard VGA</b>	Enable <sup>(1)</sup> Disable	J19, pins 2 and 3 jumpered <sup>(1)</sup> J19, pins 1 and 2 jumpered
<b>Recovery mode</b>	Recovery mode Normal <sup>(1)</sup>	J21, jumpered J21, open <sup>(1)</sup>
<b>Password clear</b>	Password clear (MFG test) Normal mode <sup>(1)</sup>	J23, jumpered J23, open <sup>(1)</sup>

(1) Factory default setting

### STARION 200/300 Main Logic Board Jumper Locations



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Figure 3 - 6 Main Logic Board Jumper Locations



## Computer Memory Configurations

Adding more memory allows the computer to run larger, more complicated software and run it faster. The STARION 200/300 computer comes with 4 MB of memory hardwired to the main logic board. The STARION 200 also comes with 4 MB installed in bank 1 for a total of 8 MB. The computer's amount can be increased up to 68 MB.

However, when adding additional memory make sure to:

- ◆ Install 32-bit SIMMs having an access time of 70 ns or less. Supported SIMM sizes: 4 MB, 8 MB, 16 MB and 32 MB.
- ◆ Fill bank 1 before 2.

**NOTE** 36-bit SIMMs will also work, however, the four parity checking bits are not supported.

### STARION 200/300 Memory Configurations

<i>Bank 0 (Fixed)</i>	<i>Bank 1</i>	<i>Bank 2</i>	<i>Total</i>
4 MB			<b>4 MB</b>
4 MB	4 MB		<b>8 MB</b>
4 MB	4 MB	4 MB	<b>12 MB</b>
4 MB	8 MB		<b>12 MB</b>
4 MB	4 MB	8 MB	<b>16 MB</b>
4 MB	8 MB	8 MB	<b>20 MB</b>
4 MB	16 MB		<b>20 MB</b>
4 MB	4 MB	16 MB	<b>24 MB</b>
4 MB	8 MB	16 MB	<b>28 MB</b>
4 MB	16 MB	16 MB	<b>36 MB</b>
4 MB	32 MB		<b>36 MB</b>
4 MB	4 MB	32 MB	<b>40 MB</b>
4 MB	8 MB	32 MB	<b>44 MB</b>
4 MB	16 MB	32 MB	<b>52 MB</b>
4 MB	32 MB	32 MB	<b>68 MB</b>

### STARION 200/300 SIMM Sockets Locations

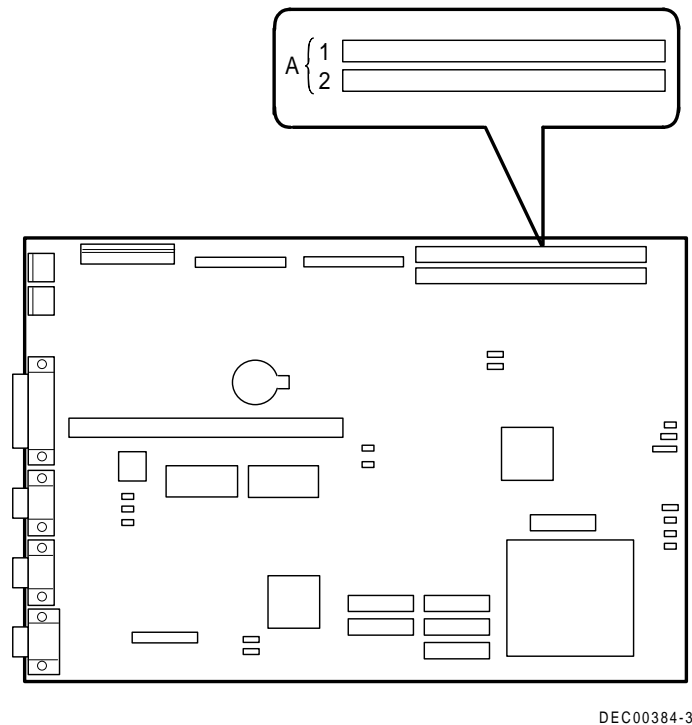


Figure 3 - 7 STARION 200/300 SIMM Socket Locations

## Part Removal and Replacement

### Opening the Device Bay & Power Supply Subassembly

The device bay & power supply subassembly must be opened in order to install, remove and/or connect certain components and peripheral devices.

To open the subassembly:

- 1) Turn off the computer.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Pull tab (A) toward front of computer to release subassembly.
- 5) Lift up on subassembly and lock in place.

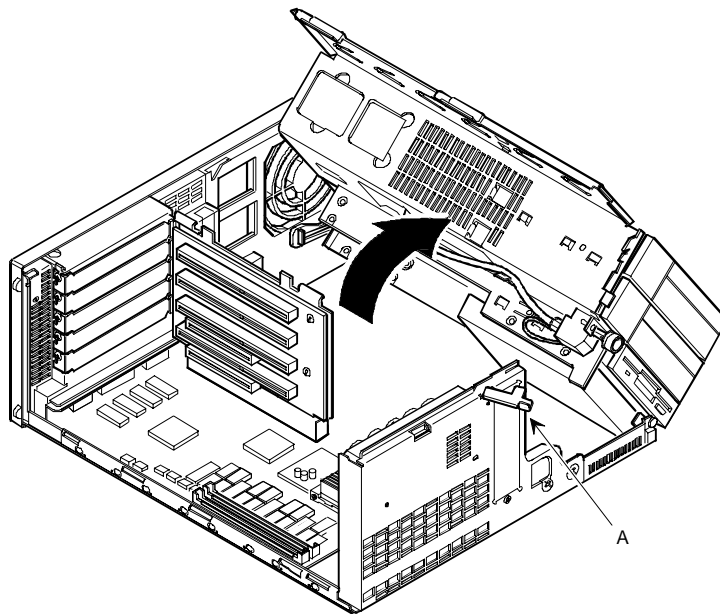


Figure 3 - 8 Opening the Device Bay & Power Supply Subassembly

## Removing the 3½-Inch Diskette Drive.

To remove the 3½-inch diskette drive:

- 1) Turn off the computer.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Remove two screws securing the right side of diskette drive to chassis.
- 5) Open the device bay & power supply subassembly.
- 6) Refer to “*Opening the Device Bay & Power Supply Subassembly*”.
- 7) Disconnect power and ribbon cables.
- 8) Remove two screws securing the right side for SL models and left side for FP models of diskette drive to chassis.
- 9) Slide the diskette drive out of the front of the chassis.

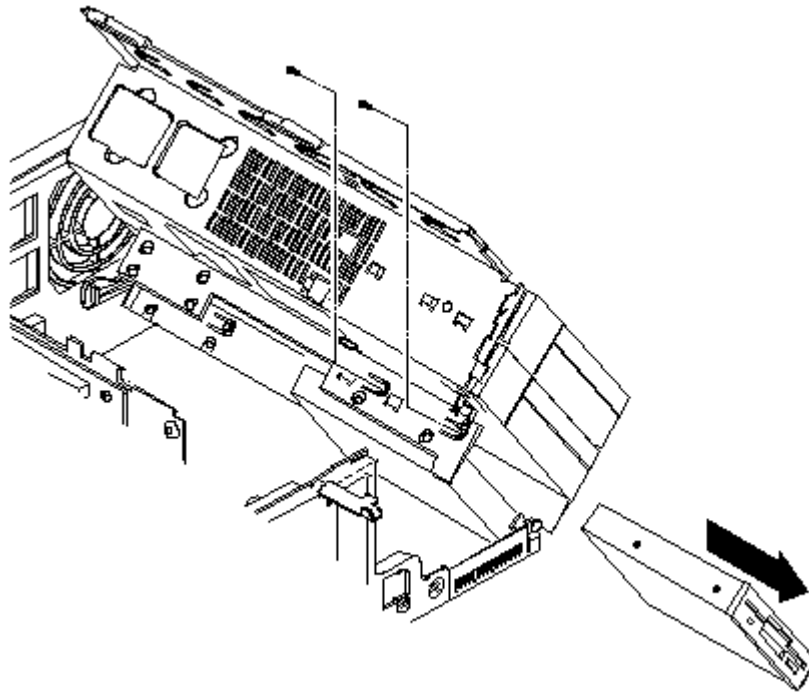


Figure 3 - 9 Removing the 3½-Inch Diskette Drive

## Removing the Main Logic Board

To remove the main logic board:

- 1) Turn off the computer.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Remove all connectors.
- 5) Remove all expansion boards.
- 6) Remove the riser card and bracket.
- 7) Remove screws and lift the board out.

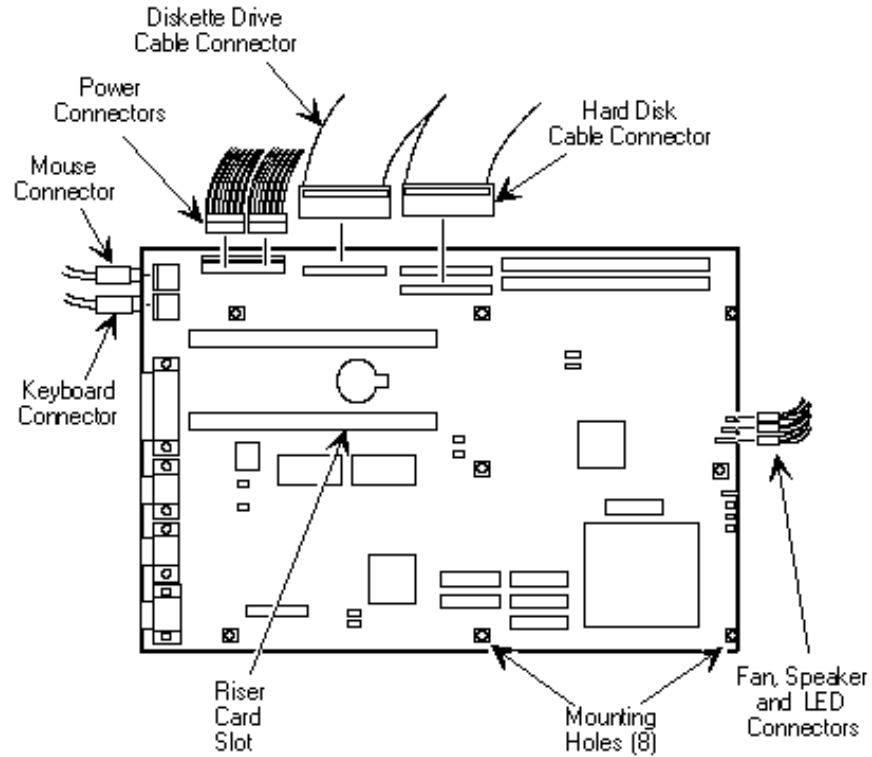


Figure 3 - 10 Removing the Main Logic Board

## Removing the Power Supply

To remove the power supply:

- 1) Perform the steps necessary to open the device bay and power supply subassembly.
- 2) Remove power supply, IDE and diskette cabling from main logic board noting their proper orientation.
- 3) While holding the device bay and power supply subassembly, carefully release the rear latch.
- 4) Carefully slide entire subassembly away from chassis and place upside down on antistatic surface.
- 5) Loosen two screws securing power on/off switch to chassis.
- 6) Remove screws securing power supply to chassis.
- 7) Remove power supply and power on/off switch from the subassembly.

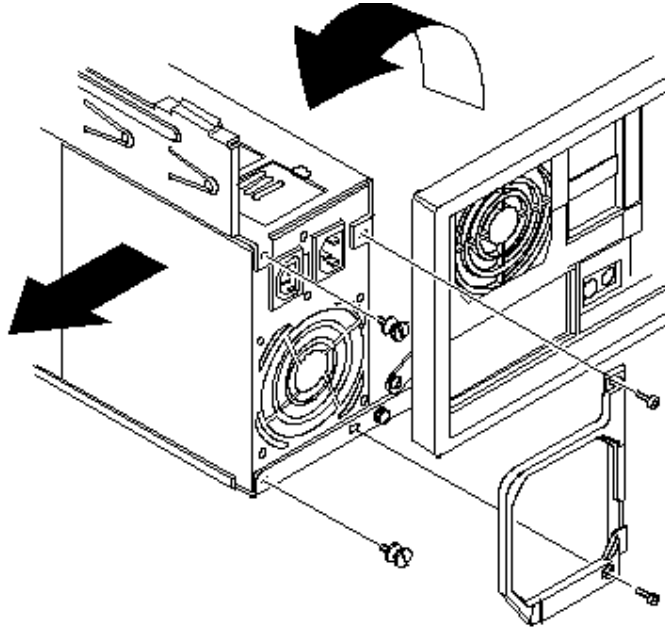


Figure 3 - 11 Removing the on Power Supply

## Removing the Riser Card & Bracket

To remove the riser card and bracket:

- 1) Turn off the computer.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Remove all expansion boards.
- 5) Carefully lift riser card and bracket from computer.

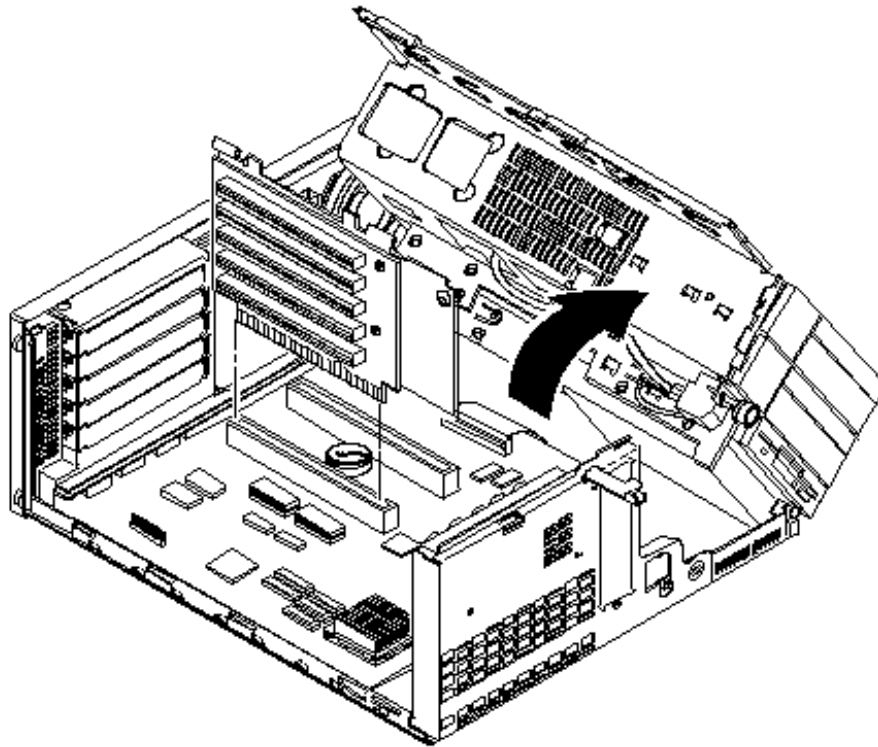


Figure 3 - 12 Removing the Riser Card & Bracket

## Installation Procedures

### Installing External Cache Memory

The Main Logic Board supports 128 KB of write-back external cache to improve the performance of the enhanced CPU. The secondary cache memory consists of four 32 KB x 8, 15 ns cache SRAM chips and two 32 KB x 8, 15 ns cache tag SRAM chips.

<b>Cache Upgrade</b>	<b>Main Logic Board Cache Sockets</b>	<b>Main Logic Board Cache Tag Sockets</b>
<b>0 KB</b>	X	X
<b>128 KB</b>	E25 -E27, E37	E11, E38

To install a cache SRAM chip:

- 1) Turn off the computer, disconnect external devices, ac power and monitor power.
- 2) Unlock and remove cover.
- 3) Locate appropriate DIP sockets on main logic board.
- 4) Remove SRAM chips from anti-static bag, handling each chip only by edges.
- 5) Install new external cache and tag cache SRAM chips, aligning notches on chip with notches in DIP socket.
- 6) Replace and lock cover, connect external devices and restore power.
- 7) If necessary, run BIOS Setup utility and enable external cache option.



#### **CAUTION**

**Installing external cache memory incorrectly might cause the computer to malfunction.**



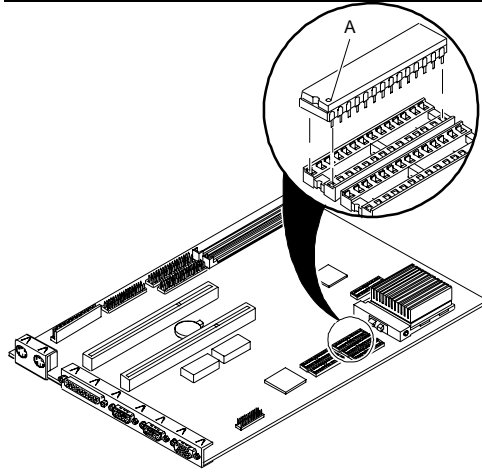


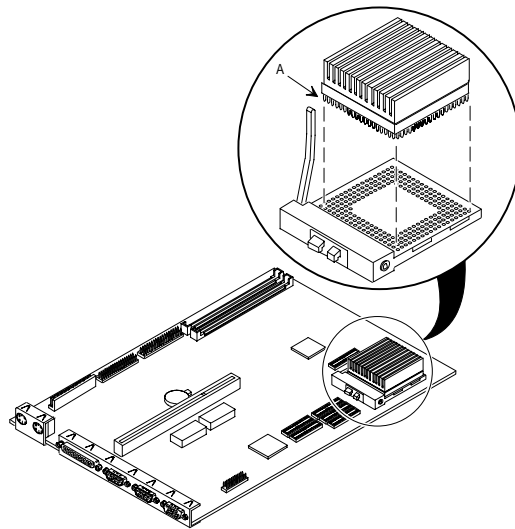
Figure 3 - 13 Installing External Cache Memory

## Installing a Higher Performance CPU

The STARION 200/300 main logic board is equipped with a 486 processor installed in a ZIF socket (Socket type 3).

To install a higher performance CPU:

- 1) Turn off the computer.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Lift up on lever to release old CPU.
- 5) Remove old CPU.
- 6) Install new CPU.
- 7) Make sure pin 1 on CPU (notched corner) is aligned with pin 1 on ZIF socket (designation A on Figure 3 - 14).
- 8) The CPU heat sink might look different from the one shown.
- 9) Return release lever to its original position and then set all appropriate CPU jumpers.
- 10) Replace and lock cover. Refer to *"Replacing and Locking the Cover"* later in this chapter.
- 11) Connect external devices and restore power.



**Figure 3 - 14** Installing a Higher Performance

## Replacement Procedures

### Replacing the Computer Battery

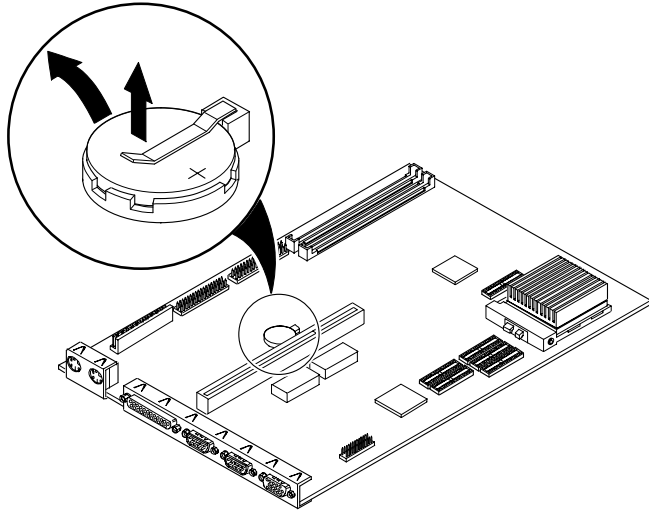
The STARION 200/300 computer battery runs the computer clock and retains any setup information when it is turned off. If the computer ever fails to retain the correct date, time, or configuration settings when it is turned on, the computer's battery has to be replaced.

**WARNING**

**There is a danger of battery explosion if a lithium battery is incorrectly replaced. To prevent damage to the computer, be sure the + side faces up when installing a new battery. Also, be sure to replace the battery with either a Digital (P/N 12-41474-05), 3 V dc, lithium battery or equivalent. Depending on your locality, the computer's battery might be considered hazardous waste. Make sure to follow any state or local statute to properly get disposed of the old battery.**

To replace the battery, perform the following:

- 1) Record computer configuration settings using the BIOS Setup utility.
- 2) Turn off the computer, disconnect external devices, ac power and monitor power.
- 3) Unlock and remove cover.
- 4) Carefully lift up on retaining clip and remove old battery.
- 5) Install new battery. When installing new battery, make sure "+" side faces up.
- 6) Replace and lock cover, connect external devices and restore power.
- 7) Run BIOS Setup utility to reconfigure computer using recorded configuration settings from step 1.



**Figure 3 - 15 Replacing the Battery**

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## Connecting Diskette and IDE Devices

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**NOTE** If only one IDE device is installed, make sure to use the ribbon cable connector furthest from the main logic board connector.

Also, when having installed IDE devices in both internal drive bays, make sure that the ribbon cable has no twists between the two IDE drives.

---

To connect diskette and IDE devices, perform the following:

- 1) Unlatch device bay and power supply subassembly.
  - 2) Lift up on subassembly and lock in place.
  - 3) Connect supplied ribbon cable to appropriate device. If necessary, refer to the illustration in the appropriate data cable connection topic listed below.
  - 4) Connect appropriate power cable to device.
  - 5) Release device bay and power supply subassembly rear latch.
  - 6) Close subassembly and then secure to chassis using front locking mechanism.
  - 7) Replace and lock cover.
  - 8) Connect external devices and restore power.
  - 9) Run BIOS Setup utility to configure computer.
- 

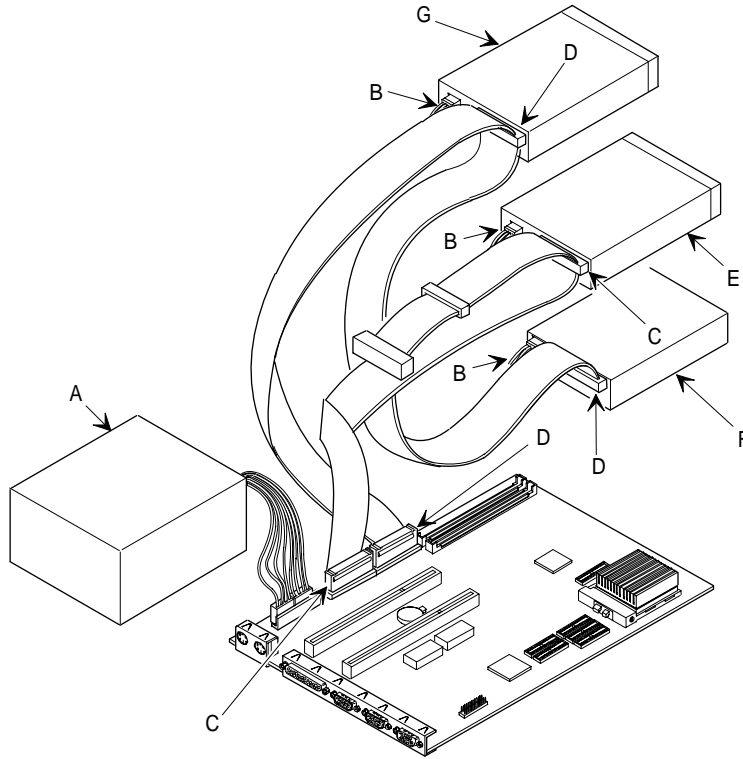
**NOTE** Make sure cable is connected with correct orientation. Most cables and sockets are keyed so they cannot be connected backwards. If the cable or device is not keyed, pin 1 of cable has to be connected to pin 1 of device's socket.

Pin 1 of cable is on edge with colored stripe. Pin 1 of device's socket should be marked with a number or symbol at one end of socket or with a number or symbol printed on circuit board near one end of socket. If necessary, refer to the device's documentation for pin 1 orientation.

---

**Connecting Diskette and IDE Devices**

<i>Legend</i>	<i>Component</i>
<b>A</b>	Power supply
<b>B</b>	Power connections
<b>C</b>	Diskette drive connections
<b>D</b>	IDE drive connections
<b>E</b>	Diskette drive
<b>F</b>	IDE hard disk drive
<b>G</b>	CD-ROM



DEC00413-2

**Figure 3 - 16 Diskette/IDE Drive Data Cable Connections**

## Chapter 4

## Troubleshooting

The following pages provide initial troubleshooting procedures and tables listing specific problems, probable causes and recommended actions to take if the computer fails after configuring or installing optional hardware or software.

Refer to the documentation supplied with additional options when experiencing problems with specific installed options.

### Initial Troubleshooting

Follow these general procedures to troubleshoot the STARION 200/300 PC family of computers:

- ◆ Press **[Ctrl] + [Alt] + [Del]**. If the computer fails to boot, turn it off, wait until all hard disk drives spin down completely and then turn it back on.
- ◆ If the POST detects an error refer to *Chapter 4, "Troubleshooting"* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the computer.
- ◆ Run the BIOS Setup utility.
- ◆ Make sure all necessary changes have been made to the CONFIG.SYS and AUTOEXEC.BAT files
- ◆ Make sure all necessary video, printer and application device drivers are properly installed.
- ◆ Ensure that all cables and connections are secure.
- ◆ Run the *QAPLUS/fe* advanced diagnostic software.
- ◆ If these steps do not identify and/or correct the problem, perform the specific troubleshooting procedures appropriate to the circumstances.

---

**NOTE** If you need to return a failed component, pack it in its original container and return it to Digital for service

---

**Fill in the appropriate fields of the Part Exchange Form with the relevant error information!!**

## Beep Codes

When POST finds an error and cannot display a message, the computer's speaker emits a series of beeps to indicate the error. During POST, if the video configuration fails or if an external ROM module fails a checksum test, then the computer beeps three times.

<b>BeepCode</b>	<b>Error</b>
<b>1 long - 2 shorts</b>	Video configuration fails External ROM module fails a checksum test

The following table lists other fatal error and their associated beep codes.

*Each code represents the number of short beeps that are grouped together.*

Fatal errors (errors that lock up the computer) are generally the result of a failed main logic board or some other add-on component (SIMM, BIOS, computer battery, etc.).

<b>BeepCode</b>	<b>Error</b>
<b>2-2-3</b>	BIOS ROM checksum
<b>3-1-1</b>	Test DRAM refresh
<b>3-1-3</b>	Test keyboard controller
<b>3-4-1</b>	Test 512K base address lines
<b>3-4-3</b>	Test 512K base memory
<b>2-1-2-3</b>	Check ROM copyright notice
<b>2-2-3-1</b>	Test for unexpected interrupts

## POST and Boot Messages

The POST displays messages to alert to errors in hardware, software and firmware or to provide operating information about the computer.

Each time the POST displays a message on the screen, the computer's speaker beeps twice. If an error occurs before the monitor is initialised, specific beep codes sound to alert to a problem. The following table lists a general grouping of system messages. In addition, each message is accompanied by text describing the message and in most cases, a recommended solution to the problem.

---

**NOTE**     *Italics* indicate variable parts of a message such as memory addresses, hexadecimal values and so on.

These messages can differ at each occurrence.

---



**POST and Boot Messages** (continued)

<b>Message</b>	<b>Description/Solution</b>
<b>nnnn Cache SRAM Passed</b>	Where <i>nnnn</i> is the amount of computer cache (in kilobytes) that tested successfully.
<b>Diskette drive A error Diskette drive B error</b>	Run the BIOS Setup Utility. Check all connections. If the problem persists replace the diskette drive.
<b>Entering SETUP</b>	BIOS Setup Utility runs.
<b>Extended RAM Failed at offset: nnnn</b>	Extended memory failed or configured incorrectly. Make sure SIMMs are installed correctly. If the problem persists replace the defective RAM. Run the BIOS Setup utility and restore all settings to original values.
<b>nnnn Extended RAM Passed</b>	Where <i>nnnn</i> is the amount of extended memory (in kilobytes) that tested successfully.
<b>Failing Bits: nnnn</b>	<i>nnnn</i> is a map of the bits at the RAM address which failed the memory test. Run the BIOS Setup Utility and restore all settings to original values.
<b>Fixed Disk 1 Failure Fixed Disk Controller failure</b>	Run the BIOS Setup Utility. Check all connections. If the problem persists, contact the DIGITAL SERVICE REPRESENTATIVE.
<b>Incorrect Drive A type - run SETUP</b>	Diskette drive A and/or B not correctly identified in the BIOS Setup utility.
<b>Incorrect Drive B type - run SETUP</b>	Run the BIOS Setup Utility and properly identify diskette drive A and/or B.
<b>Invalid NVRAM media type</b>	NVRAM access failed. Run the BIOS Setup Utility and restore all settings to original values. If the problem persists replace the defective component.
<b>Keyboard controller error Keyboard error Keyboard locked - Unlock key switch</b>	Check the keyboard connection. If the connection is secure the keyboard or keyboard controller might have failed. If the problem persists replace the defective component.
<b>Monitor type does not match CMOS - Run SETUP</b>	Run the BIOS Setup utility and set the correct monitor type.
<b>Operating system not found</b>	The operating system cannot be found on drive A or drive C. Run the BIOS Setup Utility and correctly identify drive A or drive C. Correctly install the operating system. Refer to the supplied operating system documentation.
<b>Parity check 1 nnnn</b>	Parity error found in the computer bus. The BIOS attempts to locate the address and display it on the monitor screen.
<b>Parity check 2 nnnn</b>	Run the BIOS Setup Utility and restore all settings to original values. If the problem persists replace the defective component.
<b>Press &lt;F1&gt; to resume, &lt;F2&gt; to Setup</b>	This message appears after any recoverable error message. Press <F1> to reboot or <F2> to enter the BIOS Setup utility to make any necessary changes.
<b>Real time clock error</b>	Real-time clock failed BIOS test. Replace the battery and then run the BIOS Setup Utility to restore previous configuration information.
<b>Shadow RAM Failed at offset:</b>	Shadow RAM failed.

<i>nnnn</i>	Run the BIOS Setup Utility and disable failed shadow memory region.
-------------	---

**POST and Boot Messages** (continued)

<b>Message</b>	<b>Description/Solution</b>
<b><i>nnnn</i> Shadow RAM passed</b>	Where <i>nnnn</i> is the amount of shadow RAM (in kilobytes) that tested successfully.
<b>System battery is dead Replace and run SETUP</b>	Replace the battery and then run the BIOS Setup utility to restore previous configuration information.
<b>System BIOS shadowed</b>	This indicates that the computers BIOS was successfully copied to shadow RAM.
<b>System cache error - Cache disabled</b>	RAM cache failed. Run the BIOS Setup Utility and restore all settings to original values. If the problem persists replace the defective component
<b>System CMOS checksum bad - run SETUP</b>	Run the BIOS Setup Utility and ensure that all settings are correct. Save the configuration even when no changes are made. If the problem persists replace the defective component.
<b>System RAM failed at offset: <i>nnnn</i></b>	System RAM failed. Run the BIOS Setup Utility and restore all settings to original values. If the problem persists replace the defective component.
<b><i>nnnn</i> System RAM passed</b>	Where <i>nnnn</i> is the amount of system RAM (in kilobytes) that tested successfully.
<b>System timer error</b>	The computers timer test failed. Run the BIOS Setup Utility and restore all settings to original values. If the problem persists replace the defective component.
<b>UMB upper limit segment address: <i>nnnn</i></b>	Displays the address of the upper limit of UMB. This indicates the released segments of the BIOS that can be reclaimed by a virtual memory manager.
<b>Video BIOS shadowed</b>	This indicates that the computers video BIOS was successfully copied to shadow RAM.

**Computer Troubleshooting**

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
<b>No response when the computer is turned on</b>	Main logic board failure.	Replace main logic board.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers (Refer to “ <i>Main logic board jumpers</i> ”).
	CPU has failed.	Replace CPU.

**Computer Troubleshooting** (continued)

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
<b>Power is on, but there is no screen display</b>	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	The monitor-off timer has shut the monitor off.	Press [Shift] to reactivate monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect VGA drivers installed.	Install the correct VGA drivers. Refer to <i>"Utilities &amp; Video Drivers"</i> .
	Video controller has failed.	Replace the video controller.
<b>Computer operates incorrectly after installing optional expansion board</b>	Expansion board installed incorrectly.	Remove expansion board and reinstall.
	Expansion board has failed.	Remove expansion board and reboot. If computer boots without errors, replace expansion board.
<b>Computer operates incorrectly after installing optional SIMMs</b>	Did not rerun BIOS Setup utility.	Rerun BIOS Setup utility.
	BIOS Setup utility changes not saved before exiting.	Rerun BIOS Setup utility and save changes. Remove SIMMs and reinstall. Make sure banks 1 and 2 are filled with the correct SIMM size, speed and type.
	SIMMs have failed.	Replace SIMMs.
<b>Computer operates incorrectly after installing optional external cache module</b>	External cache module installed incorrectly.	Remove external cache module and reinstall.
	External cache module has failed.	Replace external cache module.
<b>Computer fails to retain setup information</b>	Computer battery has failed.	Replace computer battery.

**Computer Troubleshooting** (continued)

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
<b>Computer does not boot from an IDE hard disk drive</b>	Operating system software is not installed on the IDE hard disk drive.	Install the appropriate operating system.
	IDE hard disk drive is not correctly formatted or the requested partition does not exist.	Format the IDE hard disk drive or partition the IDE hard disk drive using the supplied operating system software.  Install software on the requested partition.
	There is no software on the requested partition.	Refer to the supplied IDE hard disk drive kit installation instructions.
	IDE hard disk drive jumpers incorrectly set.	Run the BIOS Setup utility to identify the correct drive type.
	IDE drive type incorrect.	Secure all cable connections.
	Loose cables.	Run the BIOS Setup utility and set the IDE controller option to "Enabled".
	Onboard IDE interface disabled.	Connect the boot disk to the inner IDE connector on the main logic board.
	IDE hard disk is connected to the wrong IDE connector.	Run appropriate software to detect and remove viruses. (F-PROT recommended).
There might be a boot sector virus.	For DOS, boot from a DOS diskette then enter the following commands: <b>c:</b> <b>cd\dos</b> <b>fdisk/mbr.</b>	
Hard disk boot sector is missing.		
<b>Computer does not boot from a target diskette drive</b>	Diskette drive not enabled.	Run the BIOS Setup utility to enable the diskette drive.
	Diskette boot option disabled.	Run the BIOS Setup utility and set the proper boot sequence.
	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller option to "Enabled".
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.

**Computer Troubleshooting** (continued)

<b><i>Problem</i></b>	<b><i>Possible Cause</i></b>	<b><i>Action</i></b>
<b>No response to keyboard commands</b>	Keyboard is password protected.	Enter the keyboard password.
	Keyboard is connected to the mouse port.	Power down the computer and connect the keyboard to the keyboard port.
<b>No response to mouse commands</b>	Mouse is password protected.	Enter the keyboard and mouse password.
	Mouse is connected to the keyboard port.	Power down the computer and connect the mouse to the mouse port.
	Mouse driver not installed.	Install the appropriate mouse driver.

**Disk Drive Troubleshooting**

<b><i>Problem</i></b>	<b><i>Possible Cause</i></b>	<b><i>Action</i></b>
<b>IDE hard disk drive cannot read or write information</b>	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	IDE drive type incorrect.	Run the BIOS Setup utility to identify the correct drive type.
	Onboard IDE interface disabled.	Run the BIOS Setup utility and set the IDE controller option to "Enabled".
	IDE hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
<b>Target diskette drive cannot read or write information</b>	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller to "Enabled".
	Diskette write protection is enabled.	Run the BIOS Setup utility and set the diskette write protection to "Disabled".

**Monitor Troubleshooting**

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
<b>Monitor power indicator is not on</b>	Monitor is turned off.	Turn on the monitor.
	Power indicator is defective.	Replace the failed component.
<b>No screen display</b>	Configuration error.	Run the BIOS SETUP UTILITY to configure the computer for VGA operation. Set the jumper for VGA operation. " <i>Main Logic Board Jumpers</i> ".
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
<b>No monitor display while loading Windows video drivers</b>	Monitor type incorrectly set.	Set the correct monitor type. Refer to appropriate video driver documentation.
<b>Distorted, rolling / or flickering screen display- or wrong/uneven color</b>	Monitor incorrectly adjusted.	Adjust accordingly.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect.
<b>Color monitor displaying monochrome</b>	Computer was turned on before the monitor was turned on.	Turn off the computer, turn on the monitor, then turn the computer back on.
	Video jumper incorrectly set.	Set the jumper for VGA operation.
<b>Monitor fails to switch to high-resolution mode</b>	Appropriate high-resolution video drivers are not installed or incorrectly installed.	Correctly install all appropriate high-resolution video drivers. Refer to the documentation supplied with the monitor and/or video drivers.
<b>Monitor display not centered while loading Windows video drivers</b>	Monitor type incorrectly set.	Set the correct monitor type. Refer to appropriate video driver documentation.

## QAPlus/FE Error Messages

<b>Component</b>	<b>Messages</b>	<b>Solution</b>
<b>CPU</b>	Arithmetic Function Failed General Functions Failed Exception Interrupt in Protected Mode Refresh Failure Logic Functions Failed	Reset CPU Replace CPU
<b>Hard disk</b>	Butterfly Cylinder Access Test Failed Cylinder 0 Errors Random Cylinder Access Failed Linear Cylinder Access Failed	Low-level format hard disk Replace disk
<b>Hard drive/controller</b>	Controller Diagnostic Test Failed  Questionable Controller Card  Hard drives failed	Run Setup, Check connections  Reset controller, Replace controller  Replace disk
<b>Floppy diskette</b>	Media Mismatch  Drive Not Ready  Write Protected Media  Unformatted Media	Use known good diskette  Check size and density of diskette Close drive door  Remove write protection  Format diskette
<b>Floppy drive</b>	Floppy Drives Failed	Check connections, Replace drive
<b>Battery/clock</b>	Clock Stopped Invalid Date RTC Interrupt Failed	Run Setup Replace battery/clock
<b>CMOS</b>	CMOS Clock Test Failed	Change time from Setup menu in QAPLUS
<b>Serial port</b>	COM port failed  Serial Chip Error  Serial Compare Error  Serial Timeout Error	Check COM device  Check connections  Replace COM device  Replace COM device
<b>Video adapter</b>	Video Failed  Error in Video Buffer	Replace video adapter  Replace video adapter



## Chapter 5

## Device Mapping

This section provides a series of tables listing mapping and address information related to computer memory and various main logic board devices (keyboard controller, interrupt controller, DMA controller, etc.).

The computer's memory and address locations are allocated at the factory to operate within a standard PC environment. However, due to the number of optional devices and/or expansion boards that are available, sometimes memory and address locations need to be changed. For example, some network expansion boards require a specific memory location. If that location is already allocated, a memory conflict results and the expansion board will not operate as expected. Note that some memory, I/O and interrupt locations can be changed using the BIOS Setup utility.



### CAUTION

Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board or software application and make sure adequate information is available.

### CPU Memory Address Map (Full Range)

<i>Range</i>	<i>Function</i>	<i>Notes</i>
<b>0 KB to 640 KB</b>	Main memory	PC compatibility range
<b>640 KB to 1024 KB</b>	Main memory	PC compatibility range (ISA memory lower limit)
<b>1 MB to 16 MB</b>	Main memory Memory space gap	ISA memory upper limit
<b>16 MB to 68 MB</b>	Main memory	Computer memory upper limit

**I/O Address Map**

<b>Range (hexadecimal)</b>	<b>Function</b>
000 - 00F	DMA controller one
020 - 021	Interrupt controller one
022	Index register
023	Data register
040 - 043	Interval timer
060 - 06F	Keyboard controller
070 - 07F	Real-time clock (RTC), NMI
080 - 08F	DMA page register
0A0 - 0A1	Interrupt controller two
0C0 - 0CF	DMA controller two
0F0	Clear math co-processor busy
0F1	Reset math co-processor
0F8 - 0FF	Math co-processor
170 - 177	Secondary IDE controller
1F0 - 1F7	Primary IDE controller
278 - 27A	LPT2
2E8 - 2EF	COM4
2F8 - 2FF	COM2
378 - 37A	LPT1
3BC - 3BE	LPT3
3E8 - 3EF	COM3
3F0 - 3F7	Diskette controller
3F6 - 3F7	Primary IDE controller (alt status, device address)
3F8 - 3FF	COM1
3B0 - 3DF	VGA register
46E8	VGA enable register
42E8, 4AE8, 82EA, 82E8, 8AEA, 8EEA, 8AE8, 8EE8, 92EA, 96EA, 92E8, 96E8, 9AEA, 9AE8, 9EE8, A2E8, A6E8, AAE8, AAE8, B2E8, B6E8, BAE8, BEE8, E2E8, E2EA, EAE8, EAEA	VGA enhanced mode registers

**Computer Interrupt Levels**

<i>Interrupt Number</i>	<i>Interrupt Source</i>
<b>IRQ0</b>	Timer tick
<b>IRQ1</b>	Keyboard controller
<b>IRQ2</b>	Cascade interrupt
<b>IRQ3</b>	COM2, COM4 (if enabled)
<b>IRQ4</b>	COM1, COM3-modem
<b>IRQ5</b>	Sound card function
<b>IRQ6</b>	Diskette drive (if enabled)
<b>IRQ7</b>	LPT1
<b>IRQ8</b>	RTC
<b>IRQ9</b>	Recommended for optional video card
<b>IRQ10</b>	Recommended alternate for COM3
<b>IRQ11</b>	Recommended for network card
<b>IRQ12</b>	Mouse port (onboard)
<b>IRQ13</b>	Math co-processor
<b>IRQ14</b>	IDE primary
<b>IRQ15</b>	IDE secondary (if enabled)

**DMA Channel Assignment**

<i>Channel</i>	<i>Controller</i>	<i>Function</i>
<b>0</b>	<b>1</b>	Refresh
<b>1</b>	<b>1</b>	Sound card function
<b>2</b>	<b>1</b>	Diskette controller (if enabled)
<b>3</b>	<b>1</b>	Not used
<b>4</b>	<b>2</b>	Cascade DMA
<b>5</b>	<b>2</b>	Not used
<b>6</b>	<b>2</b>	Not used
<b>7</b>	<b>2</b>	Not used



## Chapter 6

## Pass / Fail Criteria

As Final Acceptance Test the following tests should be run to meet the Pass/Fail criteria:

- 1) **Successful completion of the POST tests.**
- 2) **Successful completion of the following QAPLUS/fe module tests (one pass):**
  - ◆ System Board (All Tests)
  - ◆ Memory (All Tests)
  - ◆ Video (All Tests)
  - ◆ Hard Disk (All Tests, **except: Sequential write/read (destructive test !!)**  
**Sequential write/random read (destructive test !!)**)
  - ◆ Floppy Disk (All Tests)
  - ◆ Keyboard (All Tests)
  - ◆ COM Ports (All Tests)
  - ◆ LPT Ports (All Tests)
  - ◆ Pointer device (All Tests)
- 3) **Successful bootstrap of the on the computer installed Operating System.**
  - Operating Systems Supported:
    - ◇ MS-DOS version 6.22 and earlier
    - ◇ OS/2 version 3.0 and earlier
    - ◇ Windows for Workgroups 3.11 and earlier
    - ◇ Windows NT Client
    - ◇ Windows 95
    - ◇ SCO UNIX System V release 3.2.4 and earlier
    - ◇ Novell Netware 3.12 and 4.1 and earlier

Remove any software that was put on the hard drive to enable repair of the system before shipping.

When completed carefully clean outside of unit with cleaning solution.



## Appendix A

## Service Notes

This appendix contains the current *Service Notes* for the *STARION 200/300* product line.





## Appendix B

## Useful Information

### Related documentation

<i>Description</i>	<i>Order Number</i>
STARION 200/300 PC Family Quick Reference Guide	EK-A0854-RG
STARION 200/300 Documentation Map	ER-901AA-MA
STARION 200/300 Quick Setup	ER-901WW-IA
STARION 200/300 User's Guide	ER-901WW-UA
STARION Promodem Audioprive Installation Guide	ER-90FMS-IA
SMM Spare Parts Catalogue STARION PC Family	EK-A0860-SV

### On-Line Bulletin Boards

The most current product information and technical support is also available on line. The most current device drivers, Setup diskettes and technical tips can be found on all of these bulletin boards.

◆ *DECpc Bulletin Board Server*

DECpc BBS provides an easy-to-use, menu-driven bulletin board providing on-line access to the latest PC product information, device drivers, shareware and freeware.

For access to the DECpc BBS, dial: **1 - 508 - 496 - 8800**.

◆ *CompuServe*

Digital hosts a number of conferences on CompuServe featuring a wide range of topics.

Enter **GO DEC** to reach Digital's main menu page.

For information on PC integration, enter: **GO DEC PCI**.



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## Personal Notes

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Is the documentation understandable, usable and sufficient for your needs? What material is missing?

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