AlphaStation 200 4/100

mach64 Graphics Accelerator Installation Guide

This document is a guide for installing the mach64 (PB2GA-FA/FN/FV) graphics option in Digital AlphaStation 200 4/100 systems.

1.0   Overview

This document is a guide for installing the mach64 (PB2GA-FA/FN/FV) graphics option in Digital AlphaStation 200 4/100 systems. If the particular system platform in use is not covered herein, please contact Digital at 800-DIGITAL (800-344-4825) for technical assistance.

2.0   General Description

The mach64 graphics accelerator is a single-slot PCI-bus graphics option for use in Digital's AlphaStation 200 4/100 computers. The 2 MByte DRAM accelerator supports a range of resolutions and flicker-free refresh rates up to 80 Hz. Resolution and refresh rate combinations vary depending upon operating system. Please refer to specific sections below for additional details.

3.0   Specifications

Below is a list of general specifications relative to the mach64 graphics accelerator.

> *System requirements: AlphaStation 200 4/100*
>
> *Monitors supported: VRC15, VRT17, VRC21, or hi-res RGB multi-sync*
>
> *Display memory: 2 MByte DRAM*
>
> *I/O addresses used: 102, 1CE, 1CF, 2E8, 2EC-2EF, 3D4, 3D5, 3D8-3DB,*
>
> *3C0-3CA, 3CC, 3CE-3CF, 3DC, and all aliases; 46E8*
>
> *Video output connector: 15-pin D shell (female)*
>
> *VGA feature connector: 26-pin header, VGA output only, VESA std.*
>
> *Sync signals: separate horizontal and vertical sync at TTL levels*
>
> *Power: +5V ±5%, @ 1.3A typical*
>
> *Ambient temperature: 50 to 122 deg. F (10 to 50 deg. C) in operation*
>
> *32 to 162 deg. F (0 to 70 deg. C) in storage*

Relative humidity: 5% to 90% non-condensing in operation

0% to 95% in storage

MTBF: 120,000 hours.

4.0　　Configuration Options

Jumper (JU10) is the only manually selectable option on the card. The mach64 can request and be allocated hardware interrupt resources by the system. The request for such interrupt resources can be enabled or disabled by removing or installing the jumper JU10 on the card. The factory default is jumper installed at JU10 to disable interrupt request. This jumper should be in place when using this card in AlphaStation 200 4/100 platforms.

_____**Note**_____

Certain PCI options, including the mach64, have been observed to generate invalid parity under certain PCI-bus loading conditions. Please ensure that your specific configuration will operate without system errors prior to turning on PCI parity checking.

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5.0　　Hardware Installation

Before installing this option in a Windows NT system, please refer to conditions outlined in the Windows NT Installation Procedure within section 5.2.

To ensure successful installation, please follow the initial instructions below:

1. Use a grounding strap when handling the card to eliminate damaging electrostatic discharge.

2. Remove the cover from the system enclosure.

3. Carefully insert, seat and properly secure the card in a free PCI slot.

4. Replace the cover of the system enclosure.

5. Properly secure the RGB and sync cable connections.

6. Turn on the power to the monitor.

7. Turn on the power to the system (Note: auto-boot must be disabled).

The mach64 option automatically boots to the console level in VGA text mode ("blue screen"). If the display remains black (no video) for more than a minute, re-check all criteria listed above. If the option still does not produce a display, the system may have an incompatible firmware revision level on the system. Contact Digital field service for technical assistance.

5.1 DEC OSF/1 Installation Procedure

Below are the characteristics of the PB2GA-FA option for DEC OSF/1 systems.

Firmware requirements: SRM x3.9-1387 or higher

Operating system requirements: DEC OSF/1 V3.2 or higher

Resolutions supported:	*Display*	*Vert. Freq.*	*Pixel Freq.*
	640x480	*72 Hz*	*31.5 MHz*
	800x600	*72 Hz*	*50 MHz*
	1024x768	*70 Hz*	*75 MHz*
	1280x1024	*66 Hz*	*119 Mhz*

_____**Note**_____

Once the DEC OSF/1 system is powered on, the mach64 runs in VGA text mode as a terminal device. If a graphics option other that the mach64 (e.g., ZLXp) was previously running in the system, be advised that X/Motif cannot be started until the OS kernel has been reconfigured.

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With the mach64 installed, the following procedure applies:

1. Reboot using "genvmunix":
   > *boot -fi "/genvmunix"*

2. Log in as a "superuser" with full privileges.

3. Copy the "vmunix" file within root to a backup file:
   > *cp /vmunix /vmunix.sav*

4. Run the "doconfig" program from /usr/sbin/ to create a new kernel file. For additional details on reconfiguring the kernel, please refer to the Guide to System Administration (#AAPS2RA-TE).

5. Move the new "vmunix" kernel file (location reported during doconfig) to "vmunix". This will overwrite the old kernel file.

   mv /sys/<SYSTEM_NAME>/vmunix /vmunix

6. Perform a shutdown with automatic reboot:

   shutdown -r now

7. Upon rebooting, the operating system automatically detects the presence of the mach64 and defaults to the 1024 x 768 display resolution mode.

Changing OSF/1 Display Characteristics

To change to any one of the other supported resolution and refresh modes, continue with the following steps:

1. Change directory to /var/X11/xdm. Execute the command:

   chmod +x Xservers

2. Edit the "Xservers" file.

   vi Xservers

3. At the end of the line that reads ":0 local /usr/bin/X11/X -nice -2 ...", remove any parameters appearing after the "-2" and append one of the following declarations:

   -screen0 640, or
   -screen0 800, or
   -screen0 1024, or   * default setting
   -screen0 1280

   Example: *:0 local /usr/bin/X11/X -nice -2 -screen0 1280*

4. When editing is complete, save and perform a shutdown with automatic reboot for changes to take effect:

   shutdown -r now

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5.2   Windows NT Installation Procedure

Below are the characteristics of the PB2GA-FN option for Windows NT systems.

Firmware requirements: ARC 3.5-19 or higher

Operating system requirements: Windows NT V3.5, build 807 or higher

Resolutions supported:	*Display*	*Colors*	*Vert. Freq*
	640x480	*16, 256, 65k, 16M*	*60, 72*
	800x600	*16, 256, 65k, 16M*	*56, 60, 70, 72*
	1024x768	*16, 256, 65k*	*60, 66, 70, 72*
	1152x864	*16, 256*	*60, 70, 75, 80*
	1152x864	*65k*	*60*
	1280x1024	*16, 256*	*60, 70, 74*

_____**Note**_____

If a graphics option other than the mach64 (e.g., S3 864, ZLXp) was previously operating in the system, it will be necessary to keep that graphics option installed in the system while changing over to the mach64 driver. If the previously installed graphics option is not available, it will be necessary to re-install Windows NT using the "Custom" procedure outlined in section 5.2.2.

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After logging on with the previously installed graphics option in the system, the following procedure applies:

1. To install the mach64 graphics driver from Windows NT, double-click on the Display icon within the Control Panel and go through the following procedure:
    > *Change Display Type... ,*
    > *Change... ,*
    > *Other...*

2. Load the mach64 Windows NT driver diskette in drive A:\ and press the "OK" button. Select the "ATI Graphics Accelerators" option and press "Install". Continue to follow the on-screen instructions. If difficulty is experienced, please refer to the Windows NT user's guide for information on changing graphics drivers.

3. At the end of the driver installation process a dialog box will appear. Press the "Restart Now" button to invoke a shutdown and reboot process.

4. When the display goes to the ARC Multiboot "blue screen" it is safe to turn off system power and install the mach64 graphics option as outlined in section 5.0.

5. Upon rebooting the new driver will be loaded and the mach64 comes up in 640 x 480 default mode.

5.2.1 Changing Windows NT Display Characteristics

To change display resolution and refresh from the Windows NT Control Panel, the following procedure applies:

1. Double-click on the Display icon in the Control Panel and go through the following process:
    > *List All Modes...*

2. Make a selection from the list of supported display modes and go through the following process:
    > *OK*
    > *Test*
    > *OK*

The testing operation will confirm that the monitor properly synchronizes in the selected mode. (Note: If the monitor synchronizes but the display appears geometrically distorted, it will be necessary to adjust the monitor's geometry controls after rebooting).

3. If the test bitmap was properly displayed, continue to respond affirmatively to the dialog boxes and, when prompted, reboot by pressing:

Restart Now

4. Upon rebooting, the new display characteristics will be loaded and the mach64 comes up in the newly selected display mode.

5.2.2 Custom Windows NT Installation Procedure

If the previously installed graphics option was not available, it will be necessary to re-install Windows NT using the "Custom" procedure. With the mach64 installed in the system, the following procedure applies:

1. From the ARC Multiboot "blue screen" menu, index down to "Supplementary Menu...". Then index down to "Install Windows NT from CD-ROM". Within the Windows NT Workstation Setup process the system queries for either "Express Setup" or "Custom Setup" installation. Press "C" for custom installation. If difficulty is experienced, please refer to the Windows NT installation guide for additional guidance.

2. Early in the Custom Setup process the program queries for either a "New Version" or an "Upgrade". Press the "N" to select "New Version". A list of hardware and software components is then displayed. Once this list is displayed, simply scroll up to the "Display" field and press <Return>.

   Ensure that the mach64 driver diskette is in the floppy drive. Index down to the "Other" option and follow the on-screen instructions. When queried, select the "ATI Graphics Accelerators" option and press <Return>. Press <Return> again to continue. Continue with the Windows NT installation process by following the on-screen instructions.

   Note: Toward the end of the first half of the Windows NT Setup process an automatic reboot is invoked. Setup will then continue in graphical mode. If any difficulty is experienced, please refer to the Windows NT installation guide for additional guidance.

3. Toward the end of the last half of the Windows NT Setup process, after the point where the system clock is set, a dialog box will appear acknowledging the presence of the ATI Technologies mach64 graphics accelerator. Press "OK" to proceed and select the "List all modes..." option. Set up a new default display mode using the standard procedure outlined in section 5.2.1.

4. Upon rebooting Windows NT, the new display characteristics will be loaded and the mach64 comes up in the selected display mode.

Note: When updating from an older to newer version of the mach64 driver, it may be necessary to perform a cold reboot process in order to load the new ATI.DLL file.

5.3   OpenVMS Installation Procedure

Below are the characteristics of the PB2GA-FV option for OpenVMS systems.

Firmware requirements: SRM x3.9-1387 or higher

Operating system requirements : OpenVMS V6.1-1-H2 or higher (mach64 kit required)

Resolutions supported:	*Display*	*Vert. Freq.*	*Pixel Freq.*
	640x480	*72 Hz*	*31.5 MHz*
	800x600	*72 Hz*	*50 MHz*
	1024x768	*70 Hz*	*75 MHz*
	1280x1024	*66 Hz*	*119 MHz*

_____**Note**_____

When the OpenVMS system is powered on, the mach64 runs in VGA text mode as a terminal device. Be advised that Motif cannot be started until the following procedure has been completed.

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1.   Log into the system account from the graphics head or serial terminal.

2.   Mount the OpenVMS support diskette that accompanies the mach64 option.
                  mount dva0: /over=id

3.   Invoke the VMSINSTAL procedure.
                  @sys$update:vmsinstal axpgup01_061 dva0:

4.   Proceed by following the simple on-screen instructions. When done, this procedure forces a shutdown and reboot.

5.   When rebooting, the operating system automatically detects the presence of the mach64 and defaults to the 1024 x 768 display resolution mode. (Note: During reboot the system display may momentarily appear somewhat distorted. This condition will correct itself once the DECwindows server comes up.)

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Changing OpenVMS Display Characteristics

To change to any one of the other supported resolution and refresh modes, such as 1280x1024, the following procedure applies:

1. Copy the DECwindows server setup template to a ".com" file:
        copy sys$manager:decw$private_server_setup.template   to file...
        sys$manager:decw$private_server_setup.com

2. Edit "sys$manager:decw$private_server_setup.com" and add the appropriate lines under the "FINAL SET ENTRY" label:
        $ decw$xsize_in_pixels == 1280
        $ decw$ysize_in_pixels == 1024
        $ define/system DECW$SERVER_FIFO_LOW_WATER_MARK 8

    Note: Please refer to the mach64 OpenVMS release notes for "LOW_WATER_MARK" settings for other supported resolutions.

3. Save changes and invoke a shutdown and reboot process for the changes to take effect.
        @sys$system:shutdown

    Continue using the defaults until prompted to reboot. Press "Y" to reboot.

4. Upon rebooting OpenVMS, the new display characteristics are loaded and the mach64 comes up in the newly selected display mode. (Note: During reboot the system display may momentarily dim. This condition will correct itself once the DECwindows server comes up.)

6.0   Technical Assistance

For additional documentation call 800-DIGITAL (800-344-4825) and press 2 for technical assistance.

7.0   FCC Compliance Statement

Note: This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and

- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

WARNING!

The use of shielded cables with external ferrite beads for connection of the monitor to the graphics card is required to assure compliance with FCC regulations.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.