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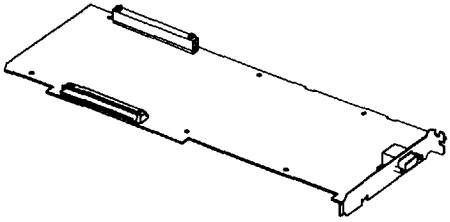
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Find the *Keysight / Agilent A4070B* at our website: ***Click HERE***

HCRX-8 Graphics Card (A4070A)

Upgrade Product—A4070A

For HP 9000 Models 715/64, 715/80, 715/100, and 725/100



HCRX-8 — 8-Plane Color Graphics Card

New P/N	A4070-66504
Exchange P/N	A4070-69504
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

HCRX-8 Frame-Buffer Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	8	2	8-plane single or 8/8 double
overlay	8	2	8-plane single

This card is an 8-plane with 8/8 double buffering enhanced 2D and 3D graphics processor that installs in HP Model 715/64, 715/80, 715/100, and 725/100 computers.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.) .

System Configuration

Modify the system software to support the graphics upgrade connector output:

1. In `root`, create a device file for the upgrade by entering:

   `/etc/mknod /dev/`⟨*new_device_name*⟩ `c 12 0x000000` Return

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Note The default address for the built-in graphics (`/dev/crt`) on HP Models 715/33, 715/50, 715/75, and 725/75 is `0x000000`.

The default address for the built-in graphics (`/dev/crt`) on HP Models 715/64, 715/80, 715/100, and 725/100 is `0x100000`. Please be aware of this change, especially with regard to system upgrades.

2. Set read/write permission (`chmod 666 /dev/`⟨*new_device_name*⟩ Return).
3. Include the graphics upgrade in the screenfile—edit `/usr/lib/X11/X0screens` to include the following:

   `/dev/`⟨*new_device_name*⟩

Boot Software Modification

1. After installation, ensure boot software points to the graphics upgrade connector as the preferred boot console. In `BOOT_ADMIN`, type:

   `path console graphics_`⟨*new_device_slot_number*⟩

Note For HP Models 715/64, 715/80, and 715/100, this *new_device_slot_number* is `1`.

For HP Model 725/100, this *new_device_slot_number* is `4`.

2. As `root`, reboot system using `/etc/reboot -h` (do not use HP VUE logout procedure).

grtest

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly. Device files for `grtest` should be set up as follows:

```
crw-rw-rw-   1 root     root       12 0x000000 Sep 30 09:36 ⟨new_device_name⟩
crw-rw-rw-   2 root     other      12 0x100000 Sep 30 09:37 crt
```

2. Preserve customer configuration file:

   `cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old`

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`⟨*new_device_name*⟩
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

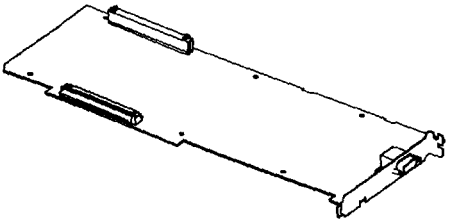
   `mv /usr/lib/X11/X0screens.old /usr/lib/X11/X0screens`

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HCRX-24 Graphics Card (A4071A)

Upgrade Product—A4071A

For HP 9000 Models 715/64, 715/80, 715/100 and 725/100



HCRX-24—24-Plane Color Graphics Card

New P/N	A4071-66507
Exchange P/N	A4071-69507
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

HCRX-24 Frame-Buffer Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	24	2	24-plane single or 12/12 double
overlay	8	2	8-plane single

This card is a 24-plane enhanced 2D and 3D graphics processor that installs in HP Model 715/64, 715/80, 715/100, and 725/100 computers.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.) .

System Configuration

Modify the system software to support the graphics upgrade connector output:

1. In `root`, create a device file for the upgrade by entering:

   `/etc/mknod /dev/`*⟨new_device_name⟩* `c 12 0x000000` Return

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Note The default address for the built-in graphics (`/dev/crt`) on HP Models 715/33, 715/50, 715/75, and 725/75 is `0x000000`.

The default address for the built-in graphics (`/dev/crt`) on HP Models 715/64, 715/80, 715/100, and 725/100 is `0x100000`. Please be aware of this change, especially with regard to system upgrades.

2. Set read/write permission (`chmod 666 /dev/`⟨*new_device_name*⟩ Return).
3. Include the graphics upgrade in the screenfile—edit `/usr/lib/X11/X0screens` to include the following:

   `/dev/`⟨*new_device_name*⟩

Boot Software Modification

1. After installation, ensure boot software points to the graphics upgrade connector as the preferred boot console. In `BOOT_ADMIN`, type:

   `path console graphics_`⟨*new_device_slot_number*⟩

Note For HP Models 715/64, 715/80, and 715/100, this *new_device_slot_number* is 1.

For HP Model 725/100, this *new_device_slot_number* is 4.

2. As `root`, reboot system using `/etc/reboot -h` (do not use HP VUE logout procedure).

grtest

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly. Device files for `grtest` should be set up as follows:

```
crw-rw-rw-   1 root     root       12 0x000000 Sep 30 09:36 ⟨new_device_name ⟩
crw-rw-rw-   2 root     other      12 0x100000 Sep 30 09:37 crt
```

2. Preserve customer configuration file:

   `cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old`

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`⟨*new_device_name*⟩
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

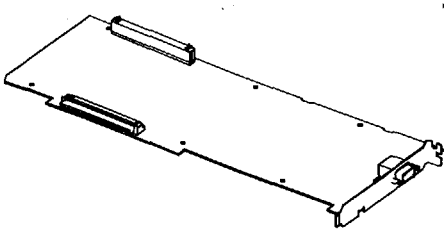
4. Restore customer's configuration file—execute:

   `mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens`

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8-Plane Frame Buffer Board (A4070B)

Upgrade Product—A4070B



8-Plane Frame Buffer Board

New P/N	A4070-66505
Exchange P/N	A4070-69505
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

8-Plane Frame Buffer Board Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	8	2	8-plane single or 8/8 double
overlay	8	2	8-plane single

This card is an 8-plane with 8/8 double buffering enhanced 2D and 3D graphics processor that installs in supported workstations.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

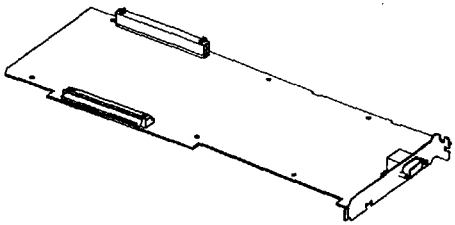
Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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24-Plane Frame Buffer Board (A4071B)

Upgrade Product—A4071B



24-Plane Frame Buffer Board

New P/N	A4071-66508
Exchange P/N	A4071-69508
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

24-Plane Frame Buffer Board Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	24	2	24-plane single or 12/12 double
overlay	8	2	8-plane single

This card is a 24-plane enhanced 2D and 3D graphics processor that installs in supported workstations.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

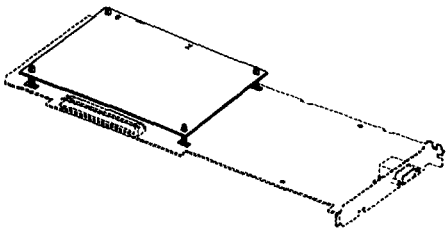
Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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HCRX Z-Buffer/Accelerator (HCRX-8Z & HCRX-24Z) (A4072A)

Upgrade Product—A4072A

For HP 9000 Models 715/64, 715/80, 715/100, and 725/100



HCRX Z-Buffer/Accelerator

New P/N	A4072-66512
Exchange P/N	A4072-69512
Standoffs P/N	0380-4081

This card provides acceleration and Z-buffering for HCRX-8 and HCRX-24 graphics processors. It mounts on the HCRX-8 or HCRX-24, which install in HP Model 715/64, 715/80, 715/100, and 725/100 computers.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.) .

System Configuration

Modify the system software to support the graphics upgrade connector output:

1. In `root`, create a device file for the upgrade by entering:

   `/etc/mknod /dev/`⟨*new_device_name*⟩ `c 12 0x000000` Return

Note

The default address for the built-in graphics (`/dev/crt`) on HP Models 715/33, 715/50, 715/75, and 725/75 is `0x000000`.

The default address for the built-in graphics (`/dev/crt`) on HP Models 715/64, 715/80, 715/100, and 725/100 is `0x100000`. Please be aware of this change, especially with regard to system upgrades.

2. Set read/write permission (`chmod 666 /dev/`⟨*new_device_name*⟩ Return).
3. Include the graphics upgrade in the screenfile—edit `/usr/lib/X11/X0screens` to include the following:

   `/dev/`⟨*new_device_name*⟩

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Boot Software Modification

1. After installation, ensure boot software points to the graphics upgrade connector as the preferred boot console. In `BOOT_ADMIN`, type:

   `path console graphics_`*(new_device_slot_number)*

Note For HP Models 715/64, 715/80, and 715/100, this *new_device_slot_number* is **1**.

For HP Model 725/100, this *new_device_slot_number* is **4**.

---

2. As `root`, reboot system using `/etc/reboot -h` (do not use HP VUE logout procedure).

grtest

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly. Device files for `grtest` should be set up as follows:

```
crw-rw-rw-   1 root      root       12 0x000000 Sep 30 09:36 (new_device_name )
crw-rw-rw-   2 root      other      12 0x100000 Sep 30 09:37 crt
```

2. Preserve customer configuration file:

   `cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old`

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`*(new_device_name)*
   `/dev/crt`

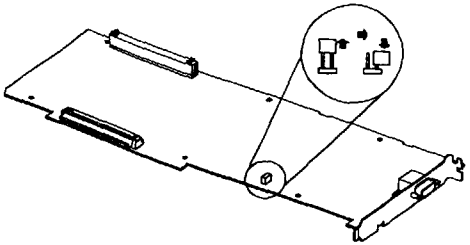
   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   `mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens`

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It may be to necessary to disable the stereo signal by removing the two-pin berg connector jumper (see illustration below) if a non-HP supported monitor is used. Remove the jumper by pulling it straight up off the two pins. The jumper can be placed on one pin for storage (see illustration below).



Removing the Jumper

grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   ```
   /dev/⟨new_device_name⟩
   /dev/crt
   ```

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
   ```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   ```
   /dev/⟨new_device_name⟩
   /dev/crt
   ```

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

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4. Restore customer's configuration file—execute:

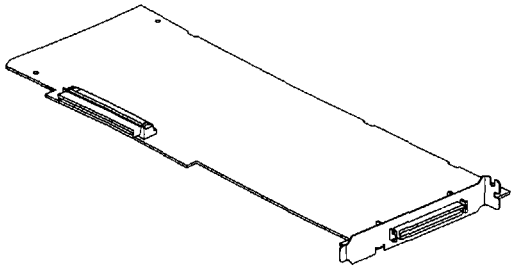
```
mv /usr/lib/X11/XOscreens.old  /usr/lib/X11/XOscreens
```


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GSC Interface Card (A4069A and A4073A)

Upgrade Product—A4073A

For HP 9000 Models 715/100 and 725/100



GSC Interface Card

New P/N	A4073-66001
Exchange P/N	A4073-69001
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

The A4069A is a kit that consists of:

one A4073A—GSC interface card in EISA form factor

AND

one A2091A—CRX-48Z graphics processor

For more information regarding the A2091A graphics processor, see the *HP A2091A Graphics Processor CE Handbook* (A2091-90039).

The A4073A is a stand-alone interface card that plugs into the GSC bus connector in the system processing unit (SPU) and serves as the interface between the SPU and the CRX-48Z.

There are, however, a total of three different types of interface cards for the CRX-48Z. Each type of interface card has a different form factor and/or bus connector that support particular workstations. Each type of interface card has its own installation procedure.

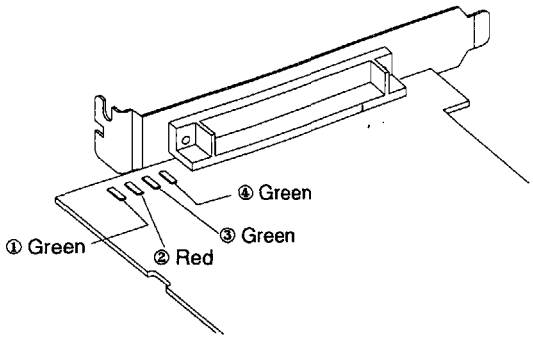
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The following table describes the interface card types, supported workstations, and part numbers for their respective installation guides:

Interface Card Type	Workstation Model	Installation Guide Part Number
Full Size SGC Form Factor	730, 735, 735/125, 750, 755	A2091-90601
EISA Form Factor for SGC Bus	715 725/75	A2675-90602 A2685-90610
EISA Form Factor for GSC Bus	715/100, 725/100	A4069-90010

Note HP Model 712, 715/64, and 715/80 computers are not supported with the CRX-48Z.

The following figure illustrates the location of the LEDs on the GSC interface card.



LED Location

LED Status	Meaning
No lights are on.	CRX-48Z is off or disconnected.
Number 2 (Red) is on.	CRX-48Z is on and connected, but no cycles to it yet.
All lights are on.	Normal operation.
Any other combination.	GSC interface card failure.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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System Configuration

Modify the system software to support the graphics upgrade connector output:

1. In `root`, create a device file for the upgrade by entering:

   `/etc/mknod /dev/`⟨*new_device_name*⟩ `c 12 0x000000` Return

Note The default address for the built-in graphics (`/dev/crt`) on HP Models 715/33, 715/50, 715/75, and 725/75 is `0x000000`.

The default address for the built-in graphics (`/dev/crt`) on HP Models 715/100 and 725/100 is `0x100000`. Please be aware of this change, especially with regard to system upgrades.

---

2. Set read/write permission (`chmod 666 /dev/`⟨*new_device_name*⟩ Return).
3. Include the graphics upgrade in the screenfile—edit `/usr/lib/X11/X0screens` to include:

   `/dev/`⟨*new_device_name*⟩

Boot Software Modification

1. After installation, ensure boot software points to the graphics upgrade connector as the preferred boot console. In `BOOT_ADMIN`, type:

   `path console graphics_`⟨*new_device_slot_number*⟩

Note For the HP Model 715/100 computer, this *new_device_slot_number* is `1`.

For the HP Model 725/100 computer, this *new_device_slot_number* is `4`.

---

2. As `root`, reboot system using `/etc/reboot -h` (do not use HP VUE logout procedure).

grtest

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly. Device files for `grtest` should be set up as follows:

```
crw-rw-rw-   1 root     root      12 0x000000 Sep 30 09:36 ⟨new_device_name⟩
crw-rw-rw-   2 root     other     12 0x100000 Sep 30 09:37 crt
```

2. Preserve customer configuration file:

   `cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old`

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`⟨*new_device_name*⟩
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

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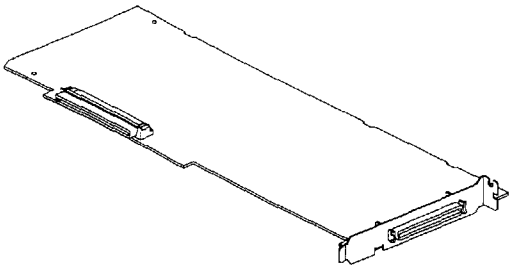
4. Restore customer's configuration file—execute:

```
mv /usr/lib/X11/XOscreens.old  /usr/lib/X11/XOscreens
```


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GSC Interface Card (A4073A) for the CRX-48Z (A4069A/A4074A)

Upgrade Product—A4073A or A4074A



CRX-48Z GSC Interface Card

New P/N	A4073-66001
Exchange P/N	A4073-69001
Flex Cable P/N	A4071-62001
Flex Cable Connector Lock P/N	A4071-40003
Bucket P/N	A4071-00002
Retainer P/N	A4071-40001

The A4069A and A4074A is a kit that consists of:

one A4073A—GSC interface card in EISA form factor

AND

one A2091A—CRX-48Z graphics processor

For more information regarding the A2091A graphics processor, see the *HP A2091A Graphics Processor CE Handbook* (A2091-90039).

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

The A4073A is a stand-alone interface card that plugs into the GSC bus connector in the system processing unit (SPU) and serves as the interface between the SPU and the CRX-48Z.

There are, however, a total of three different types of interface cards for the CRX-48Z. Each type of interface card has a different form factor and/or bus connector that support particular workstations. Each type of interface card has its own installation procedure.

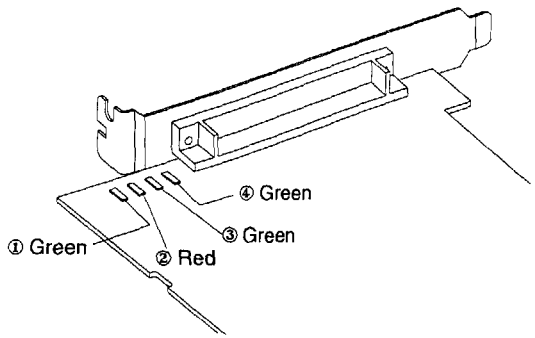
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The following table describes the interface card types, supported workstations, and part numbers for their respective installation guides:

Interface Card Type	Workstation Model	Installation Guide Part Number
Full Size SGC Form Factor	730, 735, 735/125, 750, 755	A2091-90601
EISA Form Factor for SGC Bus	715 725/75	A2675-90602 A2685-90610
EISA Form Factor for GSC Bus	715/80, 715/100, 725/100, J Series	A4070-90011

Note The HP Model 712 computer is not supported with the CRX-48Z.

The following figure illustrates the location of the LEDs on the GSC interface card.



LED Location

LED Status	Meaning
No lights are on.	CRX-48Z is off or disconnected.
Number 2 (Red) is on.	CRX-48Z is on and connected, but no cycles to it yet.
All lights are on.	Normal operation.
Any other combination.	GSC interface card failure.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/XOscreens /usr/lib/X11/XOscreens.old
   ```

3. Edit `/usr/lib/X11/XOscreens` to include:

   ```
   /dev/(new_device_name)
   /dev/crt
   ```

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/XOscreens.old  /usr/lib/X11/XOscreens
   ```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/XOscreens /usr/lib/X11/XOscreens.old
   ```

3. Edit `/usr/lib/X11/XOscreens` to include:

   ```
   /dev/(new_device_name)
   /dev/crt
   ```

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

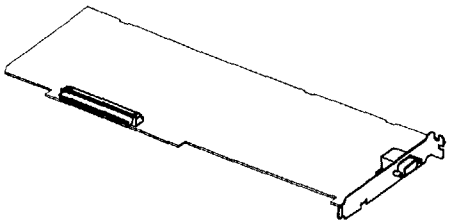
   ```
   mv /usr/lib/X11/XOscreens.old  /usr/lib/X11/XOscreens
   ```


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Color Graphics Card (A4077A)

Upgrade Product — A4077A

For HP 9000 Model 725/100



Color Graphics Card

New P/N A4081-66009
Exchange P/N A4081-69009

Color Graphics Card Frame-Buffer Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	8	1	8-plane single
overlay	0	NA	NA

This card allows the addition of a second graphics monitor to the HP Model 725/100 workstation.

Self-test in STI ROM reports to the screen and Series 700 front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

System Configuration

Modify the system software to support the Color Graphics Card connector output:

1. In `root`, create a device file for the upgrade by entering:

   `/etc/mknod /dev/`⟨*new_device_name*⟩ `c 12 0x000000` Return

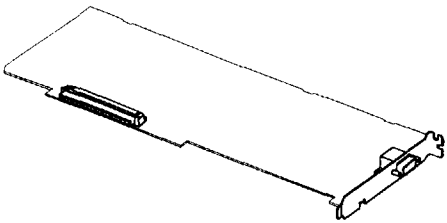
Note The default address for the built-in graphics (`/dev/crt`) on HP Model 725/75 is `0x000000`. The default address for the built-in graphics (`/dev/crt`) on HP Model 725/100 is `0x100000`. Please be aware of this change, especially with regard to system upgrades.

2. Set read/write permission (`chmod 666 /dev/`⟨*new_device_name*⟩ Return).

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Color Graphics Card (A4077A)

Upgrade Product — A4077A



Color Graphics Card

New P/N	A4081-66009
Exchange P/N	A4081-69009

Color Graphics Card Frame-Buffer Configuration

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	8	1	8-plane single
overlay	0	NA	NA

This card allows the addition of one graphics display to supported workstations.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/XOscreens /usr/lib/X11/XOscreens.old
   ```

3. Edit `/usr/lib/X11/XOscreens` to include:

   ```
   /dev/⟨new_device_name⟩
   /dev/crt
   ```


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Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

```
mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).

2. Preserve customer configuration file:

```
cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
```

3. Edit `/usr/lib/X11/X0screens` to include:

```
/dev/⟨new_device_name⟩
/dev/crt
```

Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

```
mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
```


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Dual Color Graphics Card (A4078A)

Upgrade Product — A4078A

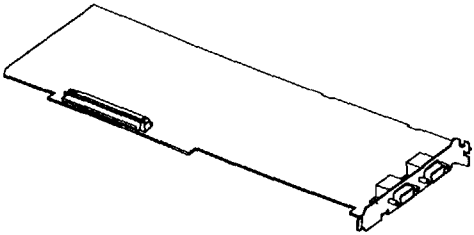


Figure 9-1. Dual Color Graphics Card

New P/N A4081-66005
Exchange P/N A4081-69005

The Dual Color Graphics Card contains two graphics processors. *Each* graphics processor has the following frame-buffer configuration:

Dual Color Graphics Card Frame-Buffer Configuration (Per Processor)

Plane Type	Plane Depth	Color Maps	Hardware Buffering
image	8	1	8-plane single
overlay	0	NA	NA

This card allows the addition of two graphics monitors to supported workstations.

Note Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and the system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root`.
2. Preserve customer configuration file:

   ```
   cp /etc/X11/X0screens /etc/X11/X0screens.old
   ```

3. Edit `/etc/X11/X0screens` to include:

   `/dev/`⟨*device_name1*⟩
   `/dev/`⟨*device_name2*⟩

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /etc/X11/X0screens.old  /etc/X11/X0screens
   ```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root`.
2. Preserve customer configuration file:

   ```
   cp /etc/X11/X0screens /etc/X11/X0screens.old
   ```

3. Edit `/etc/X11/X0screens` to include:

   `/dev/`⟨*device_name1*⟩
   `/dev/`⟨*device_name2*⟩

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

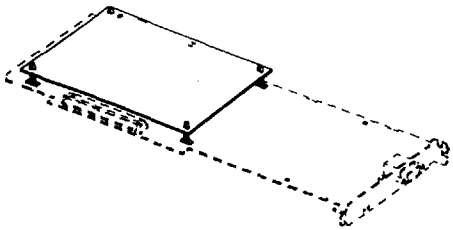
4. Restore customer's configuration file—execute:

   ```
   mv /etc/X11/X0screens.old  /etc/X11/X0screens
   ```


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Z-Buffer and Accelerator (A4242A) for 8-Plane and 24-Plane Frame Buffer Boards

Upgrade Product—A4242A



Z-Buffer and Accelerator for 8-Plane and 24-Plane Frame Buffer Boards

New P/N	A4242-66001
Exchange P/N	A4242-69001
Standoffs P/N	0380-4081

This card provides acceleration and Z-buffering for the 8-Plane Frame Buffer Board (A4070A/B) and 24-Plane Frame Buffer Board (A4071A/B). It mounts on the 8-Plane Frame Buffer Board or 24-Plane Frame Buffer Board, which is then installed into supported workstations.

Caution Ensure that connectors are properly aligned between the frame buffer board and accelerator, and that pressure is applied evenly during installation; otherwise, you may damage connector pins and/or surrounding board components.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   ```
   /dev/(new_device_name)
   /dev/crt
   ```


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Define the screens in this order. This allows **grtest** routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

```
mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
```

grtest for HP-UX 10.X

1. The **grtest** routine is located in **/usr/sbin/diag**. For **grtest** to execute properly, you must be logged in as **root** and set-up files must be configured properly (see *Graphics Administration Guide*).

2. Preserve customer configuration file:

```
cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
```

3. Edit **/usr/lib/X11/X0screens** to include:

```
/dev/⟨new_device_name⟩
/dev/crt
```

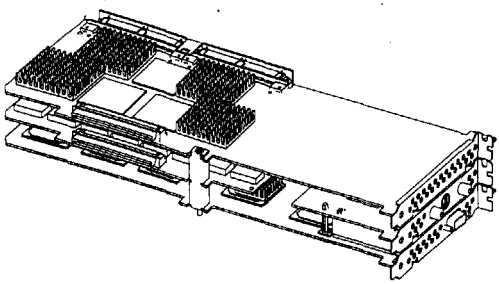
Define the screens in this order. This allows **grtest** routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

```
mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
```


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A4244A Graphics Option



A4244A Graphics Option

New Part Number	Description	Exchange Part Number
A4244-66001	Geometry Accelerator Board	A4244-69001
A4244-66002	Frame Buffer Board	A4244-69002
A4244-66003	Front Plane 3-Wide Board	N/A
A4244-66004	Front Plane 2-Wide Board	N/A
A4245-66001	Texture Mapping Board	A4245-69001
A4248-66001	Video Out Board	A4248-69001
A4244-00005	Retaining Clip for Front Plane 3-Wide	N/A
A4244-00007	Retaining Clip for Front Plane 2-Wide	N/A
A4244-00009	Board Placeholder	N/A
A4244-00011	End Retaining Clip, 2 per board	N/A
A4244-62001	Spacer and Screw Assembly (2-Wide)	N/A
A4244-62002	Spacer and Screw Assembly (3-Wide)	N/A
0380-4378	Standoffs	N/A

The A4244A Graphics Option is a 3D graphics subsystem consisting of a geometry accelerator and frame buffer board. There are also two optional products associated with the A4244A Graphics Option: a video out board and a texture mapping board.

Note The A4248A video out product requires additional software.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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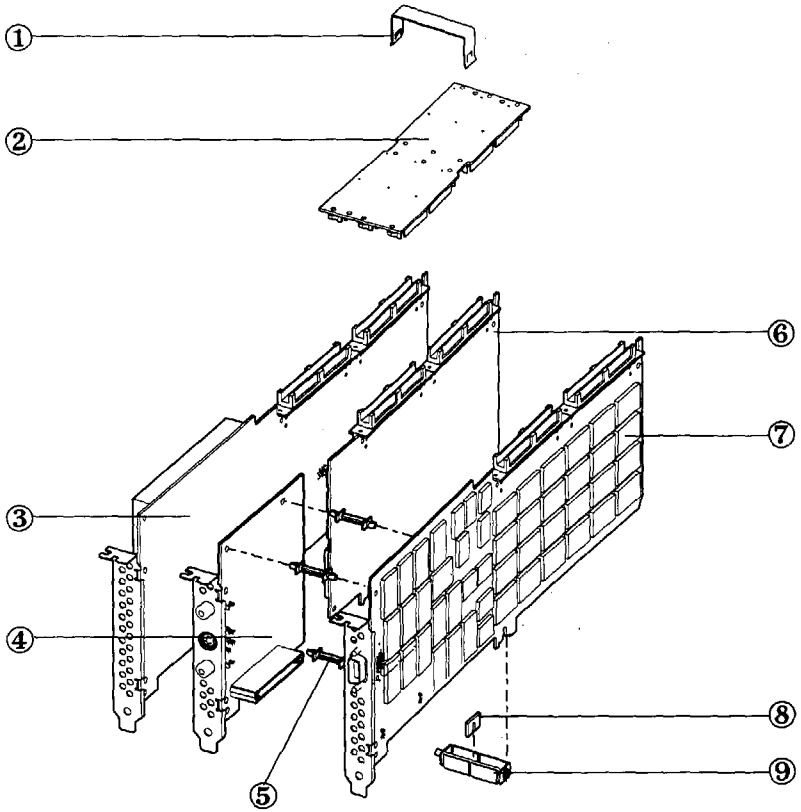


Figure 1-1. A4244A Graphics Option

1. Retaining Clip (2-Wide (not shown) or 3-Wide)
2. Front Plane (2-Wide (not shown) or 3-Wide)
3. Geometry Accelerator Board
4. Video Out Board (Optional)
5. Standoffs (Optional)
6. Texture Mapping Board (Optional)
7. Frame Buffer Board
8. Board Placeholder (used with Front Plane 3-Wide to take the place of a missing board (e.g., when you have a video out board, but no texture mapping board))
9. Spacer and Screw Assembly (2-Wide (not shown) and 3-Wide)

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Upgrade Instructions

1. Remove the A4244A Graphics Option board set from the workstation's card cage.
2. Flip the board set over so it is laying on the Front Plane (2) and the Spacer Assembly (9) is on top.
3. Loosen the screw in the Spacer Assembly and lift the Spacer Assembly off of the board set.
4. Flip the board set over again so the Front Plane (2) is on top (hang metal tongues of the board set over the edge of a table to get the board set to lay more horizontally).
5. Remove the Retaining Clip (1) by using your thumb to pry each side of the clip off of the Front Plane. Remove the End Retainers (not shown in Figure 1-1) from the Front Plane in the same manner, if applicable.
6. Carefully flip the board set over again so that the board set is resting on the Front Plane.
7. Pull the desired board(s) off the Front Plane by holding down the Front Plane while carefully working the board(s) out of the Front Plane connectors.

Note If you are upgrading from a two board set, you will need to remove both boards and switch to a 3-Wide Front Plane. The Front Plane can only be positioned one way. Improper positioning of the Front Plane can result in damage to connector pins. Ensure that the Front Plane is in the correct position by aligning the locators on the Front Plane and the boards (ensure that the Xs on the Front Plane match the Xs on the graphics boards, likewise with the Os).

---

8. If you are installing a Video Out Board (4), mount the Video Out Board onto the Frame Buffer Board (7) using the Standoffs (5). Then place the combined boards into the Front Plane, using Figure 1-1 as a reference. If you are not installing a Texture Mapping Board at this time, you must insert the Board Placeholder (8) in the 3-Wide Spacer Assembly (9) as shown in Figure 1-1 to take the place of the Texture Mapping Board.
9. If you are installing a Texture Mapping Board, install the board into the Front Plane by sliding the Texture Mapping Board (6) down in between the Geometry Accelerator and Frame Buffer Boards until the board's connectors are firmly seated in the Front Plane connectors.
10. After upgrade boards are installed into the Front Plane connectors, carefully flip the board set over so that the Front Plane is on top and replace the Retaining Clip.
11. Flip the board set over again so that it is resting on the Front Plane and replace the Spacer Assembly. After replacing the Spacer Assembly, ensure that you tighten the Spacer Assembly screw.
12. Flip the board set over once again and install the set into the workstation (see the workstation *Owner's Guide* for supported slots).

Note If a customer has purchased the A4248A video out product or A4245A texture mapping product for the A4244A frame buffer set, a designated HP representative *must* install this upgrade.

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grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`*⟨new_device_name⟩*
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
   ```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   `/dev/`*⟨new_device_name⟩*
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

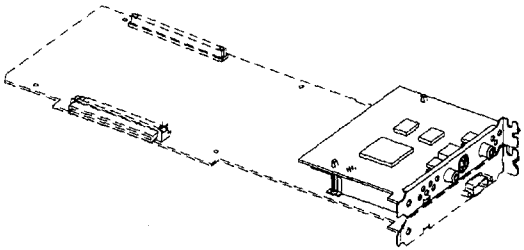
   ```
   mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
   ```


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Video Out Board (A4248A)

Upgrade Product—A4248A

For HP 9000 Model J Series



Video Out Board

New P/N	A4248-66001
Exchange P/N	A4248-69001
Standoffs P/N	0380-4378
Video Connectors & Cables	Video connectors & cables are not provided.

This board provides video out capability for workstations using the 8-Plane Frame Buffer Board (A4070B) and 24-Plane Frame Buffer Board (A4071B) and the A4244A. The A4248A video out board is user-installable for the A4070B and A4071B. If the A4248A is to be installed into an A4244A, refer to the A4244A CE documentation for details.

The user can select an area of a high resolution display for output to one of several analog video formats. The Video Out Board option receives this information in digital form and encodes it to standard international video formats for recording, display, and other use.

Note Additional software is required for the A4248A video out product.

Caution Ensure that connectors are properly aligned between frame buffer board and daughter board, and that pressure is applied evenly during installation; otherwise, you may damage connector pins and/or surrounding board components.

Refer to the appropriate software documentation (e.g., *Using the X Window System*, *Using HP-UX*, *HP Visual User Environment User's Guide*, and *Graphics Administration Guide*) and the workstation *Owner's Guide* for important information on system configuration.

Self-test in STI ROM reports to the screen and system unit front panel LEDs.

Software release 9.05 and later: Diagnostics are on the SupportWave product. SupportWave is documented in the *Precision Architecture RISC: Support Tools Manual* (9 vols.).

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grtest for HP-UX 9.05 and 9.X

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   ```
   /dev/(new_device_name)
   /dev/crt
   ```

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
   ```

grtest for HP-UX 10.X

1. The `grtest` routine is located in `/usr/sbin/diag`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly (see *Graphics Administration Guide*).
2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/X0screens /usr/lib/X11/X0screens.old
   ```

3. Edit `/usr/lib/X11/X0screens` to include:

   ```
   /dev/(new_device_name)
   /dev/crt
   ```

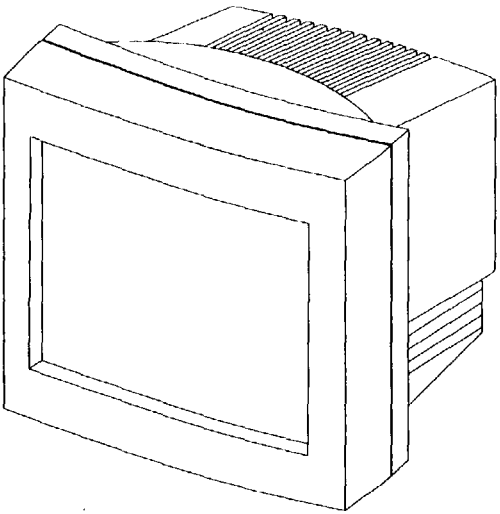
   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/X0screens.old  /usr/lib/X11/X0screens
   ```


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HP A4251 Multisync Color Monitors



HP A4251 Monitors

Replacements

Product Number	Part Number	Hemisphere	Size	Refresh Rate
HP A4251A	2090-0337	Northern	17 inch (1280x1024 pixels)	60 Hz
HP A4251B	2090-0334	Southern	17 inch (1280x1024 pixels)	60 Hz

Cable

A4251-62001 9-Pin D-Sub to 15-Pin D-Sub Signal Cable

Physical Dimensions

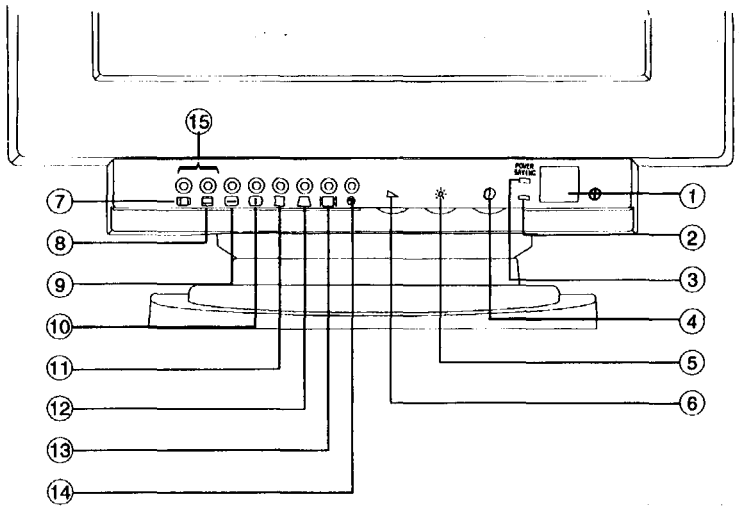
Height	435 mm (17.12 inches)
Width	421 mm (16.57 inches)
Depth	431 mm (16.96 inches)
Weight	21 kg (46.3 lbs.)
Screen Height	240 mm (9.45 inches)
Screen Width	320 mm (12.6 inches)

Timing Synchronization

Horizontal	30 KHz to 64 KHz (automatic)
Vertical	50 Hz to 100 Hz (automatic)

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Controls and Locations



Front Control Panel

Basic Controls and LED Indicator Functions

1 **Power Switch**

2 **Power Indicator (Dual Color)**—No adjustments made: LED glows green. Adjustment function selected: LED glows orange.

3 **Power Saver Indicator (Single Color)**—Glows green in suspend or off modes.

4 **Contrast Control**

5 **Brightness Control**

6 **Variable Adjustment Control**—Use the Variable Adjustment Control to adjust the displayed image when a control function is implemented (indicator LED is orange). Turn the Variable Adjustment Control counterclockwise to decrease the value of the adjustment function. Turn the control clockwise to increase the value of the adjustment function.

Approximately 3 to 4 seconds after completing an adjustment, the indicator LED toggles between orange and green, then remains orange for 6 to 7 seconds, indicating that the adjustment is saved. The On-Screen Display (OSD) remains on for about 10 seconds. When it disappears, the indicator LED turns back to green.

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Multifunction Buttons

This monitor incorporates both single and multifunction buttons. The multifunction buttons can access a second function in addition to the first one. To access the second adjustment function, push the function button twice. The table below shows you a list of multifunction buttons.

Button Number	Push Once	Push Twice
7	H-Position	Help
8	V-Position	Help
9	H-Size	Help
10	V-Size	Help
11	Side Pincushion	Help
12	Trapezoid	Help

Note If you push a button three times, the selected function returns to normal condition.

7 **Horizontal Position/Help**—Push this button once to adjust the horizontal position (centering) of the display. Use the Variable Adjustment Control to adjust. Push this button twice for help.

8 **Vertical Position/Help**—Push this button once to adjust the vertical position (centering) of the display. Use the Variable Adjustment Control to adjust. Push this button twice for help.

9 **Horizontal Size/Help**—Push this button once to adjust the horizontal size (width) of the display. Use the Variable Adjustment Control to adjust. Push this button twice for help.

10 **Vertical Size/Help**—Push this button once to adjust the vertical size (height) of the display. Use the Variable Adjustment Control to adjust. Push this button twice for help.

Note Do not push this button longer than 7 seconds continuously. If you do, this operation resets all of the data in the user memory area.

11 **Side Pincushion/Help**—Push this button once to adjust the vertical sides of the display from bowing in (pincushion) or bowing out (barrel distortion). Turn the Variable Adjustment Control until the vertical sides are straight. Push this button twice for help.

12 **Trapezoid/Help**—Push this button once to access the Trapezoid adjustment control to correct any Trapezoid (keystone-like) distortion of the display. Push this button twice for help.

13 **Recall**—Use this button to recall factory preset settings. When the Recall button is pushed, the indicator LED will change color from green to orange and the OSD will appear. Keep pressing the recall button for 2 to 3 seconds until the indicator LED's color changes to green, which indicates that the factory settings for that timing have been recalled.

Note This operation resets all of the data in the user memory area for the current signal timing.

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14 **Degauss** -Magnetic fields can build up on the CRT and cause color impurity. Use the degauss switch to demagnetize the CRT. Push the switch once to activate the degaussing circuit. The degaussing circuit automatically turns itself off after a few seconds.

15 **Parallelogram**—Push the Horizontal Position button and the Vertical Position button simultaneously for 4 to 5 seconds to activate the parallelogram function. Use the Variable Adjustment Control to adjust.

On-Screen Display

This monitor features an On-Screen Display (OSD) that shows information about the display settings to the user. The OSD appears on the screen when a function button is selected. The OSD shows the name, range, and current setting of the control function.

In addition, the OSD shows the current input signal frequency and the list of factory and user preset timings. The OSD remains activated approximately 10 seconds after any adjustment is completed.

Help Function

When you activate the Help function, the OSD shows the contents of the factory preset timing modes and user modes. User modes are followed by horizontal and vertical sync polarity (P: Positive, N: Negative). Use the Variable Adjustment Control to "page" through the list.

Custom Display Settings

This monitor has factory-preset display settings for each of the timings listed in the "Timing Specifications" section of this handbook. As a result, the monitor automatically adjusts to an optimum size and position when it senses one of the standard signal timings.

In addition to preset timings, the monitor has memory for up to 11 user-defined timings/settings. The microprocessor automatically memorizes the display settings that the user prefers for a specific signal timing and automatically adjusts when the monitor senses that signal (this includes making adjustments to factory-preset timings). An example of a user-defined setting would be 720 X 400 70 Hz.

Note CRX and HCRX graphics run at a horizontal scan rate of 76.65 KHz, which is outside the range of this monitor. Therefore, CRX and HCRX graphics are not compatible with this monitor.

Power Management System

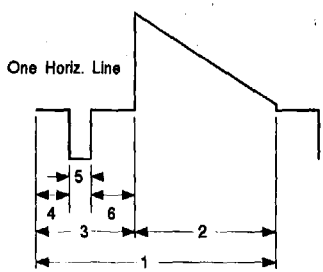
PowerSaver runs in four operational states:

On	Normal operation.
Stand-by	No video signal.
Suspend	Minimal power for quick recovery.
Off	Non-operation.

Note The Power Management System function may not be supported with the current operating system or X-Window system.

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Timing Specifications

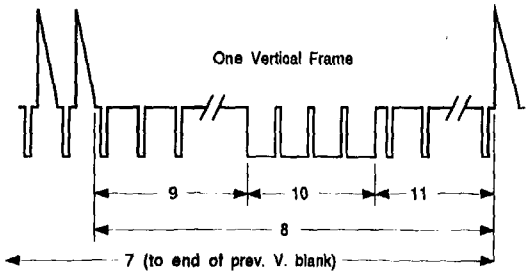


A4251 Horizontal Timing

Resolution	Refresh Rate (Hz)	Dot Clock Freq. (MHz)	Horiz. Sweep Rate (KHz)	(1) Horiz. Period (μs)	(2) Horiz. Active Time (μs)	(3) Horiz. Blank Time (μs)	(4) Horiz. Front Porch (μs)	(5) Horiz. Sync Width (μs)	(6) Horiz. Back Porch (μs)
640X400[1]	70	25.1750	31.4688	31.7776	25.4220	6.3555	0.6356	3.8133 (−)	1.9067
640X480[1]	60	25.1800	31.4750	31.7712	25.4170	6.3542	0.6354	3.8125 (−)	1.9063
640X480[2]	75	31.5000	37.5000	26.6667	20.3175	6.3492	0.5079	2.0317 (−)	3.8095
800X600[3]	60	40.0000	37.8788	26.4000	20.0000	6.4000	1.0000	3.2000 (+)	2.2000
800X600[2]	72	50.0000	48.0769	20.8000	16.0000	4.8000	1.1200	2.4000 (+)	1.2800
800X600[2]	75	49.5000	46.8750	21.3333	16.1616	5.1717	0.3232	1.6162 (+)	3.2323
1024X768[3]	60	65.0000	48.3631	20.6769	15.7538	4.9231	0.3692	2.0923 (−)	2.4615
1024X768[2]	70	75.0000	56.4759	17.7067	13.6533	4.0533	0.3200	1.8133 (−)	1.9200
1024X768[2]	75	78.7500	60.0229	16.6603	13.0032	3.6571	0.2032	1.2190 (+)	2.2349
1024X768[4]	75	84.5870	62.9368	15.8890	12.1059	3.7831	0.7566	1.5132 (−)	1.5132
1152X900	66	92.94	61.7952	16.1825	12.3951	3.7874	0.3013	1.3772 (−)	2.1089
1280X1024	60	108.1810	63.3378	15.7884	11.8320	3.9563	0.4067	1.7009 (−)	1.8488

1 PC mode
2 VESA standard
3 VESA guideline
4 HP mode

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A4251 Vertical Timing

Resolution	Refresh Rate (Hz)	(7) Vert. Period (ms)	(7–8) Vert. Active Time (ms)	(8) Vert. Blank Time (ms)	(9) Vert. Front Porch (ms)	(10) Vert. Sync Width (ms)	(11) Vert. Back Porch (ms)
640X400[1]	69.9306	14.2999	12.7110	1.5889	0.3813	0.0636 (+)	1.1440
640X480[1]	59.9524	16.6799	15.2502	1.4297	0.3177	0.0635 (−)	1.0485
640X480[2]	75.000	13.3333	12.8000	0.5333	0.0267	0.0800 (−)	0.4267
800X600[3]	60.3165	16.5792	15.8400	0.7392	0.0264	0.1056 (+)	0.6072
800X600[2]	72.1876	13.8528	12.4800	1.3728	0.7696	0.1248 (+)	0.4784
800X600[2]	75.0000	13.3333	12.8000	0.5333	0.0213	0.0640 (+)	0.4480
1024X768[3]	60.0038	16.6656	15.8799	0.7857	0.0620	0.1241 (−)	0.5996
1024X768[2]	70.0694	14.2716	13.5987	0.6729	0.0531	0.1062 (−)	0.5135
1024X768[2]	75.0286	13.3283	12.7951	0.5331	0.0167	0.0500 (+)	0.4665
1024X768[4]	74.9247	13.3467	12.2027	1.1440	0.06355	0.06355 (−)	1.0169
1152X900	65.9501	15.1630	14.5642	0.5988	0.0324	0.0647 (−)	0.5017
1280X1024	59.9790	16.6725	16.1673	0.5052	0.04736	0.04736 (−)	0.41049

1 PC mode
2 VESA standard
3 VESA guideline
4 HP mode

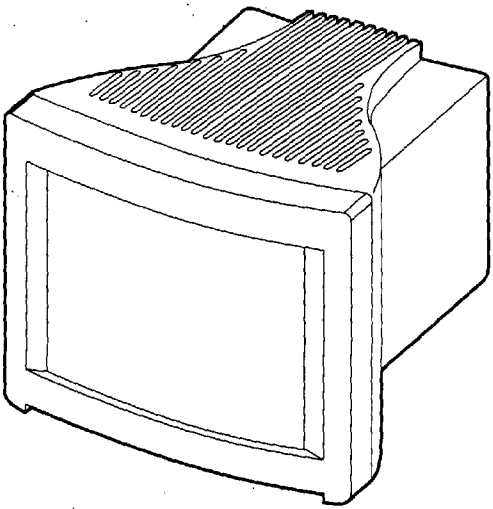
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Troubleshooting Chart

Problem	Item to Check	Location
There is no screen image.	Check power switch. LED should be on.	Front
	Check to see that power cord is plugged in.	Rear
	Ensure that signal cable is connected.	Rear
	Ensure that signal source is turned on.	Computer
	Ensure that signal cable pin assignment is correct.	Rear/Computer
Display rolls or tears.	Check to see that signal cable pin assignment is correct.	Rear
	Scan the frequency of video board.	Computer
Display is too dark or too bright.	Use the contrast and brightness controls to correct the problem.	Front panel
LED color is orange.	Check signal cables connection.	Rear/Computer
LED is blinking orange-green.	Check signal presence.	Computer
LED is blinking on-off orange.	Power Management System	Computer
Colors are not uniform (there are dark or shadow areas).	Push the degauss button once to activate the degaussing circuit.	Front panel
Display is too large or too small.	Push the horizontal size or vertical size button once to adjust the width or the height of the display. Use the Variable Adjustment Control to adjust.	Front

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HP A4330 Multimode Color Monitor



HP A4330 Monitor

Replacements

Product Number	Part Number	Hemisphere	Size	Refresh Rate
HP A4330A	2090-0525	Northern	17 inch (1280x1024 pixels)	Multimode
HP A4330B	2090-0526	Southern	17 inch (1280x1024 pixels)	Multimode

Cable

D2800-80006 or D2817-80006 — 15-Pin D-Sub to 15-Pin D-Sub Signal Cable

Physical Dimensions

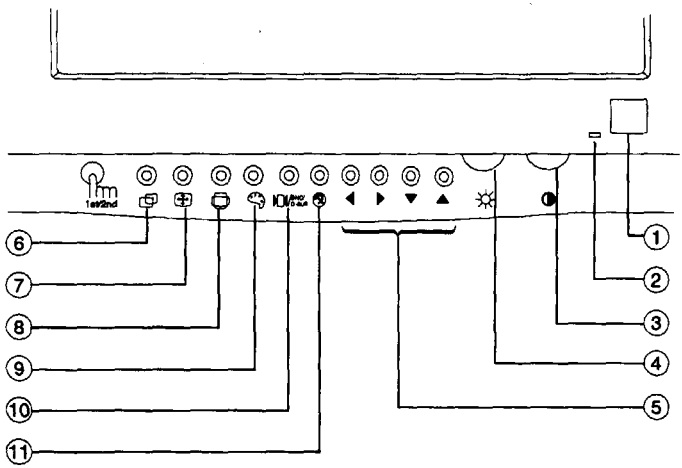
Height	426 mm (16.8 inches)
Width	434 mm (17.1 inches)
Depth	444 mm (17.5 inches)
Weight	19 kg (41.8 lbs.)
Screen Height	240 mm (9.45 inches)
Screen Width	320 mm (12.6 inches)

Timing Synchronization

Horizontal	30 KHz to 85 KHz (automatic)
Vertical	50 Hz to 150 Hz (automatic)

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Controls and Locations



Front Control Panel

Basic Controls and LED Indicator Functions

1 **Power Button**

2 **Power Indicator (Dual Color)**—No adjustments made: LED glows green. Adjustment function selected: LED glows orange.

3 **Contrast Control**

4 **Brightness Control**

5 **Adjustment Controls**—Use these buttons to adjust the displayed image when a control function is implemented (indicator LED is orange). Push the ▲ or ▶ button to increase the value of the adjustment function. Push the ▼ or ◀ button to decrease the value of the adjustment function.

After completing an adjustment, the indicator LED toggles between orange and green, then remains orange for about 10 seconds, indicating that the adjustment is saved. The On-Screen Display (OSD) remains on during this time. When it disappears, the indicator LED turns back to green.

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Multifunction Buttons

This monitor incorporates both single and multifunction buttons. The multifunction buttons can access a second function in addition to the first one. To access the second adjustment function, push the function button twice. The table below shows you a list of multifunction buttons.

Button Number	Push Once	Push Twice	Push Three Times
6	Position (H/V)	User, Preset Mode	
7	Size (H/V)	Information	
8	Pincushion/Trapezoid	Parallel/Tilt	
9	Color Temp.	Color Control	Sync Select
10	Recall	BNC/D-Sub	

6 **Position (H/V)/User or Preset Mode**—Push this button once to adjust the horizontal and vertical position (centering) of the display. Use the adjustment control buttons to adjust. Push this button twice to access the user and preset modes. The OSD shows the contents of the user modes and factory timing modes. Use the adjustment control buttons to "page" through the list.

7 **Size (H/V)/Information**—Push this button once to adjust the horizontal and vertical size of the display. Use the adjustment control buttons to adjust. Push this button twice to access the Information function. The OSD shows the contents of this monitor's specification. Use the adjustment control buttons to "page" through the list.

8 **G/D (Geometric Distortion)/Parallel & Tilt**—Push this button once to adjust the pincushion and trapezoid of the display. Use the adjustment control buttons to adjust. Push this button twice to adjust the parallel and tilt of the display. Use the adjustment control buttons to adjust.

9 **Color Temperature/Color Control/Sync Select**—Push this button once to choose the color temperature of the display. Use the ▲ and ▼ adjustment control buttons to select one of either 9300°K color, 6500°K color, or user color. 9300°K and 6500°K are the factory color modes. User color is adjustable. The initial value of channel 3 is equal to 9300°K. To change this color value, select user color, then select the color control button for hue and saturation. Adjust with the adjustment control buttons. The new color value automatically saves in 2 or 3 seconds.

Push this button twice to adjust the color hue and saturation. Use the ◀ and ▶ adjustment control buttons to access the color saturation and use the ▲ and ▼ adjustment buttons to access the hue function.

Push this button three times to select the video signal type. Use the ▲ and ▼ adjustment control buttons to select your choice. Always use the default setting (Separate) unless your entire screen appears too green. If this occurs, select Sync-on-Green.

10 **Recall**—Use this button to recall factory preset settings. When the Recall button is pushed, the indicator LED will change color from green to orange and the OSD will appear. Keep pressing the recall button for several seconds until the indicator LED's color changes to green, which indicates that the factory settings for that timing have been recalled.

Note This operation resets all of the data in the user memory area for the current signal timing.

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Push this button twice quickly to toggle between BNC and D-Sub connectors. This is available when both computers are connected and running. Otherwise, upon powering on, the monitor automatically uses the active input.

11 **Degauss**—Magnetic fields can build up on the CRT and cause color impurity. Use the degauss button to demagnetize the CRT. Push the switch once to activate the degaussing circuit. The degaussing circuit automatically turns itself off after a few seconds.

Note Do not push the degauss button longer than five seconds. If you do, this operation resets all of the data in the user memory area. If this occurs, you must reset your user adjustments.

On-Screen Display

This monitor features an On-Screen Display (OSD) that shows information about the display settings to the user. The OSD appears on the screen when a function button is selected. The OSD shows the name, range, and current setting of the control function.

In addition, the OSD shows the current input signal frequency and the list of factory and user preset timings. The OSD remains activated approximately 10 seconds after any adjustment is completed.

Information Function

When you activate the Information function, the OSD shows the contents of the factory preset timing modes and user modes. User modes are followed by horizontal and vertical sync polarity (P: Positive, N: Negative). Use the adjustment control buttons to "page" through the list.

Custom Display Settings

This monitor has factory-preset display settings for each of the timings listed in the "Timing Specifications" section of this handbook. As a result, the monitor automatically adjusts to an optimum size and position when it senses one of the standard signal timings.

In addition to preset timings, the monitor has memory for up to 11 user-defined timings/settings. The microprocessor automatically memorizes the display settings that the user prefers for a specific signal timing and automatically adjusts when the monitor senses that signal (this includes making adjustments to factory-preset timings). An example of a user-defined setting would be 720 X 400 70 Hz.

Power Management System

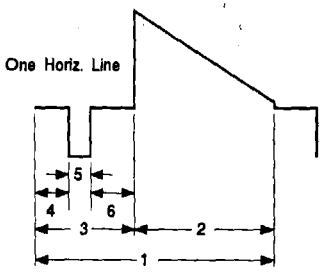
PowerSaver runs in four operational states:

On	Normal operation.
Stand-by	No video signal.
Suspend	Minimal power for quick recovery.
Off	Non-operation.

Note The Power Management System function may not be supported with the current operating system or X-Window system.

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Timing Specifications

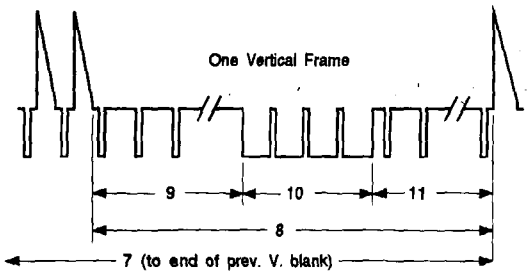


A4330 Horizontal Timing

Resolution	Refresh Rate (Hz)	Dot Clock Freq. (MHz)	Horiz. Sweep Rate (KHz)	(1) Horiz. Period (μs)	(2) Horiz. Active Time (μs)	(3) Horiz. Blank Time (μs)	(4) Horiz. Front Porch (μs)	(5) Horiz. Sync Width (μs)	(6) Horiz. Back Porch (μs)
640X480[1]	60	25.180	31.475	31.771	25.417	6.3542	0.635	3.813 (−)	1.906
640X480[2]	75	31.500	37.500	26.667	20.318	6.3492	0.508	2.032 (−)	3.810
800X600[3]	60	40.000	37.879	26.400	20.000	6.4000	1.000	3.200 (+)	2.200
800X600[4]	75	49.500	46.875	21.333	16.162	5.1717	0.323	1.616 (+)	3.232
1152X900[5]	76	105.561	71.713	13.945	10.913	3.0314	0.152	0.909	1.970
1280X1024	60	108.000	63.981	15.630	11.852	3.778	0.444	1.037 (+)	2.296
1280X1024	72	135.000	78.125	12.800	9.482	3.3185	0.474	1.422	1.422
1280X1024	75	135.000	79.976	12.504	9.482	3.0222	0.119	1.067 (+)	1.837
1024X768[6]	75	78.750	60.023	16.660	13.003	3.6571	0.203	1.219 (+)	2.235
1024X768[7]	75	84.587	62.937	15.889	12.106	3.7831	0.757	1.513	1.513
1280X1024[7]	75	135.000	79.976	12.504	9.482	3.0222	0.119	1.067 (+)	1.837

1 VGA
2 EVGA
3 SVGA
4 ESVGA
5 SUN
6 EUVGA
7 WKS

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A4330 Vertical Timing

Resolution	Refresh Rate (Hz)	(7) Vert. Period (ms)	(7–8) Vert. Active Time (ms)	(8) Vert. Blank Time (ms)	(9) Vert. Front Porch (ms)	(10) Vert. Sync Width (ms)	(11) Vert. Back Porch (ms)
640X480[1]	60	16.680	15.250	1.4297	0.318	0.064 (−)	1.049
640X480[2]	75	13.333	12.800	0.5333	0.027	0.080 (−)	0.427
800X600[3]	60	16.579	15.840	0.7392	0.026	0.106 (+)	0.607
800X600[4]	75	13.333	12.800	0.5333	0.021	0.064 (+)	0.448
1152X900[5]	76	13.150	12.550	0.5996	0.028	0.112	0.460
1280X1024	60	16.661	16.005	0.656	0.016	0.047 (+)	0.594
1280X1024	72	13.888	13.107	0.7808	0.038	0.038	0.704
1280X1024	75	13.329	12.804	0.5252	0.013	0.038 (+)	0.475
1024X768[6]	75	13.328	12.795	0.5331	0.017	0.050 (+)	0.467
1024X768[7]	75	13.347	12.203	1.1440	0.064	0.064	1.017
1280X1024[7]	75	6.927	6.402	0.5252	0.013	0.038 (+)	0.475

1 VGA
2 EVGA
3 SVGA
4 ESVGA
5 SUN
6 EUVGA
7 WKS

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Troubleshooting Chart

Problem	Item to Check	Location
There is no screen image.	Check power button. LED should be on.	Front
	Check to see that power cord is plugged in.	Rear
	Ensure that signal cable is connected.	Rear
	Ensure that signal source is turned on.	Computer
	Ensure correct signal source (BNC/D-Sub).	Front panel
	Ensure that signal cable pin assignment is correct.	Rear/Computer
Display rolls or tears.	Check to see that signal cable pin assignment is correct.	Rear
	Scan the frequency of video board.	Computer
Display is too dark or too bright.	Use the contrast and brightness controls to correct the problem.	Front panel
LED color is orange.	Check signal cables connection.	Rear/Computer
LED is blinking orange-green.	Check signal presence.	Computer
LED is blinking on-off orange.	Power Management System	Computer
Colors are not uniform (there are dark or shadow areas).	Push the degauss button once to activate the degaussing circuit.	Front panel
	Change the Sync Select option to Separate.	Front panel
Display is too large or too small.	Push the Size (H/V) button once to adjust the width or the height of the display. Use the adjustment control buttons to adjust.	Front
Display appears greenish.	Change the Sync Select option to Sync-on-Green.	Front panel
"Check signal cable" message.	Check the signal cable connection.	Rear/Computer

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3. Include Color Graphics Card in the screenfile—edit `/usr/lib/X11/XOscreens` to include *one* of the following:

   a. Color Graphics Card only: `/dev/`⟨*new_device_name*⟩ (instead of `/dev/crt`).
   b. Both outputs: Include both `/dev` statements in the following order:

      `/dev/`⟨*new_device_name*⟩
      `/dev/crt`

   The device file listed first becomes the default display device (it also becomes the device that has the HP VUE front panel), and the device file listed second becomes the secondary display device.

   Also, edit `/usr/vue/app-defaults/Vuewm` to include:

   ```
   Vuewm*multiScreen:  True
   Vuewm*screenList:   One  Two
   ```

   This gives HP VUE access to both screens.

   After your installation is complete, you can open a window on the second display by entering:

   `/usr/bin/X11/hpterm -display` ⟨*system_name*⟩`:0.1 &`

Boot Software Modification

1. After installation, if you want to have the boot software point to the Color Graphics Card as the preferred boot console, in `BOOT_ADMIN`, type:

   ```
   path console graphics_4
   ```

2. As `root`, reboot system using `/etc/reboot -h` (do not use VUE logout procedure).

grtest

1. The `grtest` routine is located in `/usr/diag/bin`. For `grtest` to execute properly, you must be logged in as `root` and set-up files must be configured properly. Device files for `grtest` should be set up as follows:

   ```
   crw-rw-rw-   1 root      root       12 0x000000 Sep 30 09:36 ⟨new_device_name⟩
   crw-rw-rw-   2 root      other      12 0x100000 Sep 30 09:37 crt
   ```

2. Preserve customer configuration file:

   ```
   cp /usr/lib/X11/XOscreens /usr/lib/X11/XOscreens.old
   ```

3. Edit `/usr/lib/X11/XOscreens` to include:

   `/dev/`⟨*new_device_name*⟩
   `/dev/crt`

   Define the screens in this order. This allows `grtest` routines to test the graphics devices properly. This also forces a single X server for both of the graphics devices.

4. Restore customer's configuration file—execute:

   ```
   mv /usr/lib/X11/XOscreens.old  /usr/lib/X11/XOscreens
   ```


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