Input jack specifications:

There are several types of input, selectable either from the Audio Devices menu (User Preference manu of Setup Mode) or directly from the HDS audio client.

These settings select the correct input levels for the audio signal. If you are using your own devices, choose the setting that gives the best audio response.

- HDS ViewCam - this is a video camera sold by HDS
- HDS Headset - this is a headset/microphone sold by HDS
- CallPort Speaker/Microphone - this is a integrated microphone and speaker that uses echo suppression for optimum response in noisy environments
- HDS Microphone - this is a microphone sold by HDS
- HDS Tuner - this is the TV/cable receiving device sold by HDS
- VCR - this sets an input level appropriate to most video cassette recorders
- Line Level Audio - this is a normal line level input setting
- Unspecified - this is for other input levels

Output jack specifications:

- HDS Internal Speaker - this sets the level for the ViewStation's internal speaker (2 W output at 8 Ohms. Harmonic distortion is 0.055% with power at 1 W)
- External speakers - this sets the level for self-powered external speakers
- HDS Headset - this sets the level for the HDS Headset (0.75 W at 1 V (peak-to-peak) when driving loads of 25-32 Ohms. Harmonic distortion is approx. 0.005% with 32 Ohm load)
- CallPort Speaker/Microphone - this sets the level for the CallPort integrated speaker/microphone with echo suppression

These signals can be either stereo or mono and have 8 or 16-bit audio sampling rates from 5 to 48 KHz. These settings, as well as signal inputs, are selected from the Setup Mode or from the options in the **HDS audio** client menu. This client is available from the HDSperx menu.

1.10.6.3 ViewStation Multimedia Audio Capabilities

The ViewStation Multimedia implementation gives you easy control by means of an audio manager client, **hdsaudio**, running locally on the ViewStation, with a Motif interface for user selections. Other local clients, such as **hdsplay**, permit use of sound files from the network. The ViewStation can mix its input with these network audio sources. **NetAudio** is also supported. The ViewStation's Audio clients are described in Section 2.7.

1.10.7 Other PC Card Devices

New items are being added to the ViewStation's PC Card support all the time.

```
srt -d      delete a source route entry
```

If the Token Ring adapter becomes unplugged from the Token Ring network, the user can issue a command to re-insert the adapter onto the network:

```
ifconfig trX up
```

(where trX = tr1 for the internal slot and tr2 for the external slot)

This reconnects the token ring adapter.

The "token" shell command displays token ring interface statistics.

1.10.6 Multimedia Devices

The HDS ViewStation has a PC Card card that supplies audio capability. This card inserts into the PC Card adapter card. Note that connectors for Audio In and Audio Out have to be fit into the back panel.

A complete discussion of ViewStation Multimedia operation is in Section 2.7.

1.10.6.1 Configuring the ViewStation for Multimedia

Verify that the ViewStation has an audio card on the PC Card adapter and that the audio card is functioning normally. ViewStations which have the audio card installed have two stereo audio connectors on the back panel labeled input and output. The Multimedia ViewStation also has an internal speaker installed. Selection of the correct audio input and output devices is available in Setup Mode (User Preferences menu).

Multimedia support requires software version V3.0 or higher. You must run this code to access the Multimedia card. You must also use the new entries showing the Multimedia Audio clients in the ViewStation Client Configuration File, */hds-fx/config/clients.config*, in the HDSware 3.0 distribution.

Locally, the ViewStation supports a */dev/audio* device which is compatible with the Sun audio device interface. To determine if a particular ViewStation supports audio, execute the command

ls /dev/audio

in a ViewStation Console window. If the result is '/dev/audio not found', then the ViewStation either does not have an audio card, the audio card may be improperly installed, or an older software version may be running which does not support the audio card.

Attach speakers or headphones to the stereo jack labeled 'output' on the back panel of the ViewStation. This is all the hardware configuration required for HDSperx Multimedia support.

1.10.6.2 ViewStation Multimedia Audio Specifications

The HDS ViewStation Multimedia unit has both input and output jacks on the back panel, using stereo 3.5mm connectors.

Token Ring communications can use either shielded twisted pair connectors (called Type 1 cabling) or unshielded twisted pair connectors (called Type 3 cabling). Cable adapters (DB9 or RJ45) are supplied with the Adapter card.

Network cable quality often determines whether 4 or 16 Mb ring speed is appropriate. Token Ring speed is jumper selectable for either 4 Mbps or 16 Mbps. This is controlled by jumpers on the JP9 block for the ViewStation FX and on the JP11 block on the ViewStation Ultra. Jumper pins 5-6 select the ring speed for the internal PC Card slot and jumper pins 7-8 select the ring speed for the external PC Card slot. Ring speed 4 Mbps is selected when the jumper is in place, and ring speed 16 Mbps is selected when the jumper is off. This configuration should be selected with the initial order so the correct configuration is installed, tested, and shipped.

ViewStation Software Interface

The hardware interface is used in the boot monitor to set the Token Ring IP address and netmask as follows (tr1 designates the internal PC Card slot and tr2 designates the external slot):

```
ip trx nnn.nnn.nnn.nnn

nm trx nnn.nnn.nnn.nnn
```

In the configuration file, the resources for configuring the Token Ring IP address, netmask, and MTU (Maximum Transmission Unit, default is 2052) are these:

```
HDSsetup.pcmcia.internal.tr.ipaddress: nnn.nnn.nnn.nnn

HDSsetup.pcmcia.internal.tr.netmask: nnn.nnn.nnn.nnn

HDSsetup.pcmcia.internal.tr.mtu: [ 516 | 1500 | 2052 | 4472
| 8144 | 11407 | 17800 ]

HDSsetup.pcmcia.external.tr.ipaddress: nnn.nnn.nnn.nnn

HDSsetup.pcmcia.external.tr.netmask: nnn.nnn.nnn.nnn

HDSsetup.pcmcia.external.tr.mtu: [ 516 | 1500 | 2052 | 4472
| 8144 | 11407 | 17800 ]
```

These settings are also available in the ViewStation's Setup Mode client.

ViewStation Token Ring communications supports source routing, so it will work on bridged networks. XDMCP and BOOTP are supported on the Token Ring network for both direct and broadcast access.

1.10.5.2 ViewStation Token Ring Controls

From the ViewStation's Console window, the "srt" shell command displays, adds, and deletes source route entries for token ring communications.

```
srt         displays all source route entries

srt –s      add/modify a source route entry
```

```
flashfilesys <inputfile.txt> <outputfile> or

flashfilesys <FX_disk.file> <V30.ffs>
```

This .ffs output file is the file actually loaded into the flash file system.

- Load the file into the Flash File System

  Store the output file in the Flash File system with the "flash files" command in the Console shell window. All of the flash file commands are protected by the Setup Mode password. This command is:

  flash files <outputfile> or

  flash files </128.91.3.1/HDSware/hds-fx/utils/src/flashfilesys/V30.ffs>

Note that this is a large file (approx. 60 MB for the HDSware distribution, less if you don’t load the documentation, special fonts, etc.) and that TFTP file transfer protocol has a 16 MB limitation. You must use FTP or NFS to transfer this file to the ViewStation’s hard disk.

1.10.5 Token Ring Interface Card

The HDS ViewStation supports Token Ring communications with its PC Card adapter card and a Token Ring “HDS PC Card Token-Ring 16/4 Adapter” card. This is an available option for all ViewStation models.

The ViewStation’s Token Ring communication complies with IEEE 802.5 standard and uses IEEE 802.2 packet types. The Token Ring communications option requires HDSware version 3.2 or higher. [Token Ring communications was also implemented with HDSware v3.0.2, but required a special bootprom. Note that if you are using the v3.0.2-E bootprom with 4Mb capacity, you must have a jumper set (position JP7 on the ViewStation FX; position JP6 on ViewStation Ultra) to indicate the higher bootprom capacity.]

The ViewStation can connect to Token Ring, Ethernet, and PPP networks simultaneously. It can have up to four IP addresses (one for each network) and can act as a network router, including passing information from one network to another. Refer to Section 1.4 formore complete discussion.

ViewStation local clients, such as the IBM 3270 terminal emulator, add powerful capabilities to the Token Ring communications feature. This terminal emulation permits direct connection to IBM mainframe systems on Token Ring networks (at the same time keeping other ViewStation connections and emulations open).

An additional ViewStation feature, the HDS Developer’s Kit, allows ViewStation customers to write and compile their own application programs to run on the ViewStation. This includes OSF/Motif applications which could be used on IBM mainframe computers without having either X or Motif running on the mainframe.

1.10.5.1 Token Ring Specifications

ViewStation Hardware Interface

The HDS ViewStation uses “tr1” to designate the token ring interface to the PC Card internal slot and “tr2” to designate the PC Card external slot.

If you want to load the HDSware software, there is an input file already made for you. This file is *./hds-fx/utils/src/flashfilesys/disk.files*. Check it to see that the files included there are the ones you want.

The HDSware distribution on CD-ROM includes a .ffs file constructed from standard HDS files.

If you want to use your own files, create a text file listing the files you want to load. Make sure the disk has sufficient space for the files you choose. The file should look like this:

```
#/home/hdssun1/mikeh/config/config.test    config.fx
/home/hdssun1/mikeh/bin/hdsxclock.Z        /bin/hdsxclock.Z
#/home/hdssun1/mikeh/clients/xfed.Z        /bin/xfed.Z
#/home/hdssun1/mikeh/lib/app-defaults/Xfed /lib/app-defaults/Xfed
/usr/lib/X11/i960/fonts/misc               /fonts/misc
/usr/lib/X11/i960/fonts/lotus              /fonts/lotus
                                           .     .
```

Each line of the file specifies the real file name and its corresponding flash file system file name. When a directory is specified, all files within a directory are included. Subdirectories are not included. Entries that begin with a ‘#’ character are ignored. Blank lines are allowed. In this example, a configuration file is stored as "config.fx" and two font directories are stored as "/fonts/misc" and "/fonts/lotus". The ViewStation checks for (and decompresses) compressed files with the extension .Z, so you can use compressed files in your flash file system.

Note also that this sample file contains a client that is part of HDSperx on the ViewStation (hdsxclock) which has its resources set in the local configuration files, *clients.config*. There is also another executable file (xfed - X font editor) that has its resources included in */dev/flash* as a separate file. You would have to modify the xfed resources to specify this new resource file location as the ViewStation Flash File system.

If you want to add or change files to your Flash File system, you must change the list and go through the procedure again.

- Create the output file with flashfilesys.

  There is a shell script called "flashfilesys" in the HDSware directory under *./hds-fx/utils/src*. The flashfilesys script organizes the files you’ve selected and creates a header for the files that includes the file names and their total length. This information is used to test whether there is sufficient space for storing it in the flash file system and that the files are readable, etc.

  The flashfilesys script is an executable file that runs on your host computer.

  This shell script takes two arguments, the name of the input file you generated in the previous step, and the name of the output file for the flash file system file.

1.10.4.4 Using the flash Command

The flash command is a Console window command. It is password protected. You can use it to program ViewStation FlashPROM and PC Card devices. It is available from any Console window, either local on the ViewStation, or from a remote Console window from another device.

There are three parts of the flash command:

flash boot <*filename*>

flash server <*filename*>

flash files <*filename*>

1.10.4.5 The flash boot Command

The flash boot command programs the bootprom on the FlashPROM card.

1.10.4.6 The flash server Command

The flash server command programs the server code on the FlashPROM card. It can also be used to program a ROM card (though probably not a hard disk).

The flash server command should be used first because it allocates a reserved block at the top of the available memory. Subsequent loading of the ROM card by using the flash files command will not overwrite the reserved server block but use only the available memory remaining. The reverse procedure will not work, since the flash server command will overwrite any flash file load.

Note that all the files in your flash file system are erased when you load a new version of server code using the "flash server" command. This means that you must reprogram the flash file system using "flash files" each time you use the "flash server" command.

1.10.4.7 The flash files Command

The flash files command loads a special file into the available flash or disk memory. This special file must be prepared with the “flashfilesys” script. The procedure is outlined below.

There are several arguments for the flash files command:

flash files [-rs] [-n] [filename]

-rs Remove Flash server code image

-n Display number of bytes available for Flash filesystem

To load files onto your hard disk, follow this procedure:

- Check the available memory with the -n command argument:
  flash files -n
- Remove the server code file (if you've loaded it in a reserved section) with the -rs command argument:
  flash files -rs
- Select the files to load.

with this installation. The pins are small and tightly spaced so be sure to insert the device carefully.

- Boot the ViewStation from the network, using Monitor Mode. You should load HDSware version 2.2 or higher.
- Use the *config.fx.dsk* and *clients.config.dsk* files or make the appropriate changes to your own *config.fx* and *clients.config* entries for the files you are putting on the device. These modified files should be part of your new flash file system.
- Use the fdisk command to format the hard disk.
- Use the flash files command to load your files onto the disk.

At this point, your files are loaded and your configuration files specify the correct paths so your own ViewStation (or other ViewStations) can find them. All you have to do is turn on the ViewStation.

1.10.4.2 Using the Hard Disk Drive

The HDS ViewStation's hard disk drive is especially convenient in some system environments, such as remote locations on a PPP link, or isolated environments. The hard disk can be used for booting the individual ViewStation where it is installed and also any other ViewStations. It can serve as the HDSware file server for fonts, local clients, etc.

For Internal Booting and File Service

With the internal hard disk drive, the ViewStation boots and loads its files from the disk. It accesses the disk as if it were a network device, but uses the IP loopback address (127.0.0.1) and the directory path of */dev/flash* as its HDSware location. Local clients, fonts, etc. are read directly from the disk.

These settings are made at the factory, so all the user has to do is turn on the ViewStation and all the software is immediately available. ViewStations with a hard disk installed should use the special configuration file *./hds-fx/config/config.fx.dsk*.

For External Booting and File Service

Other ViewStations can use this HDSware location by specifying the HDSware location as the disk-equipped ViewStation's IP address as the HDSware host and */dev/flash* as the HDSware directory.

This permits booting, client loading, font loading, etc. to run from a ViewStation instead of a host computer.

1.10.4.3 Using the fdisk Command

The fdisk command is a Console window command. It is password protected. You can use it to format or erase ViewStation FlashPROM and PC Card devices. It is available from any Console window, either local on the ViewStation, or from a remote Console window from another device.

The fdisk command must be used for disks being programmed for the first time. ViewStations equipped with ROM or hard disks from the factory do not need to use the fdisk command.

server code as an HDSware file (*./hds-fx/image/Vnn-D.hds*) on the PC Card device generates a “Network” boot, even though the network in this case is entirely internal to the ViewStation.

The system administrator, using remote login to the Console session, can burn flashPROMs for all the ViewStations on the network. Note that these procedures are all password protected, so unauthorized users cannot use these commands.

1.10.3 ViewStation ROM cards

The ViewStation can use a number of PC Card ROM cards. Two sizes are supported, 2.5 MB and 5.0 MB.

These devices can be used for storing the ViewStation’s server code and any additional files you might need, such as the window manager, other local clients, selected fonts, etc. In the factory configuration, the ROM cards come with only the ViewStation’s server code loaded.

You can program the ROM cards (and the hard disks) with the Flash command, described below.

1.10.4 Hard Disk Drive Storage Devices

The HDS ViewStation supports PC Card hard disk drives. Two sizes are supported, 20 MB and 40 MB.

These hard disk drives can be used for storing the ViewStation’s server code and other ViewStation files, such as window managers, local clients, fonts, etc. In the factory configuration, the hard disk drives come with the HDSware software loaded. The entire HDSware distribution does not quite fit on the 20 MB disk. On the 20 MB disk, the */utils* and */contrib* directories are not loaded (since these contain utility programs that run on the host, this is a reasonable omission).

You can load your own files onto the hard disk drive with the Flash command, described below.

If you have a hard disk installed, you must use the hard disk for booting - you cannot use an HDS FlashPROM card. The PC Card hard disk (with a PLCC boot prom installed on the main board) replaces the FlashPROM card.

1.10.4.1 Adding a PC Card Hard Disk Drive

If you are adding a PC Card device (such as a disk drive) to an existing ViewStation, the procedure is simple. Follow these steps:

- Check the boot prom version, it must be version 2.4 or greater, to recognize the PC Card device.
- Install the PC Card adapter card. Open the ViewStation base and use the long connector on the right rear edge of the circuit board. Make sure it is correctly seated and that the pins are correctly aligned. Remove the coverings for the backpanel openings for the PC Card and/or Audio connectors.
- If you already have a PC Card adapter card, you may have to install the PC Card device itself. It simply plugs into a socket on the adapter card. Be careful

1.10.2 ViewStation FlashPROM

This is s special HDS FlashPROM memory card that uses a special connector on the PC Card adapter card. This permits both PC Card slots to be used for PC Card devices..

If you have a PC Card adapter card with the HDS FlashPROM memory card installed, you cannot use a hard disk drive in a PC Card slot without first removing the FlashPROM card and installling a PLCC boot prom.

1.10.2.1 Loading New Server Code into flashPROM

If you have a new version of the ViewStation server code and want to load it into the flashPROMs, follow this procedure:

- Load the server code file - Load the new server code from the HDSware tape into a directory on your boot host (it must be a .hds file). The server code is in a directory called *./hds-fx/image*, with several versions having names like this:

  /hds-fx/image/Vnn-D.hds

  /hds-fx/image/Vnn.hds   and so on.

  The file names indicate the version level of the code (Vnn) and whether this server code file includes the capability to download clients (-D), such as window managers and other HDSperx clients.
- Open a Console Window - Open a Console session (from Setup Mode or a remotely via rlogin). Note that flashPROM commands are password protected. If a password is set, you must enter it in the Console session before you can use the flashPROM commands. Entering the password changes the Console session prompt from hds> to HDS>.
- Enter this command from the HDS> prompt:

  flash server <*full path/filename*>   (this must be a .hds file)

  flash server /128.91.3.1/home/HDSware/hds-fx/image/V3.0-D.hds

  The Console window will report the progress of the load, including the erasing of the FlashPROMs and loading the new server code file.
- If you want to burn a new bootprom, you can use this command:

  flash boot <*path/filename***>**   (this must be a .bin file)

  Note that some ViewStations orignally ordered without FlashPROM have the bootprom in a PLCC ROM on the main circuit board rather than on the FlashPROM board. If you have the PLCC bootprom configuration, the bootprom cannot be reprogrammed.

The new server code you selected will be loaded into the flashPROM. Messages reporting the erase procedure and the load progress appear in the Console session.

You could separately flash the bootprom file and/or the server code file into the storage device, depending on your preference. The separate flash boot and flash server loading for the generates a “ROM” boot for the ViewStation. Loading the

HDS ViewStation: PC Card Devices

This chapter describes the ViewStation's PC Card device support and its operation.

Section 1.0 - HDS ViewStation

1.10 PC CardDevices

The PC Card, formerly PCMCIA (Personal Computer Memory Card Interface Association), interface is a hardware and software specification for add-on devices. This interface is supported on the HDS ViewStation for expansion devices.

The HDS ViewStation currently supports these PC Card devices:

Memory cards, 2.5 and 5.0 MB
Hard disk drives, 20 and 40 MB
Token Ring network card
HDS Audio card

New PC Card devices are being added to the ViewStation's capability.

1.10.1 ViewStation PC Card Adapter Card

The HDS ViewStation has an adapter card for PC Card devices. This is a daughter board which can be added to the main circuit board. It supports two PC Card devices, one internal and one external, as well as an internal FlashPROM card. Each device is independent and equivalent.

The PC Card Adapter card can be added to the ViewStation by plugging it into the main circuit board connector. The ViewStation's back panel has an opening for the PC Card connector but may have a temporary covering installed.