IECCBM	IEC monitor cable
Manual	
NOMNL	No manual
MNL	Manual

The monitor value is entered in field 15

15 Monitors

The ViewStation monitors are described in the video settings table above.

(no monitor)	0 = none

Examples:

For Model number = `G1F0081-111-28A`

Description: FX16 19M 8M 1B FL CM MON

Circuit Board

`G1` = FXA, 16 MHz circuit board

`F0` = video setting for FX19M, 76 KHz

`0` = no circuit board options

`8` = 8 MB of memory

`1` = 1 bitplane (monochrome)

Base

`1` = FlashPROM (both WM, 16 Mb)

`1` = Comm board

`1` = 120 VAC power

Options

`2`= 101+ style keyboard

`8` = Mouse, Mnl, ACCBL, 3MONCBL

Monitor

`A` = 19M 76 KHz - F7A240-Y5BF

1	Mouse, Mnl, ACCBL
2	Mouse, Mnl, ACCBL, RGBCBL
3	Mouse, Mnl, ACCBL, MONOCBL
4	Mouse, NoMnl, ACCBL
5	Mouse, NoMnl, ACCBL, RGBCBL
6	Mouse, NoMnl, ACCBL, MONOCBL
7	Mouse, NoMnl, ACCBL, 3MONCBL
8	Mouse, Mnl, ACCBL, 3MONCBL
9	Mouse, Mnl, NoACCBL
A	TKBL, Mnl, ACCBL
B	TKBL, Mnl, ACCBL, RGBCBL
C	TKBL, Mnl, ACCBL, MONOCBL
D	TKBL, Mnl, ACCBL, 3MONCBL
E	Mouse, Mnl, UKCBL
F	Mouse, Mnl, UKCBL, RGBCBL
G	Mouse, Mnl, UKCBL, MONOCBL
H	Mouse, Mnl, UKCBL, 3MONCBL
M	No Mouse, ACCBL, MNL
R	Mouse, Mnl, ACCBL, 17HMONCBL

Note that the following mnemonics designate the corresponding parts:

Mouse	
(none)	No mouse
MOUS	Standard mouse
TKBL	Trackball
Video Cable	
(none)	No video cable
MONOCBL	Mono video cable
RGBCBL	RGB video cable
3MONCBL	Mono 3-connector cable - GHV
17HMONCBL	Mono 3-connector cable - GHV
Power Cable	
NOACCBL	No power cable
ACCBL	US AC cable
UKCBL	UK AC cable
HSPCBL	Hospital cable

8B	2 = 8 bitplanes - 1 bank VR (1024 only)
8B2	3 = 8 bitplanes - 2 banks VR (>1024)

8 Used as a separator hyphen only “-”

This field specifies the flashPROM board type

9 ROM

(none)	0 = Boot Prom only
FL	1 = Flash (16 Mb)

This field specifies the communications options

10 Ethernet Com

(none)	0 = No comm. board
CM	1 = Comm board

This field specifies the AC power setting

11 Power

120	1 = 120 VAC, std. monitor outlet
220	2 = 220 VAC, IEC outlet
HSP	3 or 5 = Hospital UL544, IEC outlet

12 Used as a separator hyphen only “-”

ViewStation Option Package Model Numbers

These are entered as a 2 digit value in fields 13 and 14, according to the following table (field 13 specifies the keyboard style, and field 14 is a sequential number for other option groups):

Keyboard values are specifically defined and used as the first digit in the Options table entry:

13 Keyboard

NKB	0 = No keyboard
KB	2 = 101+ style
DKB	4 = LK-401 style
SKB4	5 = Sun Type 4 keyboard
USDKKB	6 = US Datakey
SKB5	7 = Sun Type 5 keyboard
USCRKB	8 = US Cardreader
SKB5U	9 = Sun Type 5 UNIX keyboard
LXKB	L = Lexmark keyboard

The option packages are defined as follows:

14 Option Package

0	ACCBL only

This field sets circuit board options

5	**Option**	
	(none)	0 = No options
	SKB	1 = Sun Type 4 or Type 5 keyboard
	DUAL	2 = Dual Video Display (1024 wide x 2)
	TR16	4 = Token Ring (16Mb ring speed)
	TR4	5 = Token Ring (4 Mb ring speed)
	SDK	8 = Serial Datakey port
	PKB	P = PS/2 keyboard interface

This field sets the memory configuration. These values are permitted:

6	**Memory**	**Setting**	**FX, LX series**	**Ultra**	**FXVideo**
	0M	0 = 0 MB	No	Yes	Yes
	4M	4 = 4 MB	Std config	No	No
	6M	6 = 6 MB	Yes	No	No
	8M	8 = 8 MB	Yes	Std.config	Std.config
	10M	9 = 10 MB	Yes	No	Yes
	12M	A = 12 MB	Yes	No	Yes
	16M	B = 16 MB	Yes	Yes	Yes
	20M	C = 20 MB	Yes	No	Yes
	24M	D = 24 MB	Yes	No	Yes
	28M	E = 28 MB	Yes	No	No
	32M	F = 32 MB	No	Yes	Yes
	36M	G = 36 MB	Yes	No	No
	40M	H = 40 MB	Yes	No	Yes
	48M	I = 48 MB	No	No	Yes
	52M	J = 52 MB	Yes	No	No
	64M	K = 64 MB	No	Yes	Yes
	68M	L = 68 MB	Yes	No	No
	128M	M = 128 MB	No	Yes	Yes
	132 M	N = 132 MB	Yes	No	No

Note: for ViewStation Ultra, the memory must use identical SIMM pairs, so available memory is 8, 16, 32, 64, or 128 MB only.

This field sets the number of video bitplanes

7	**Bitplanes**	
	1B	1 = 1 bitplane - 256K VR (monochrome)

Video (3,4)	Mon. (15)	Name	HDS P/N	Vendor P/N	Cable
00	obs.	19C	MO-V19C-S	C/T-20	3
			MO-V19CN-S	CN-20	3
10	obs.	19MM	MO-V19-S	VCX 68KHz	2
20	7	17M	MO-17-S	DS1792	1
31	L	17CS	MO-V17CS	KDM1767E	A
	M	17CH	MO-V17CC-HR	1760LR (1280)	A
	8	17CT	MO-V17CT-S	TFS6706ETK	A
40	obs	15M	MO-V15-S	BDC1502	1
50	3	14CM	MO-V14C-S	FW6405ATK	A
	3 obs.	14CC	MO-V14CC-S	CDS4313	5
	3	14CS	MO-V14CS	KDM1466	A
	F	14CS2	MO-V14CS-2	KDM1466 (220V)	A
	S	14CSHSP	MO-V14Cs-HSP	KDM1466 (UL544)	A
	K obs.	15C	MO-SD5500	SD5500	A
	K	15CS	MO-V15CS	KDM1566	A
	R	15CS2	MO-V15CS-2	KDM1566 (220V)	A
	L	17C	MO-V17CC	1760LR	A
	L	17CS	MO-V17CS	KDM1767E	A
	L	17CS2	MO-V17CS-2	KDM1767E (220V)	A
	G obs.	19CM	MO-V19CM	HL6955SETK	A
52	J obs.	14M	MO-V14R	X-1457-HDS	A
60	obs.	19MS	MO-V19M-1	BDC2003	1
70 (or 71)	C	19CT	MO-V19CT-S	C/T-20D, A or H	3
	D obs.	19CI	MO-V19CI	HM4020D, HM4419D	3
	P	19CS	MO-V17CTN	447E	A
72		SW72		No sync on green	
83		VGA		640x480 VGA	
93		VGA8		800x600 SVGA	
F0	A obs.	19M	MO-V19M	F7A240Y5BF	2
	N	19M1	MO-V19M-1	BDC2003	1
F1	H	17H	MO-V17H	MO-V17H (1024)	H
	I	17H1	MO-V17H-1	MO-V17H-1 (1152)	H
	J	17H2	MO-V17H-2	MO-V17H-2 (1280)	H

Cable Description (P/N and legend):

A = Cable is attached or supplied
1 = WI-Mono DB15HD to BNC
2 = WI-3Mon DB15HD to 3 BNC GHV
3 = WI-RGB3 DB15HD to 3 BNC RGB
5 = WI-RBG5 DB15HD to 5 BNC RGBHV
H = WI-3Mon-17H DB15HD to 3 BNC GHV

Base	“BA” specified by fields 1 through 11 (includes CB)
Options	“OPT” specified by fields 13 and 14
Monitor	“MON” specified by field 15

Model Number and Character position:

1 2 3 4 5 6 7 - 9 10 11 - 13 14 15

positions 1-9 are for the Circuit Board

1 2 3 4 5 6 7 - 9 10 11 - 13 14 15

positions 1-11 are for the Circuit Board +Base

1 2 3 4 5 6 7 - 9 10 11 - 13 14 15

positions 13-14 are for Options

1 2 3 4 5 6 7 - 9 10 11 - **13 14** 15

position 15 is for the Monitor

1 2 3 4 5 6 7 - 9 10 11 - 13 14 **15**

The model number consists of a series of fields with the field location containing values indicating the configuration for that unit. Hyphens are inserted to distinguish kit component groups. The model numbers use these selectors in their appropriate fields:

Field LocationMnemonic	Configuration Entry
1, 2 Product	
LX series	L1 = FXD, 16 MHz
FX16	G1 = FXA/B/D, 16 MHz
FX25	G2 = FXA/B/D, 25 MHz G series = 1024 wide/8 bit or 1280 wide/1bit
FX16	J1 = FXB/C/D, 16 MHz J series = 1152 or 1280/8 bit
FX25	J2 = FXB/C/D, 25 MHz
Ultra	I3 = FXI, 33 MHz
FXV	V2 = FXV, 25 MHz (Video)
	V4 = FXV, 33 MHz (Video)

The following table shows ViewStation monitors, with fields 3,4 for the video switch setting and field 15 for the monitor. It also lists monitor part numbers and the video cables needed or supplied.

The 3,4 field sets the circuit board video configuration (field 3 = Hex switch setting; field 4 = jumpers or other video options). Settings for monitors no longer shipped are included.

1.1.12 HDS ViewStation Number Encoding

The ViewStation uses its Serial Number and its Part Number to provide important information to you in a convenient way. The ViewStation has a label on the left rear corner of the base containing both a serial number and a model number.

1.1.12.1 HDS ViewStation Serial Number

The ViewStation's serial number is composed of the date of manufacture and the last six digits of the ViewStation's Ethernet address. The number is made up as follows:

A b cc dddddd

where

A = major revision level (circuit board or components)

b = one digit to give the year of manufacture

cc = two digits to give the month of manufacture

dddddd = the lowest six digits of the Ethernet (hardware) address

For example, a serial number of D305c8161b would show a D revision level, a manufacture year of 3 (for 1993), a manufacture month of 05 (May) and the lowest six digits of the hardware address as c8161b.

Note that the full Ethernet hardware address is 12 digits long. The highest 6 digits are the vendor code, which is 008096 for HDS. These two fields are combined to make the entire Ethernet address. In this case the full address would be:

008096c8161b

This Ethernet address is needed for starting the ViewStation with BOOTP (other starting methods don't use it). If you're using BOOTP, looking at the serial number is an easy way to get the Ethernet address.

1.1.12.2 HDS ViewStation Part Number

The ViewStation Part Numbers contain information that defines the ViewStation's configuration. You can also get this information from the "hwconfig" command from the Console Window, discussed in Section 1.2.1.

Standard configuration is base, 4 MB DRAM memory, no flashPROM, no communications board, 110 AC power, IBM kybd., mouse, manual; with video setting, bit planes, monitor, and monitor cable as appropriate.

Component level descriptions of these basic configurations are given below.

The ViewStation is composed of a KIT, which contains a Base (with Circuit Board options), an Options group, and a Monitor. There is a separate kit for the PCMCIA board and its options. All of these elements are described by values encoded in the model number. The base model number is found on the serial number label located on the back left side of the base.

The KIT consists of four parts:

Circuit Board	"CB" specified by fields 1 through 9

```
"9x15.snf.Z                                  -misc-fixed-medium-r-normal--15-140-75-75-c-
990
                                             -iso8859-1"
"10x20.snf.Z                                 -misc-fixed-medium-r-normal--20-200-75-75-c-
100
                                             -iso8859-1"
"helvB12.snf.Z                               -adobe-helvetica-bold-r-normal--12-120-75-75-p
                                             -70-iso8859-1"
"courR18.snf.Z                               -adobe-courier-medium-r-normal--18-180-75-75
                                             -m-110-iso8859-1"
"term14.snf.Z                                -dec-terminal-medium-r-normal--14-140-75-75-c
                                             -80-iso8859-1"
"timB12.snf.Z                                -adobe-times-bold-r-normal--12-120-75-75-p-67
                                             -iso8859-1"
"olcursor.snf.Z                              -sun-open look cursor-----12-120-75-75-p-160
                                             -sunolcursor-1"
"olgl12.snf.Z                                -sun-open look glyph-----12-120-75-75-p-113
                                             -sunolglyph-1"
"luBS12.snf.Z                                -b&h-lucida-bold-r-normal-sans--12-120-75-75-p
                                             -79-iso8859-1"
"luRS12.snf.Z                                -b&h-lucida-medium-r-normal-sans--12-120-75
                                             -75-p-71-iso8859-1"
"cursor.snf.Z                                cursor"
"deccurs.snf.Z                               decw$cursor"
"decsess.snf.Z                               decw$session"
```

Standard aliases are:

```
"FILE_NAMES_ALIASES"
"variable                                    -adobe-helvetica-bold-r-normal--12-120-75-75-p
                                             -160-iso8859-1"
"fixed                                       -misc-fixed-medium-r-semicondensed--13-120
                                             -75-75-c-60-iso8859-1"
"-DEC-MENU-MEDIUM-R-NORMAL--12-120-75-75-p-70-iso8859-1
                                             -adobe-times-bold-r-normal--12-120-75-75-p-67
                                             -iso8859-1"
"-DEC-TERMINAL-MEDIUM-R-NORMAL--18-180-75-75-m-70-iso8859-1
                                             -adobe-courier-medium-r-normal--18-180-75-75
                                             -m-110-iso8859-1"
"-DEC-TERMINAL-MEDIUM-R-NORMAL--14-140-75-75-m-70-iso8859-1
                                             -dec-terminal-medium-r-normal--14-140-75-75-c
                                             -80-iso8859-1"
```

These specifications are subject to change without notice.

- Internet Protocol (IP) RFC791 and MIL-STD-1777 as an end node only
- Transmission Control Protocol (TCP) RFC793 and MIL-STD-1778
- User Datagram Protocol (UDP) RFC768
- Internet Control Message Protocol (ICMP) based on RFC792
- Serial Line Internet Protocol (SLIP) based on RFC 1055
- Compressed SLIP protocol based on RFC 1144 (Van Jacobsen compression)
- Point to Point Protocol (PPP) based on RFC 1144, 1331
- SNMP protocol based on RFC 1065, 1066, 1067; 1156, 1157, 1158 (MIB II)
- XDMCP protocol based on MIT X11R5 X Window System

1.1.11.5 Terminal Emulator

The ViewStation provides two terminal emulations for Telnet remote terminal access protocol according to RFC854, RFC855, RFC857, RFC858, and MIL-STD-1782. HDSterm provides a VT320 emulation and the TTY terminal service provides an ANSI emulation.

HDSterm is a full-featured VT320 terminal emulator that is the user interface for Telnet connections. HDSterm is also used for the Serial and Console window interfaces. This is available with server code designations Vnn-D.hds.

A TTY terminal service is also available. It runs on top of the transport level services, including the user interface for Telnet . This is available with server code designations Vnn.hds.

1.1.11.6 Font Loading

Fonts are loaded from an X11R5 font server or dynamically loaded using FTP (RFC959) or TFTP (RFC783) from the font host specified in Setup Mode.

- File Transfer Protocol (FTP) based on RFC959
- Trivial File Transfer Protocol (TFTP) based on RFC783
- Network File Service (NFS)

1.1.11.7 Server-Resident Fonts

The ViewStation has 18 X11R5 fonts and 6 aliases built into the server. These are stored as compressed fonts and uncompressed internally on demand. The standard ViewStation fonts and aliases are:

"6x10.snf.Z	-misc-fixed-medium-r-normal--10-100-75-75-c-60-iso8859-1"
"6x12.snf.Z	-misc-fixed-medium-r-semicondensed--12-110-75-75-c-60-iso8859-1"
"6x13.snf.Z	-misc-fixed-medium-r-semicondensed--13-120-75-75-c-60-iso8859-1"
"8x13B.snf.Z	-misc-fixed-bold-r-normal--13-120-75-75-c-80-iso8859-1"
"8x13.snf.Z	-misc-fixed-medium-r-normal--13-120-75-75-c-80-iso8859-1"

Startup Options Menu

This menu controls the ViewStation operation with the RARP and BOOTP protocols. This menu sets paths for server code download, configuration file location, and startup file location.

Restart and Shutdown Menu

This menu restarts the ViewStation. This function operates to restart the ViewStation using the ROM server image, the current RAM server image, or reload the server image from the network, depending on the user’s selections.

Reset NVM to Factory Defaults

This menu lets you change all your Setup Mode selections (except the password, and screen resolution) back to their original factory settings.

Restore Settings from NVM

This menu lets you restore your settings to those from the most recently saved NVM configuration.

1.1.11.3 Setup Mode Command Buttons

The Main Menu also includes buttons for Setup Mode commands, including:

- **Apply** - for applying current settings
- **Save** - for saving current settings in NVM
- **Undo** - for removing current settings
- **Exit** - for exiting the Setup Mode client
- **Help** - for displaying Help messages about Setup Mode selections
- **Restart** - for restarting the FX server
- **Reboot** - for rebooting the ViewStation, from the network or from flashPROM

1.1.11.4 Network Services

These network services support many simultaneous sessions and clients, including:

- Ethernet Driver to receive and demultiplex multiple packet types
- Ethernet Driver for IEEE 802.3, with auto-sensing
- Token Ring Communications for IEEE 802.2 packets
- Address Resolution Protocol (ARP) based on RFC826
- Reverse Address Resolution Protocol (RARP) based on RFC903
- BOOTP protocol based on RFC 951, 1015, 1048, and 1084
- Remote Configuration based on the BOOTP protocols above
- File Transfer Protocol (FTP) RFC959 for file transfer
- Trivial File Transfer Protocol (TFTP) RFC783 for file transfer
- Network File System (NFS) for file transfer
- X11R5 Font Service
- Domain Name Service based on RFC883 and RFC1035

- Setup Options Menu
- OPEN LOOK Window Manager client (with Run at Restart option)

Setup Options Menu

The "Setup Options" button brings up the following menu:

- Return to Main Menu
- Communications Options
- XDMCP Options
- Remote Hosts
- Domain Name Servers
- User Preferences
- Startup Options
- Restart and Shutdown Menu
- Reset NVM to Factory Defaults
- Restore Settings from NVM

Some of the principal functions are listed below as they appear in these menus:

Communications Options Menu

This menu lets you set various network specifications, such as netmask and gateway information. This menu sets the Ethernet and Token Ring communications, and also SLIP, CSLIP, and Serial Terminal Emulation communications operations.

XDMCP Options Menu

This menu allows you to select the XDM Display Manager to manage your ViewStation display, along with the type of XDMCP message to send to initiate XDM and to set XDM timeout values. This menu lets you start the Xdm Chooser, a local ViewStation client that displays available Xdm hosts for users who select Indirect or Broadcast Xdm access.

Remote Hosts Menu

This menu sets host information for up to six remote hosts, specifying for each the host name and address and other host information, including FTP or TFTP selection and access. It also permits specification of a Local and a Remote Mount Directory for each host.

Domain Name Servers Menu

This menu lets you enter the addresses of the one or two hosts to use to resolve Domain Names and the Default Suffix value for your network. There is also capability for internal name service.

User Preferences Menu

This menu allows you to set a number of user preferences, including fontpath and color map path information, keyboard and bell volume, screen saver settings, backing store and save under features, international keyboard type, and resolution and color depth settings for your monitor. This menu also allows you to enter a user password to give you Setup Mode security.

1.1.11 ViewStation Software

1.1.11.1 ViewStation Server Components

- Optimized version of the X Window System server, based on X11R5 effective with HDSware version 3.0.
- Multiple X11 extensions, both internal and downloadable
- Local Motif, OPEN LOOK, and FVWM Window Managers
- Local HDSterm VT320 emulation client (used for Telnet, Serial, and Console windows)
- Local ANSI terminal client (used optionally instead of HDSterm client)
- HDSperx downloadable clients (see Section 2.0)
- Setup Mode (configured as a local X client)
- ViewStation Console Window (configured as a local shell, a remote process, or serial connection)
- Available Memory Window (configured as a local X client)
- Low Memory Warning client (configured as a local X client)
- Downloadable RAM-based or flashPROM-based server operation
- Dynamic Font Loading and Font Server support
- XDMCP Protocol support including a local Xdm chooser client
- Multiple ViewStation clients running simultaneously (running locally or remotely as X clients)
- Downloadable Setup Mode configuration
- Point to Point Protocol (PPP) serial line connections
- Serial Line IP connections (SLIP)
- Compressed Serial Line IP connections (CSLIP)
- Downloadable RGB Colormaps
- Domain Name Service
- SNMP Network Management Protocol

1.1.11.2 Setup Mode

Setup Mode provides the ability to set many communication, network, and user preference settings. Using the "HDSware host" feature selects automatic entry of many needed paths in their Setup Mode fields. The Main Menu contains eight buttons for starting all the ViewStation clients:

Setup Mode Main Menu

- Telnet Terminal Window - local HDSterm client (with Run at Restart option)
- Serial Terminal Window - local HDSterm client (with Run at Restart option)
- Console Window client (with Run at Restart option)
- Available Memory client (with Run at Restart option)
- Motif Window Manager client (with Run at Restart option)
- HDSware Configuration - sets IP address and HDSware location

1.1.10.9 Serial Port - DB-25 Connector

An RS-423/RS-232 DB25 male connector with the following configuration:

PIN	SIGNAL
1	Chassis Ground
2	Transmit Data (output)
3	Receive Data (input)
4	Request To Send (output)
5	Clear To Send (input)
6	Not Used
7	Signal Ground
8	Not Used
20	Data Terminal Ready (output)
All other pins are not used.	
Shell	Protective Ground

Baud rates from 110 to 57.6 Kbaud are supported.

1.1.10.10 Sun Keyboard Connector

This is an 8-pin mini-DIN connector with the following configuration:

PIN	SIGNAL
1	Ground
2	Ground
3	Vcc
4	NC
5	Receive
6	Transmit
7	NC
8	Vcc

1.1.10.11 Audio Ports - Input/Output Connections

The Input and Output ports use 3.5 mm jacks. These jacks are only installed on the back panel if the Audio option is installed.

1.1.10.12 PC CardPort

The PC Card option requires the PC Card adapter card. This card has connectors for an internal HDS FlashPROM card and two PC Card devices, one internal and one with an external connection in the ViewStation’s back panel.

4	Not Used
5	Not Used
6	Receive Data -
7	Not Used
8	Not Used

Note that the ViewStation uses the standard Twisted-Pair interface of an unshielded 100 Ohm cable termination as its default setting. If you are using a shielded 150 Ohm cable termination, you should select jumpers 1-2 on JP15.

If your Twisted-Pair network does not use Link Integrity, you have two methods of disabling this on the ViewStation. Jumpers 1-2 on JP16 selects software specification of the Link Integrity setting, with the "Thin" setting enabling Link Integrity and the "Thick" setting disabling it. If you select jumpers 3-4 on JP17, this disables Link Integrity on the circuit board and is independent of the software setting.

1.1.10.7 ThinWire Ethernet - BNC Connector

A BNC female connector conforming to IEEE 802.3 10Base2 standards.

1.1.10.8 ThickWire Ethernet - DB15 Connector

A 15-pin female DB15 connector conforming to IEEE 802.3 10Base5 standards with the following configuration:

PIN	SIGNAL
1	Control In Circuit Shield
2	Control In Circuit A
3	Data Out Circuit A
4	Data In Circuit Shield
5	Data In Circuit A
6	Voltage Common
7	Not Used
8	Option Shield
9	Control In Circuit B
10	Data Out Circuit B
11	Data Out Circuit Shield
12	Data In Circuit B
13	Voltage Plus
14	Voltage Shield
15	Not Used
Shell	Protective Ground

16	INIT (output)
17	Select In (output)
18	Logic Ground
19	Logic Ground
20	Logic Ground
21	Logic Ground
22	Logic Ground
23	Logic Ground
24	Logic Ground
25	Logic Ground

1.1.10.5 Video Connector - DB15 high-density (VGA-type)

A 15-pin high-density female DB15 connector having the following configuration:

PIN	SIGNAL
1	Red
2	Green
3	Blue
4	Not Used
5	Ground
6	Red Return
7	Green Return
8	Blue Return
9	Not Used
10	Ground
11	Not Used
12	Not Used
13	Horiz. Sync.
14	Vert. Sync.
15	Not Used

1.1.10.6 Twisted-Pair Ethernet - RJ45 Connector

An 8-pin connector conforming to IEEE 802.3 10BaseT standards with the following configuration (Pin 1 is on the left side of the opening):

PIN	SIGNAL
1	Transmit Data +
2	Transmit Data -
3	Receive Data +

Note: ViewStations which use the Sun keyboard option have a special connector for the keyboard. Older ViewStation models convert the RJ11 serial port for the Sun keyboard connection.

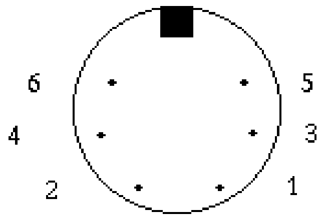
If the RJ11 port is used for a Sun-style keyboard connection, the pin assignments are different. The connection is reworked on the main circuit board so the serial port capability is disabled. The RJ11 port has a special label "Sun-style Kbd", which indicates this rework. **WARNING:** you will damage the Sun-style keyboard if you plug it into a normal RJ11 port without the keyboard rework. The following pin assignments are present for the RJ11 connector for a Sun keyboard connection:

PIN	SIGNAL
1	RTS (not used)
2	TX - Transmit Data (output)
3	+ 5 V
4	Ground
5	RX - Receive Data (input)
6	CTS (not used)

1.1.10.4 Parallel Port - DB25 Connector

A 25-pin bidirectional Centronics parallel port with a female DB25 connector having the following configuration:

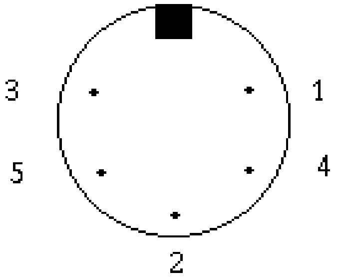
PIN	SIGNAL
1	Strobe (I/O)
2	Data 0 (I/O)
3	Data 1 (I/O)
4	Data 2 (I/O)
5	Data 3 (I/O)
6	Data 4 (I/O)
7	Data 5 (I/O)
8	Data 6 (I/O)
9	Data 7 (I/O)
10	ACK (input)
11	BUSY (input)
12	PE (input)
13	Select (input)
14	Auto Feed (output)
15	ERR (input)



PIN	SIGNAL
1	Data
2	Not Used
3	Ground
4	VCC
5	Clock
6	Not Used
Shell	Protective Ground

1.1.10.2 Keyboard Connector

A five-pin DIN female connector with the following configuration; pin assignments are shown:



PIN	SIGNAL
1	Keyboard Clock
2	Keyboard Data
3	Not Used
4	Ground
5	+5 VDC
Shell	Protective Ground

1.1.10.3 Serial Port - RJ11 Connector

A six-pin RS-423/RS-232 port using an unshielded female RJ11 connector with the following configuration: (Pin 6 is on the right edge of the connector)

PIN	SIGNAL
1	RTS
2	Transmit Data (output)
3	DTR
4	Ground
5	Receive Data (input)
6	CTS

Baud rates from 110 to 57.6 Kbaud are supported.

Weight: 3.75 lbs. (1.7 kg)

Sun Type 4 Keyboard: 1.64"h x 18"w x 8.1"d

Weight: 2.75 lbs.

Sun Type 5 Keyboard:

Lexmark 122 Keyboard:

1.1.7.3 ViewStation Pointing Devices

Mouse: 1.12"h x 2.75"w x 3.75"d (2.8cm. x 7cm. x 9.5cm.)

Weight: 3 oz. (0.1 kg)

1.1.7.4 ViewStation Monitors

Monitors: various models as shown above. Other monitors, such as flat-panel, rack-mounted, and energy-saving are also available.

1.1.8 ViewStation Environmental Requirements:

1.1.8.1 Operation

Temperature: 10 - 40 deg C (50 - 104 deg F)

Relative Humidity: 10 - 90%

Maximum Wet Bulb: 28 deg C (82 deg F)

Minimum Dew Point: 2 deg C (36 deg F)

Maximum Altitude: 2.4 km. (10,000 ft.)

1.1.8.2 Storage

Temperature: -15 - 70 deg C (5 - 158 deg F)

Relative Humidity: 5 - 95%

Maximum Altitude: 9.1 km. (30,000 ft.)

1.1.9 ViewStation Controls and Indicators

Base Unit: Front-mounted power switch, power LED.

Display Monitor: Brightness and Contrast controls, also other controls depending on the monitor.

Keyboard: Three LED indicators.

1.1.10 ViewStation Connections

The ViewStation has a number of connectors on the back panel. These are shown in detail below.

1.1.10.1 Mouse Connector

A six-pin mini DIN male connector with the following configuration; pin assignments are shown:

2. Cable Type:

The ViewStation base uses a DB-15 VGA-type connector for its video output, with standard VGA pin assignments, for all monitors. The ViewStation is shipped with a cable appropriate for the initial factory monitor type. Some monitors have attached cables, others use special connectors, or 1, 3, or 5 BNC connectors. It is important to check the cable type and verify the pin assignments when using a new monitor. The ViewStation’s video connector pin assignments are in Section 1.1.10.5 of this manual; consult the monitor manuals for the video connector signals needed on the monitor side.

3. Signal Frequency:

In order to support the high resolution of the monitors and give sufficient refresh speed to be free of flicker, ViewStation monitors run at relatively high signal frequencies (for example, IBM-PC VGA monitors run at 31.5 KHz, while ViewStation monitors typically run in the 70 KHz range). Specific monitor frequencies are given in the table above, and a supported frequency is selected by the hex-switch setting on the circuit board.

There are other considerations about the video signal that present additional compatibility problems. Consult with HDS Technical Support for more details on these differences. There are three main areas of signal compatibility beyond sync frequency; whether the monitor uses sync on green signals, the polarity of the sync signal, and grey-scale/color mappings.

If you want to change the monitor on your ViewStation base, verify that there is sufficient VRAM to support the desired resolution, verify the correctness of the video cabling, and select the correct signal frequency in the ViewStation.

Selecting the hex-switch setting:

Disconnect the power to your ViewStation and remove the base’s cover. A small round switch with numbers 0 to F on the top is located toward the left rear of the circuit board. Simply turn the white dot to the desired setting. Be sure to cycle the power to both the ViewStation and the monitor any time you change this setting.

Be careful in selecting the switch setting - you can damage the monitor if you select the wrong cable or setting. HDS cannot accept responsibility for unsupported monitors or configurations.

1.1.7 ViewStation Physical Characteristics

1.1.7.1 ViewStation Base Unit

Base Unit: 1.75"h x 13.5"w x 12.5"d (4.4cm. x 34.3cm. x 31.7cm.)

Weight: 7.5 lbs. (3.4 kg)

1.1.7.2 ViewStation Keyboards

IBM Keyboard: 1.4"h x 18.25"w x 8.25"d (3.5cm. x 46cm. x 21cm.)

Weight: 2.6 lbs. (1.2 kg)

DEC Keyboard: 1.5"h x 19"w x 8.25"d (3.5cm. x 48.5cm. x 21 cm.)

14″ Color	MO-14CS	1024x768	57 KHz/71 Hz	5
15″ Color	MO-15CS	1024x768	57 KHz/71 Hz	5
17″ Color	MO-V17CT/CH	1280x1024	65 KHz/71 Hz	3
17″ Color (Trinitron)	MO-V17CTN	1280x1024	76 KHz/72 Hz	7
19″ Color (Invar)	MO-V19CS/Ci	1280x1024	77 KHz/72 Hz	7
19″ Color (Trinitron)	MO-19CT	1280x1024	77 KHz/72 Hz	7
ViewStation Monitors no longer shipping				
19″ Color (Trinitron)	MO-V19C	1280x1024	64 KHz/61 Hz	0
19″ Monochrome	MO-V19MM	1280x1024	68 KHz/64 Hz	1
17″ Monochrome	MO-V17M	1024x864	67 KHz/74 Hz	2
16″ Color	MO-V16C	1024x864	65 KHz/71 Hz	3 *
14″ Color	MO-V14C	1024x768	57 KHz/71 Hz	5
14″ Monochrome	MO-V14R	1024x768	57 KHz/71 Hz	5 *
19″ Monochrome	MO-19MS	1152x900	64 KHz/68 Hz	6
VGA (needs factory modification)		640x480		8
VGA (needs factory modification)		800x600		9

The ViewStation produces video signals with separate sync signals or composite sync on green. Selecting JP12 3-4 on the ViewStation FX (JP 13 on the LX series, and JP13 on the Ultra series) turns off the sync on green signal (hex switch 5 video automatically shuts off sync on green).

The ViewStation uses negative polarity for its video signals. You can select positive polarity with jumpers on the main board in JP9 for the ViewStation FX (JP12 for the LX series, and JP 11 for the Ultra series), which is located near the round hex switch. To select positive polarity:

HSYNC - install jumper 1-2

VSYNC - install jumper 3-4

All monochrome monitors select grey-scale operation automatically, except the MO-V14R, which requires JP13 5-6.

1.1.6.2 Changing ViewStation Monitors

There are several considerations with changing monitors on the ViewStation.

1. Video memory:

The ViewStation can have either 1 MB or 2 MB VRAM configurations, based on its initial factory monitor type. The 1 MB configuration supports monochrome monitors at all resolutions up to 1280x1024 and color (and grey-scale) monitors at 1024x768 resolution. Higher resolution color (or grey-scale) monitors require the 2 MB VRAM configuration; this is a factory upgrade to the ViewStation base. You can see the memory available on your ViewStation by using the “hwconfig” command from the ViewStation’s Console Window.

Weight: 27 lbs.
Frequency: 57 kHz horiz.; 70 Hz vertical

- LX15C, FX15C, Ultra 15C - 15" color monitor
  Resolution - 1024x768 pixels; 256 colors
  Size: 14.2"W x 14.9"H x 15"D
  Weight: 29 lbs.
  Frequency: 57 kHz horiz.; 70 Hz vertical
- LX17C, FX17C, Ultra 17C - 17″ color monitor
  Resolution - 1024x864 pixels; 85x85 dpi; 256 colors
  Resolution - 1152x900 pixels; 93x93 dpi; 256 colors
  Size: 16.75"W x 16.75"H x 18.1"D
  Weight: 55 lbs.
  Frequency: 65 kHz horiz; 71 Hz vertical
- FX17CT, Ultra 17CT - 17" Trinitron color monitor
  Resolution - 1024x864 pixels; 85x85 dpi; 256 colors
  Resolution - 1152x900 pixels; 93x93 dpi; 256 colors
  Resolution - 1280x1024 pixels; 100x100 dpi; 256 colors
  Size: 16"W x 16"H x 17.3"D
  Weight: 47 lbs.
  Frequency:76 kHz horiz; 72 Hz vertical
- FX19CT, Ultra 19CT - 19" Trinitron color monitor
  Resolution - 1152x900 pixels; 93x93 dpi; 256 colors
  Resolution - 1280x1024 pixels; 100x100 dpi; 256 colors
  Size: 18.9"W x 19.3"H x 20.7"D
  Weight: 80 lbs.
  Frequency: 77 kHz horiz.; 79/72 Hz vertical
- LX19C, FX19Ci, Ultra 19Ci - 19" Invar-mask color monitor
  Resolution - 1152x900 pixels; 93x93 dpi; 256 colors
  Resolution - 1280x1024 pixels; 100x100 dpi; 256 colors
  Size: 19.7"W x 18.5"H x 19.9"D
  Weight: 64 lbs.
  Frequency: 77 kHz horiz.; 79/72 Hz vertical

1.1.6.1 Selecting the Monitor Type

The following table shows monitors currently supported by HDS. Monochrome and grey-scale monitors typically differ only in the amount of VRAM present. Note that the sync frequency varies with the resolution (which is user-selectable) of the monitor; the values below are the HDS factory setting. Some multi-sync monitors have a frequency shown which is the HDS factory specification appropriate for optimum display characteristics. * indicates a jumper is needed.

ViewStation Model	Monitor Number	Resolution	Sync. Freq.	Hex Setting
15″ Monochrome	MO-V15M	1024x864	65 KHz/72 Hz	4
17″ Monochrome	MO-V17H	1152x900	76 KHz/72 Hz	F
19″ Monochrome	MO-19M	1280x1024	77 KHz/72 Hz	F

- Three-button opto-mechanical PS/2 style mouse which uses a six-pin mini DIN connector.
- A serial mouse and other serial devices can be used on the ViewStation. Serial devices are automatically sensed on the serial ports and the appropriate drivers used.
- Trackballs in a number of configurations
- Light pen, FTG Data Systems, IBM F10 and MAC F11 Model PXL-780
- Other devices, such as bar code readers, digitizing tablets, etc. can be used with the serial ports and the HDSware software "opendev" and "usepty" commands.

1.1.6 ViewStation Display Monitors

The ViewStation supports a number of different monitors, in sizes from 14" to 35". The resolution and color depth of the monitors are selectable in Setup Mode (up to the limits of the installed VRAM). This list is subject to change without notice.

- FX14 - 14" monochrome/gray-scale monitor
  gray-scale is selected for this monitor with JP12 5-6
  Resolution - 1024x768 pixels, 100x100 dpi; 1 or 256 shades
  Size - 12.6"W x 13.4"H x 12.5"D
  Weight - 16 lbs.
  Frequency - 57 KHz horiz.; 70 Hz vert.
- FX15 - 15" monochrome/gray-scale monitor
  Resolution - 1024x864 pixels; 100x100 dpi; 1 or 256 shades
  Resolution - 1024x800 pixels; 100x100 dpi; 1 or 256 shades
  Size - 14.2"W x 14.4"H x 14.8"D
  Weight - 25 lbs.
  Frequency: 64 KHz horiz.; 72 Hz vert.
- FX17 - 17" monochrome/gray-scale monitor
  Resolution - 1024x864 pixels; 85x85 dpi; 1 or 256 shades
  Resolution - 1152x900 pixels; 93x93 dpi; 1 or 256 shades
  Size - 16.2"W x 15.3"H x 17.1"D
  Weight - 44 lbs.
  Frequency: 68 KHz horiz.; 74 Hz vert.
- FX19M - 19" monochrome/gray-scale monitor
  Resolution - 1024x864 pixels; 85x85 dpi; 1 or 256 shades
  Resolution - 1152x900 pixels; 93x93 dpi; 1 or 256 shades
  Resolution - 1280x1024 pixels; 100x100 dpi; 1 or 256 shades
  Size - 18.5"W x 18.5"H x 16.0"D
  Weight - 53 lbs.
  Frequency: 77 KHz horiz.; 72 Hz vert.
- LX14C, FX14C, Ultra 14C - 14" color monitor
  1024x768 pixels; 100x100 dpi; 256 colors
  Size: 13.6"W x 13.7" H x 15"D

1.1.2.9 ViewStation PC Card Board

An optional PC Card interface board is available. This connects to the main circuit board on the connector for the FlashPROM, so you would use the connector for either FlashPROM or PC CardPC Card cards. The PC Card board has slots for two PC Card devices and one for a FlashPROM board. Typically, you could use one for a FlashPROM storage device for booting, one for an audio board, and the third for an optional communications connection.

1.1.2.10 ViewStation PC Card Devices

The PC Card interface (also called the PCMCIA interface) is a specification for both hardware and software interfaces. There are a number of PC Card devices currently supported and many more are being added.

Currently supported PC Card devices are:

ROM storage - 2.5 MB and 5.0 MB ROM cards

Hard disks - 20 MB and 40 MB hard disk drives

Audio card - HDSaudio, with input and output connectors

Token Ring communications interface - Token Ring network connectivity

1.1.2.11 ViewStation Floppy Disk Drive

The ViewStation supports a 3.5″ floppy disk drive using its parallel port. The installation and operation of the floppy disk drive are described in Section 1.12 of this manual.

1.1.3 ViewStation Power Supply

The internal power supply is switching-type and is rated at 40 W. It automatically detects and accepts either 120 VAC or 240 VAC line voltage. The convenience outlet on the back panel provides the same voltage output as the voltage input.

1.1.4 ViewStation Keyboards

The ViewStation supports a number of different keyboards, shown below:

- IBM 101+ style keyboard (AT type) - this is the standard keyboard
- DEC style (VT420 type)
- Sun Type 4 style or Type 5 style (using either Serial Port 1 with special modifications for older ViewStations) or with a Sun keyboard connector on FXD and Ultra ViewStation models
- IBM 102 key multinational keyboard
- Lexmark 122 key IBM 3270 keyboard

All keyboards (except Sun) use a five-pin DIN male connector with an IBM interface. Complete key remappings and configurations are selectable from software.

1.1.5 ViewStation Mouse and Pointing Devices

The ViewStation supports a number of pointing devices:

of DRAM sockets which accept 0, 2, 4, 8, 16, 32, or 64 MB SIMM modules (some boards also have 4 MB of memory on the main board). Various combinations of these values are available.

Optional flashPROM memory and other storage devices for the server code is available. Booting is done with a PLCC boot prom, either 2 or 4 Mb; or from memory allocated for the bootprom on the flashPROM board. The board also contains an 8 KB Non Volatile Memory chip.

The ViewStation with the FXA/B/C/D circuit boards can accept SIMM modules in any mixture. The ViewStation Ultra must use SIMM modules as identical pairs of SIMMs.

ViewStation memory uses standard 32-bit wide SIMM modules with speeds 70 ns or faster. The 72-pin SIMMs should have tin-lead contacts. These can be ordered from HDS or obtained from other market sources.

1.1.2.4 ViewStation Bootprom

The ViewStation uses a PLCC boot prom or a dedicated memory partition on the FlashPROM board (jumper selectable) for easy upgrades. The bootprom has 2 Mb capacity. There is an optional bootprom (Vnn-E) available with 4 Mb capacity for Token Ring network operation.

1.1.2.5 ViewStation Video Memory

Video memory supports resolutions up to 1280x1024 pixels, with 1 or 8 bit planes of depth. Memory is installed as either 1 MB or 2 MB, depending on the monitor requirements. Color handling is done with a TI TLC34075 palette chip and supports 8 bitplanes of color, 256 colors from a palette of 16.7 million.

1.1.2.6 ViewStation External Connections

The main circuit board has ports for the video connector, the mouse and keyboard, as well as a Centronics parallel port (DB25 connector) for local printing, an RS232 serial port (RJ11 connector), and a Twisted-pair Ethernet port (RJ45 connector). Some boards also have an optional separate connector for a Sun keyboard.

1.1.2.7 ViewStation Optional Communications Board

An optional communications board may be added. This board contains a ThinWire Ethernet port (BNC connector), a ThickWire Ethernet port (DB15 connector), and a second RS232 serial port (DB25 connector).

1.1.2.8 ViewStation FlashPROM Board

An optional FlashPROM board is available with 2.0 MB or 4.0 MB of flash ROM memory. This board stores the ViewStation's server code, and optionally, the bootprom software for local booting. The ROM memory can be easily reprogrammed for server code updates (refer to Section 1.4.7).

HDS ViewStation: Specifications

This chapter gives the hardware and software specifications for the HDS ViewStation.

1.0 Section 1.0 - HDS ViewStation

1.1 HDS ViewStation Specifications

1.1.1 HDS ViewStation Overview

The HDS ViewStation is a modular X Window System terminal composed of a base unit, a keyboard, a mouse, and a display monitor.

The ViewStation uses standard components for its keyboard, mouse, and monitor. Other devices using the same specifications can be substituted. See the sections below for some supported devices.

1.1.2 Hardware Specifications

1.1.2.1 ViewStation Base Unit

The ViewStation's base unit contains a highly integrated main circuit board and a power supply. These are described individually below.

1.1.2.2 ViewStation Circuit Board

The main circuit board contains the main processor, an Intel 80960CA RISC processor. Various processor speeds are supported, including 16, 25, and 33 MHz. The main circuit board also contains a high performance Ethernet controller, the Intel 82596CA processor.

1.1.2.3 ViewStation Memory

The ViewStation main circuit board contains memory of up to 132 MB of DRAM memory, depending on the density of the memory modules. The memory consists