4. Start the ViewStation’s window manager by rsh command from the host.

```
rsh -n <ViewStation name> olvwm '&'
```

If you want to use the Motif Window Manager, you can also run that on the ViewStation. All of the considerations above apply to Mwm, especially environments and resource files, including *.mwmrc*.

Start Mwm with:

```
rsh -n <ViewStation name> mwm '&'
```

Note that this technique preserves system security because the ViewStation can only rsh to the host that initiated the rsh command (and hosts specifically permitted by the */hosts.equiv* file). The ViewStation cannot rsh without the proper transfer of user names, permissions, and environments by means of the initial rsh. In this way, the ViewStation has no less security than the logon user and the initial rsh host; this process simply extends or limits access to other permitted host machines.

```
set path=( $OPENWIN/bin  $OPENWINHOME/bin/xview  $path )
```

On Sun workstations, X11R5 is usually built with shared libraries in order to save space. These libraries have the same names as some of the Openwin shared libraries. You may notice that running a program compiled with the X11R5 libraries from the OPEN LOOK window manager sometimes displays various Xview error messages on the Sun console indicating that there are incorrect library versions. These messages can be ignored.

The OPEN LOOK window manager can be run from the Sun host or can be run locally on the HDS ViewStation (this is an official v3.0 OPEN LOOK Virtual Window Manager so its operation is identical to the Sun based OLWM; HDSware version 3.2 uses OPEN LOOK Window Manager version 4.0).

When the environment variables are set correctly, as shown above, you can start the OPEN LOOK window manager on the Sun to display on the ViewStation. Make sure the ViewStation DISPLAY variable is correctly entered.

The OPEN LOOK Virtual Window Manager runs locally on the ViewStation to distribute the processing load so you can save Sun memory and CPU power for other applications. The OLVWM behaves identically with the OLWM except that it permits an extended screen on a Virtual Desktop. This is an extension of the real screen to a tiled array of screens. The Virtual Desktop permits the user to locate windows in an off-screen tile and move to them by clicking in the appropriate Virtual Desktop tile.

4.1.7 OLWM Window Manager

There are two ways to run OLVWM on the ViewStation.

- The first way is to click on the OLWM button in Setup Mode's Main Menu. This reads the resources and menus you have specified in the ViewStation's OLWM files. The ViewStation's local HDSperx clients are added to the root menu automatically.
- The second way is to start the ViewStation's OLWM by means of a remote shell process from the Sun host. This technique has the advantage of letting the ViewStation's OLWM read the resource and menu files as they are configured on the Sun host. This technique is discussed in Section 2.5.2.

These steps are necessary:

1. Put the ViewStation's name and IP address in the */etc/hosts* file.

2. Put the ViewStation's name in the */etc/hosts.equiv* file. Use this file to govern ViewStation access to other hosts. Alternately, you may wish to use the user's *$HOME/.rhosts* file. The ViewStation would then have the same security access and limitations as the host machine executing the initial rsh command to the ViewStation.

3. Make sure appropriate environments, paths, etc. (in the environment section above) are available in the user's *.cshrc* or *.profile* files. Paths to the appropriate resource files and the *.openwin-menu* file should also be available. The rsh command looks for these variables in that location.

- Check the transfer block size. The ViewStation uses a 8192 byte block size by default. If 8192 is too large for your network environment, you must set the correct value in the ViewStation’s configuration file, which is */hds-fx/config/config.fx*. The ViewStation resource is:

```
HDSsetup.NFS.block.size: 8192 (permitted values are 128 to 8192)
```

- Finally, run the command to export the filesystem:

```
shareall
```

Check your system NFS man pages for more details and arguments.

4.1.5 Other Network Services

There are several other important network services you may need, depending on the starting mechanism you have chosen.

4.1.5.1 BOOTP (Boot Protocol Daemon)

The BOOTP daemon is used by the ViewStation for determining the ViewStation IP address, downloading server code, setting gateway addresses, setting passwords, etc. These are optional features, but often important in large installations. Again, the BOOTP daemon is usually present but often not started at installation. Check the */etc/inetd.conf* file to start BOOTP. If you want to use these ViewStation features, check that BOOTP is installed and running. Make the appropriate entries in the */etc/bootptab* file.

4.1.5.2 RARP (Reverse Address Resolution Protocol)

The RARP protocol may be used to determine the ViewStation IP address. This utility is generally not present on Sun systems and is replaced by NIS (Network Information Service), formerly called the Sun "Yellow Pages". Refer to the Sun documentation on the NIS utility if you want to use it, but note that the RARP files */etc/hosts* and */etc/ethers* are replaced by the NIS maps. There are Sun utilities, found in */var/yp*, to convert existing RARP */etc/hosts* and */etc/ethers* configuration files to their corresponding NIS files.

4.1.6 Open Windows Applications

Open Windows applications use special environments and configuration files for their operation, including special path names and environment variables. Use the sample file below to set the required variables for the OPEN LOOK Window Manager, **olwm**, substituting the appropriate directories and paths on your Sun host. These entries should be in the ViewStation user’s *.cshrc* or *.profile* file.

4.1.6.1 Open Windows Environments

These Open Windows environment variables should be set:

```
setenv OPENWINHOME  /usr/openwin
setenv LD_LIBRARY_PATH  $OPENWINHOME/lib
setenv X11ONLY=YES
setenv MANPATH  $OPENWINHOME/share/man:/usr/man
```

In this case, as with "secure TFTP" above (see Section 4.1.2.2), you must understand how these security mechanisms affect the entry of the HDSware path on the ViewStation. Your path on the ViewStation must take into account the new anonymous ftp root directory.

4.1.4 NFS File Transfer Protocol

NFS allows the ViewStation to perform transparent file access over the network. The ViewStation dynamically mounts the filesystem and then transfers the file; it does not use a static mount. The HDSware tape may be loaded on any filesystem on any host available to the ViewStation.

There are two ways to handle NFS processes - one for Sun OS 4.1.x (or BSD types) and one for Solaris 2.x (or Sys V R4.x types). The NFS functions are the same, but the syntax and file names are different.

For Sun OS 4.1.x and BSD type UNIX:

To use NFS, you must export the filesystems and/or directories the ViewStation requires. For example, suppose you loaded the HDSware tape in the */home/HDS* filesystem and wanted to use NFS as your file transfer protocol.

- First, verify that the */home/HDS* directory is listed in the */etc/exports* file.

- If filesystem access needs to be restricted to the ViewStation, add the ViewStation's name to the access list for the desired filesystem. For example (in the */etc/exports* file):

```
/home/HDS                    -access=hdssun5:hdsfx2
```

Thus, only hdssun5 and hdsfx2 have mount privileges to the */home/HDS* filesystem. A read-only flag may also be added for these hosts' access permission.

```
/home/HDS                    -access=hdssun5:hdsfx2, ro
```

- Check the transfer block size. The ViewStation uses a 8192 byte block size by default. If 8192 is too large for your network environment, you must set the correct value in the ViewStation's configuration file, which is */hds-fx/config/config.fx*. The ViewStation resource is:

HDSsetup.NFS.block.size: 8192 *(permitted values are 128 to 8192)*

- Finally, run the command to export the filesystem:

```
exportfs -a
```

Check your system NFS man pages for more details and arguments.

For Solaris 2.x and Sys V R4.x type UNIX:

To use NFS, you must export the filesystems and/or directories the ViewStation requires. For example, suppose you loaded the HDSware tape in the */home/HDS* filesystem.

- First, add this line to the */etc/dfs/dfstab* file.

```
share -F nfs -oro -d "For HDS X Terminals" /home/HDS
```

Note that this line sets "read-only" permission, and has a "-d" comment line argument.

```
cp -r /tftpboot  /usr
rm -rf  /tftpboot
ln -s  /usr/tftpboot  /tftpboot
```

4.1.2.2 Paths with Secure TFTP

If you use Secure TFTP, note that any TFTP request does a change directory command to the secure directory, usually */tftpboot*, and this directory is automatically prepended to your path. This means that your path should not contain the */tftpboot* directory, since it will be added automatically.

If your server code file is in */tftpboot/HDSware/hds-fx/image/Vnn.hds*, for example, your HDSware path should be entered as */HDSware* only, not */tftpboot/HDSware*.

4.1.3 FTP File Transfer Protocol

FTP is normally included with the Sun software, but it is often not started with the Sun installation; refer to the */etc/inetd.conf* file for FTP as above. You should check to see if the FTP daemon is running; check for a comment character on the FTP line in the */inetd.conf* file. The following line should be present in the */etc/inetd.conf* file.

```
ftp  stream  tcp  nowait  root    /usr/etc/in.ftpd    in.ftpd
```

Follow the example above if you need to restart the inetd process.

FTP requires a valid username and a real password to run, so the appropriate accounts should be set up on the Sun (normal login accounts and passwords are sufficient, but they must be entered in the ViewStation’s Setup Mode Remote Hosts fields to be used for file loading).

FTP also verifies the user’s shell with the *getusershell()* query to the */etc/shells* file. Sun does not create this file in normal installation. Unix System V Release 4 replaces the Bourne shell (*sh*) with the Korn shell (*ksh*) as the standard shell. If the Korn shell is not added to the */etc/shells* file, or this file doesn’t exist, the query detects the Korn shell as invalid and the FTP request is denied. If you are using the Korn shell, you must make these changes.

4.1.3.1 Anonymous FTP File Transfer

Anonymous FTP file transfers do not require a password, but have other security limitations. All files to be transferred must be in a special anonymous FTP directory.

Refer to your man pages for details about setting up an anonymous FTP account. In summary, you must enter a “anonymous ftp” user in the password file (*/etc/passwd*) with appropriate group and ownership limitations, and then use that anonymous ftp user’s home directory as the root directory for file transfers. Anonymous FTP file transfers initiate a chroot() call, so the new root directory is the home directory for the anonymous ftp user.

transfer protocol. You can select another protocol by changing the entry in the Remote Hosts menu of Setup Mode.

4.1.2 TFTP File Transfer Protocol

Typical Sun installations do not start TFTP. This is the ViewStation’s default protocol. A startup line for TFTP is present in the */etc/inetd.conf* file, but is usually commented out. With the comment character removed, the TFTP protocol is run in "secure" mode. If you want to run TFTP as your file transfer protocol for the ViewStation, you must verify that it is running, and then decide if you want to use it in secure mode or not.

To start your TFTP service on the Sun (you must be root user to do these steps):

1. Check to see if TFTP was started. Look in the */etc/inetd.conf* file to see if the TFTP line has a comment character. The line looks like this:

```
#tftp   dgram   udp   wait   root    /usr/etc/in.tftpd    in.tftpd   -s   /tftpboot
```

2. Remove the comment character (#) from the beginning of the line.

3. Restart the inetd process. Find the process identification number (PID) from the following command:

```
ps -aux | grep inetd
```

Then issue this command:

```
kill -1 <PID>
```

This restarts the inetd process and starts the TFTP daemon.

4.1.2.1 TFTP in Secure Mode

If the TFTP process is in secure mode (check for the "-s /tftpboot" at the end of the line), the TFTP process must change to the */tftpboot* directory to move requested files. If your files are not in that directory, or you don’t want to put them there, or you want to transfer files from other directories, you will have to make some changes.

You have several options:

- **Use secure TFTP** - this means that all your files must be located in the */tftpboot* directory. This partition is usually fairly small, so check the available storage space with the "df" command. The HDSware tape requires about 21 MB for a complete installation, or about 9 MB for a minimal installation.

  Note that the Sun pre-pends */tftpboot* to whatever directory you specify in your paths, so take this into account when you enter your HDSware path.

- **Use unsecure TFTP** - remove "-s /tftpboot" from the TFTP line and restart the inet daemon. This means that TFTP is not secure and can move files from or to any directory on the system. This is convenient, but you may want to keep the security features.

- **Link your files to */tftpboot*** - for instance, you could create a tftpboot directory in your */usr* partition, */usr/tftpboot*, and link it to */tftpboot*, as follows:

Using the ViewStation on Selected Host Systems

This chapter will help you connect an HDS ViewStation to a Sun host system.

4.0 Section 4.0 - Using the ViewStation on Selected Host Systems

4.1 Sun Workstation Configuration

Each Sun workstation will have a slightly different configuration, depending on the software present on the system and its installation. These suggestions rely on the standard configuration and file location on Sun systems.

There are two basic sections of interest:

- Sun Network Services
    - TFTP protocol
    - FTP protocol
    - NFS protocol
    - Other network services
- Sun Open Windows Applications
    - Open Windows Environment
    - OLWM - on the Sun
    - OLVWM - on the ViewStation

4.1.1 Sun Network Services

The ViewStation uses either the TFTP, FTP, or NFS file transfer protocols to load fonts and local clients, so at least one of these programs (daemons) must be present and running on the Sun. The ViewStation uses TFTP as its default file