

# Analyze 3.1

## INSTALLATION INSTRUCTIONS

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## Welcome

Welcome to **Analyze 3.1**, a robust, powerful and practical research software suite for biomedical image visualization, manipulation and measurement. Analyze features integrated, complementary tools for fully interactive display, manipulation and measurement of multidimensional image data. It

can be used to visualize data from many different imaging modalities, including CT, MRI, PET, SPECT, ultrasound and digital microscopy.

Analyze is a comprehensive, integrated biomedical imaging visualization and analysis workshop. It provides functionality to address a broad range of problems and features solutions to some of the most important challenges in biomedical imaging research, including segmentation, classification, registration, and display. It has been designed and carefully programmed to be highly efficient and user-interactive, performing powerful 3-D image processing and display operations in seconds. Its applications are broad in scope, wide in scale and penetrating in impact. It is routinely used in a vast number of biomedical imaging research applications, and is used as an educational tool to teach anatomy and function to medical students and clinical trainees.

## Installing Analyze on Windows 95/98/NT/2000/Me

**Analyze 3.1** requires the following minimum PC configuration: an Intel Pentium or compatible processor; Windows 95, 98, NT 4.0, 2000 or Me; a network card; a CD ROM Drive; 64 MB Ram; 24/32-Bit Graphics capability; at least 50MB Disk Space; a 3-Button Mouse.

The following instructions explain how to install **Analyze 3.1**.

### 1. Obtaining a License File

**Before installation, you need to obtain a license file from AnalyzeDirect.** To generate the license file, AnalyzeDirect needs to receive specific network card related information from your PC. If you have not already done so, please send an e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com) with your name, company, telephone number and your PC network card Adapter Address. The Adapter Address is obtained as follows:

- **Adapter Address for Windows 95/98** - select 'Start' → 'Run', enter "winipcfg". In the IP configuration box the Adapter Address will appear in the 'Address' column. Please select the address that corresponds to your network card (i.e. not the PPP Adapter address)
- **Adapter Address for Windows NT** - select 'Start' → 'Programs' → 'Administrative Tools' → 'Windows NT Diagnostics'. Choose the 'Network' tab, then the 'Transports' button. The Adapter Address is in the 'Address' column. Some Windows NT setups do not have 'Administrative Tools' as a menu choice. If this is the case for your system, please follow the instructions for Windows 2000/Me.
- **Adapter Address for Windows 2000/Me** - open an MS-DOS shell window and type 'ipconfig -all' in the MS-DOS shell window. The Adapter Address is in the 'Physical Address' field column. Please select the address that corresponds to your network card (i.e. not the PPP Adapter address)

When you send us this information (Adapter Address, name, company, telephone number), AnalyzeDirect will send a license file to you by e-mail. The name of the license file is **AnalyzePC.dat**. We recommend that you wait until you receive the **AnalyzePC.dat** license file before commencing installation.

## 2. System Preparation

### Disk Space

Ensure that the system on which you will be installing this software and data has adequate free disk space. The disk space requirements are as follows:

	<b>Disk Space Requirements</b>		
<b>Section</b>	<b>Disk Space</b>	<b>Options</b>	
<b>Analyze</b> Runtime	59 Mb	Mandatory	
<b>Analyze</b> Tutorial Files	12 Mb	Optional	
<b>Analyze</b> Tutorial Data	129 Mb	Optional	
<b>AVW</b> Development Kit	7 Mb	Optional	
Sample <b>AVW</b> Code	1 Mb	Optional	
Sample <b>AVW</b> Data	17 Mb	Optional	

**Analyze Runtime** – includes Analyze programs, AVW libraries, help documentation, license management software, and other ancillary **Analyze** files.

**Analyze Tutorial Files** – includes the **Analyze** tutorial files in PDF format.

**Analyze Tutorial Data** – includes the **Analyze** tutorial related image data.

**AVW Development Kit** – includes AVW development files, AVW documentation  
(ANALYZE DEVELOPERS ADD-ON USERS ONLY)

**Sample AVW Code** – includes AVW example programs in C and Tcl.Tk. (ANALYZE DEVELOPERS ADD-ON USERS ONLY)

**Sample AVW Image Data** – includes image data used with AVW examples. (ANALYZE DEVELOPERS ADD-ON USERS ONLY)

### Uninstalling previous versions of Analyze

If the system on which **Analyze 3.1** is being installed has a resident copy of a previous version of **Analyze**, although this is optional, we recommend that you uninstall the previous version prior to installation of **Analyze 3.1**. Otherwise, make sure to choose a new installation directory for this version. To remove a previously installed version of **Analyze**, use the Windows **Add/Remove Programs** process from the **Control Panel** menu as follows:

- 1.) Click **Start**, point to **Settings**, click **Control Panel** and then double click **Add/Remove Programs**.
- 2.) On the **Install/Uninstall** tab, click **AnalyzePC** and then click **Add/Remove**.
- 3.) Click **Yes** to **Confirm File Deletion**.

This will remove the entire previous version of **Analyze** from your system.

### 3. Software Installation

The installation of **Analyze 3.1** is managed automatically by the **InstallShield** installation program. The **Analyze 3.1 Setup** process will lead you through a complete installation of the **Analyze 3.1** software system (including optional components that are not installed in a typical installation if desired). To begin the installation process:

- 1.) Start Windows 95, 98, NT 4.0, 2000 or Me on your system.
- 2.) Close all active programs on the desktop.
- 3.) Insert the **Analyze 3.1** CD into your CD-ROM drive.
- 4.) The **Analyze 3.1 Setup** process should automatically start. If not, click the **Start** button, click **Run**, and in the **Open** box enter the location of the **setup.exe** program on the CD (i.e., E:\setup). Then click **OK**.
- 5.) Once the **Analyze 3.1 Setup** process starts, follow the instructions that appear for the installation of the **Analyze 3.1** software.

### Analyze 3.1 Setup Notes

During the **Analyze Setup** process, the following information will need to be provided:

**User Information:** enter your **User Name** and **Organization** in the fields provided.

**Destination Folder:** the default location for installation of **Analyze** is **C:\BIR**, if the C: drive is the drive on which your Windows operating system is installed. The installation location can be changed to any valid drive and directory on the system if desired. Once selected, the **BIR** directory will be created at the specified location and the installation process will continue (BIR stands for Biomedical Imaging Resource, the organization at Mayo Clinic that develops Analyze). For the remainder of the installation instructions, we will assume you used C:\BIR as the destination folder.

**Setup Type:** you may choose from three different types of installation – **Analyze with Tutorials (Typical)**, **Analyze Only (Minimum)**, or **Analyze, Tutorials and Developers Add-On (Custom)**.

**Analyze with Tutorials (Typical):** installs the **Analyze** Runtime software files and the Tutorials and Tutorial image data (200 Mb).

**Analyze Only (Minimum):** installs only the **Analyze** Runtime software files (59 Mb).

**Analyze, Tutorials and Developers Add-On (Custom):** permits selection of the mandatory Analyze Runtime files and the five optional components that can be installed – Tutorial Files, Tutorial Data, AVW Development Kit, Sample AVW code and sample AVW data.

**(DEVELOPERS ADD-ON NOTE – if you plan to use the Analyze Developers Add-On,**

**Custom installation must be selected and the AVW Development Kit, Sample AVW Code and sample AVW Data boxes must be checked).**

**Program Folder:** the default program folder for installation of *Analyze 3.1* is a folder called **Mayo Clinic Analyze**. The **Analyze** icon (and associated executable program referenced by this icon) will be placed in this folder. If you wish, the **Analyze** icon can be placed in any other program folder.

## 4. License File Installation

*Analyze 3.1* uses the **FLEXlm** license management software system from GLOBEtrouter Software for system validation and runtime license administration. The **FLEXlm** license manager software is located in the C:\BIR\FLEXlm-7.0 directory. This directory contains a subdirectory called **licenses** (C:\BIR\FLEXlm-7.0\licenses) within which a default license file is provided, called **AnalyzePC.dat**.

**The default AnalyzePC.dat license file MUST BE REPLACED by an AnalyzePC.dat file specific to your system, otherwise Analyze 3.1 will not open!**

The **AnalyzePC.dat** license file specific to your system will be provided to you via email (as described in section 1. “Obtaining a license file”). With *Analyze 3.1*, two types of licenses are available: node locked licenses that allow Analyze to be accessed on one specific single system, and floating licenses that allow Analyze access to number of systems in a client/server environment. The **AnalyzePC.dat** license file contains encrypted information about the type of license file (node locked or floating), the system network card adapter address, and the license file expiration date.

### Installing a Node Locked License File

A node locked **AnalyzePC.dat** license file contains only the relevant validation information for one specific system on which *Analyze 3.1* will be run. In this case, license administration is handled entirely local to the specific system, with license file access automatically invoked when *Analyze 3.1* is executed. To install a node-locked license file, do the following:

1. Locate the **AnalyzePC.dat** license file (sent to you either by e-mail or by floppy disk)
2. Copy the **AnalyzePC.dat** file to the **C:\BIR\FLEXlm-7.0\licenses** directory. You will be asked if you wish to replace the default **AnalyzePC.dat** license file. Confirm this is what you wish to do by selecting “OK”.
3. Move on to the next section “Running Analyze 3.1”.

### Floating License File

A floating **AnalyzePC.dat** license file allows Analyze to be “floated” over a number of systems in a client/server environment.

(Important Note: a floating license file requires one additional piece of information to be provided to **AnalyzeDirect** to generate the license file: the Computer Name of the server system. To obtain

this information, go to the server system and select Start -> Settings -> Control Panel -> Network. Select the "Identification" tab. The Computer Name for the server system will be in the "Computer Name" field. Send this information to [validate@analyzedirect.com](mailto:validate@analyzedirect.com) in addition to the other information requested earlier in "Obtaining a License File").

The floating license file specifically contains information about the system that is designated as the license server system (the **FLEXlm** server) on which the license server process must be run, and the total number of licenses that are to be available via this floating license server. License administration is handled in a client/server architecture – the license server process runs on a specific server system and clients request licenses from this license server process in order to run **Analyze 3.1**. The **AnalyzePC.dat** license provided contains specific information on the server system in the first line of the file:

```
SERVER servername 001234567890
```

This line specifies the **FLEXlm** server information. The system established as the **FLEXlm** server will provide the pool of floating licenses. The server information on the first line in the file must reflect the proper server system Computer Name (servername in the above example) and the proper server Adapter Address (001234567890 in the above example).

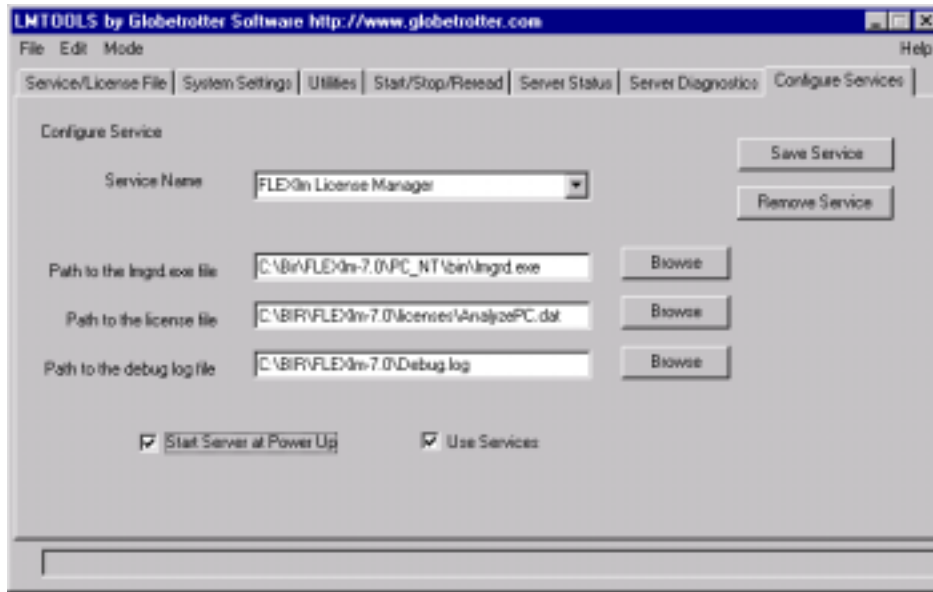
To install a floating license file, do the following:

1. Locate the **AnalyzePC.dat** license file (sent to you either by e-mail or by floppy disk)
2. Copy the **AnalyzePC.dat** file to the **C:\BIR\FLEXlm-7.0\licenses** directory. You will be asked if you wish to replace the default AnalyzePC.dat license file. Confirm this is what you wish to do by selecting "OK".
3. Configure the floating license file using the **lmtools.exe** program. Use My Computer to locate the program icon in the **C:\BIR\FLEXlm-7.0\PC\_NT\bin** directory and double click to open it. Once opened, click on the "Configuration using Services" option under the "Mode" menu bar item (or the "Configuration using Services" button on the Service/License File panel). Select the "Configure Services" tab and establish the three fields which point to the location of files necessary to run the license manager as follows:

**Path to the lmgrd.exe file** set to **C:\BIR\FLEXlm-7.0\Pc\_nt\bin\lmgrd.exe**

**Path to the License File** set to **C:\BIR\FLEXlm-7.0\licenses\AnalyzePC.dat**

**Path to the Debug Log File** set to **C:\BIR\FLEXlm-7.0\Debug.log**



Click the "Use Services" check button and select the "Start Server at Power Up" check button. Select the "Save Service" button.

Select the "Start/Stop/Reread" tab, then select the "Start Server" button. The floating license server should now be up and running.

4. Install Analyze on any clients which will access the floating license server, and install the AnalyzePC.dat license file in the C:\BIR\FLEXlm-7.0\licenses directory. Again you will be asked if you wish to replace the default AnalyzePC.dat license file. Confirm this is what you wish to do by selecting "OK". No additional configuration is required on the client machines.

5. Move on to the next section "Running Analyze 3.1".

The **FLEXlm License Manager** tool contains many other features used to start/stop the license manager process, get system information about the server system, and monitor the status of the license manager. Please refer the **FLEXlm** documentation available on Globetrotter's web pages ([www.globetrotter.com](http://www.globetrotter.com)) with regard to floating license management on PC systems for additional information.

## 5. Running Analyze 3.1

If you have completed the installation process and followed the instructions for setting up the various **Analyze 3.1** facilities, including the license installation, you are now ready to run the **Analyze 3.1** program (and may do so with the provided demonstration data)

### Running The Analyze 3.1 Program

To run **Analyze 3.1**, select the Analyze icon from the Mayo Clinic Analyze program group on the Start -> Programs menu (or from whatever program group in which you installed Analyze 3.1). This will invoke the Analyze 3.1 program.

## Analyze Basics

To quickly learn the basics of Analyze, we recommend that you work through the Analyze tutorials (shown under Help > Tutorials). The tutorials are in .pdf format and require Adobe Acrobat to read. For optimal tutorial viewing and printing quality, we recommend downloading the latest version of Acrobat from Adobe's website at [www.adobe.com/acrobat](http://www.adobe.com/acrobat).

The Analyze Users Guide is shown in html format under the Help > User Guide menu and requires a configured web browser to read. The "Special Section on Image I/O" contains a useful troubleshooting guide on loading image files into Analyze. Read in conjunction with the "Import and Export of Image Data" tutorial, these two resources provide answers to the most commonly asked Image loading questions.

Another good starting point is the Analyze Users Manual, which contains step by step instructions on how to use each Analyze module. This is not included on the AnalyzeCD, but the latest version of this can be downloaded in PDF format from our website at [www.analyzedirect.com/support/usersmanual](http://www.analyzedirect.com/support/usersmanual).

Of special note - **Analyze 3.1** does not automatically load all of the image file format support libraries that are possible with Analyze. This keeps module startup time to a minimum, loading only those image formats that you need to use with Analyze for your purposes. To configure your version of Analyze to load additional image file formats, use the Import/Export External Libraries tool. Consult the documentation mentioned above for more information if you encounter difficulties in importing or loading your image file format.

## 6. What to do when your license file expires

All Analyze license files have a built-in expiration date. For Analyze evaluators, this date is usually around 30 days after the license file was first sent. If you are an evaluator and you still wish to use Analyze following the expiration of your license file, please contact us at [validate@analyzedirect.com](mailto:validate@analyzedirect.com) to find out about purchasing options.

For Analyze customers, long-term Analyze license files are provided in 12-month increments. AnalyzeDirect contacts all customers and evaluators within the month prior to the expiration of the license file in advance of the expiration date to determine if the license file system information is still current. Once we receive system confirmation, a new license file will be sent by e-mail. If your licence file expires, and you have not yet received a new license file, please contact us at [validate@analyzedirect.com](mailto:validate@analyzedirect.com) to obtain your renewal license file.

## Installing a renewal node locked license file

To install a renewal node locked license file, do the following:

1. Locate the new **AnalyzePC.dat** license file (sent to you either by e-mail or by floppy disk)
2. Copy the **AnalyzePC.dat** file to the **C:\BIR\FLEXlm-7.0\licenses** directory. You will be asked if you wish to replace the expired AnalyzePC.dat license file. Confirm this is what you wish to do by selecting “OK”.
3. Analyze should now be ready to use.

## **Installing a renewal floating license file**

To install a renewal floating license file, do the following:

1. Locate the new **AnalyzePC.dat** license file (sent to you either by e-mail or by floppy disk)
2. Copy the **AnalyzePC.dat** file to the **C:\BIR\FLEXlm-7.0\licenses** directory on the FLEXlm server system, and on any client systems. You will be asked if you wish to replace the expired AnalyzePC.dat license file. Confirm this is what you wish to do by selecting “OK”.
3. Restart the server system.
4. Analyze should now be ready to use.

## **7. Analyze Developers Add-On Notes**

The Analyze developers add-on allows software developers to extend the capabilities of Analyze by developing their own macros and modules, using the AVW (A Visualization Workshop) image function library on which Analyze is built, and Tcl/Tk, the interface language used by Analyze. To get access to development capabilities, select “Custom” installation as the installation type, and check the “Development Files” box (See Analyze 3.1 setup notes above). The Developers Add-On also requires an AnalyzePC.dat license file that allows access to these development capabilities. By default, the license file ordering process outlined in section 1, Obtaining a License File, sends a license file that does not give development access – please indicate that you need a Developers Add-On license file when you send your e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com).

The Developers Add-On assumes you're familiar with programming in the C and Tcl programming environment. If you want to know more about Tcl programming we recommend starting with the 'Bible' of Tcl/Tk - "Practical Programming in Tcl and Tk" by Brent Welch. This comes with a CD that you can load on to your computer which includes a full Tcl/Tk implementation and many examples.

The AVW Programmers Guide and AVW Reference Manual can be found in the C:\BIR\AVW-3.1\Manuals directory, or can be downloaded in PDF format from our website at [www.analyzedirect.com/support/downloads](http://www.analyzedirect.com/support/downloads).

The best place to start practicing AVW-based Tcl/Tk is in the examples provided in the C:\BIR\AVW-3.1\extras directory. Here you will find a number of example source files, both in C and in Tcl/Tk, for common Analyze imaging tasks (like rendering, segmentation, etc.). The .tcl scripts contained in these subdirectories are full source code scripts which are able to be run, but you do need the Tcl/Tk environment set up such that these scripts can find the Tcl/Tk files needed to execute. There are .bat scripts included in the /BIR/bin directory which will invoke **tclsh** and/or **wish** with a given script file and will set all of the necessary environment variables to make this work. The tclsh.bat and wish.bat files are for Windows NT systems only. You should use these as examples to make sure everything is set up before running any of the Tcl/Tk scripts.

## 8. Support

For support related issues, please send an e-mail to the AnalyzeDirect support team at support@analyzedirect.com. Maintenance agreements which include access to support and upgrades can be purchased directly from the AnalyzeDirect website at www.analyzedirect.com.

## 9. Installed Software Organization (Windows)

When **Analyze 3.1** has been installed on your Windows system, the software organization in the installation directory (named BIR by default) will contain the following subdirectories and files (dependent on type of installation):

- **AnalyzeAVW-3.1:** *Analyze 3.1* programs, help documents and ancillary files
  - **AnalyzeTutorials:** *Analyze 3.1* Tutorial documentation in PDF format
  - **app-defaults:** Default settings for individual *Analyze 3.1* programs
  - **bin:** Executable *Analyze 3.1* programs
  - **BitMaps:** bitmap files used for *Analyze 3.1* icons
  - **HelpDocs:** HTML-based on-line help documentation for *Analyze 3.1*
  - **lib:** Functions for specific routines and widgets which support *Analyze 3.1*
  - **PC\_NT:** shared *Analyze 3.1* libraries and executable binaries for PC systems
  - **COPYRIGHT:** Copyright notice information for *Analyze 3.1* software system
  - **LicenseAgreement:** License agreement notice for *Analyze 3.1* software system
  
- **AVW-3.1:** The *AVW* libraries and development environment
  - **COPYRIGHT:** Copyright notice information for the *AVW* libraries
  - **License Agreement:** License agreement notice for the *AVW* libraries
  - **Manuals:** PDF copies of the *AVW* Programmers Guide and Reference Manual
  - **PC\_NT:** Shared *AVW* libraries and executable binaries for PC systems
  - **app-defaults:** Default settings for *AVW* functions
  - **develop\_env:** initialization script to support *AVW*-based software development
  - **extras:** Example programs to support *AVW*-based software development
  - **include:** Include files (.h) for *AVW*-based software development
  - **man:** Manual pages in html format for all *AVW* library functions
  
- **FLEXlm-7.0:** FLEXlm license manager files for *Analyze 3.1* system license administration
  - **HTMLMAN:** Help for FlexLM license file administration

- **Licenses:** folder where the AnalyzePC.dat license file is located.
- **PC\_NT:** License management tools and Sentinel dongle drivers
- **PublishSpool:** Files to support the *Analyze 3.1* printing mechanism.
- **SPM99-AAVW:** Files to link *Analyze 3.1* and SPM99 to allow direct image file sharing
- **TCL-TK8.3:** Interpreted language upon which *Analyze 3.1* is built (public domain)
- **bin:** Executable scripts for starting *Analyze 3.1*
- **ghost4.03:** Implementation of ghostscript used for printing support (public domain)
  - **images:** *Analyze 3.1* Tutorial image data and AVW 'extras' image data

## Installing Analyze on Unix and Linux Systems

*Analyze 3.1* runs on Sun Microsystems, Silicon Graphics, DEC Alpha, Hewlett Packard and IBM Unix Systems, as well as PC-based Linux systems.

The following instructions explain how to install *Analyze 3.1* on a Unix or Linux system.

### 1. Obtaining a License File

**Before installation, you need to obtain a license file from AnalyzeDirect.** To generate the license file, AnalyzeDirect needs to receive specific system information from your Unix or Linux workstation. If you have not already done so, please send an e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com) with your name, company, telephone number and the TWO pieces of system information we require to generate your license file: the workstation HOSTNAME and the workstation SYSTEM ID.

To get the **HOSTNAME** please do the following: Type the command "uname -n"

To get the **SYSTEM ID** different instructions are followed depending on which kind of workstation you are using:

SGI systems: Type the command "sysinfo -s" and report the returned decimal number

Sun systems: Type the command "hostid" and report the returned hexadecimal number

HP systems: Type the command "uname -i" and report the returned number

IBM systems: ID: Type the command "uname -m" and report the returned number

DEC systems: Type the command "netstat -i" and report the colon separated number shown in the "Address" field

PC-Based Linux systems: type the command “/sbin/ifconfig eth0” and report the hexadecimal number in the HWaddr field.

When you send us this information (hostname, systemid, name, company, telephone number), AnalyzeDirect will send a license file to you by e-mail. The name of the license file is **AnalyzeAVW.dat**. We recommend that you wait until you receive the **AnalyzeAVW.dat** license file before commencing installation.

## 2. System Preparation

### Disk Space

Ensure that the system on which you will be installing this software and data has adequate free disk space. The disk space requirements are as follows:

#### System Specific Disk Space Requirements

Manufacturer	Disk Space	Operating System
DEC Alpha	24 Mb	Digital UNIX 4.0+
Hewlett Packard	20 Mb	HP-UX 10.02+
IBM	21 Mb	AIX 4.2+
Silicon Graphics	28 Mb	IRIX 6.5+
Sun Microsystems	19 Mb	Solaris 2.6+
PC (Intel) Linux	15 Mb	Red Hat 6.0+ or compatible

+later operating systems supported if compatible with the OS listed above.

#### Additional Disk Space Requirements

Section	Disk Space	Options
<b>Analyze</b> root	38 Mb	Mandatory
<b>Analyze</b> Tutorial Documents	12 Mb	Optional
<b>Analyze</b> Tutorial Data	129 Mb	Optional
<b>AVW</b> Development Environment	38 Mb	Optional

The disk space requirements and operating system levels for supported platforms are indicated in the above tables. The CD-ROM distribution of **Analyze** contains software for all supported systems, so total disk space requirements for combinations of several components will need to be computed from these tables. The **install** program will compute the total disk requirements and report the total prior to final installation. Be certain that the system on which you will be installing this software and data has adequate free disk space.

The operating system version you are using is normally indicated in the system banner when you log into the system. If you are running an earlier version of the operating system than is indicated for your system type, **Analyze** may not function.

In the system on which **Analyze** is being installed has a resident copy of a previous version of **Analyze**, you may wish to uninstall the previous version (using the **setup** script supplied with the CD for that version) prior to installation of the new **Analyze**. Otherwise, make sure to choose a new installation directory for this version.

## 3. Software Installation

To begin the installation procedure for the *Analyze* package, login as *root* on the system that has the target disk mounted that will store the *Analyze* software. It is assumed that the system has a CD-ROM drive attached to it. For the rest of these instructions, this system will be referred to as *host*.

### Mounting the CD-ROM

The *Analyze* CD-ROM contains two main components: the complete *Analyze* distribution for all supported systems, including ancillary files and image data, in the **BIR** directory, and an interactive installation script called **install** for installation of the *Analyze* software, including support for uninstallation of previously installed software. The CD-ROM contains a mountable file system (hsfs) that is mountable on the workstations supported by *Analyze* (those which support the ISO 9660 format with Rock Ridge extensions). All files on the CD-ROM are uncompressed, including image data, and are organized with a standard UNIX directory/file structure. Each of the different systems provide various mechanisms for mounting the CD-ROM on a directory for that system. Often this mount needs to be done manually, specifying the CD-ROM device and a directory on which to do the mount. Some systems will automatically mount the CD-ROM on a specific directory when the CD-ROM is inserted into the drive, often invoking a file manager window in association with the inserted CD-ROM. Check with your systems administrator or workstation documentation for information on mounting a CD-ROM on your system.

Once mounted, the information on the CD-ROM can be accessed in the directory on which the CD-ROM is mounted. Change to this directory and proceed with the remainder of the installation process.

### Running *install*

The **install** script on the *Analyze* CD-ROM facilitates easy installation of all *Analyze* components. To invoke the setup script, change to the mounted directory for the CD-ROM and in a shell window, execute the following command:

```
❑ ./install
```

The interactive installation script provides all information necessary to install the *Analyze* components. The initial option list is displayed once the script is executed:

```
Welcome to the Analyze 3.1 install script.
```

```
What would you like to do ?
```

```
a - Install Analyze  
u - Uninstall Analyze  
i - Information  
q - quit
```

```
Choice (a, u, i, q) [i] ?
```

For additional information on the installation procedure, select the **'i'** option.

## Analyze Software Installation (option 'a')

To install the **Analyze** software, select the 'a' option. Using this installation process, you will load selected directories and files onto a new directory that will be automatically created for storing the **Analyze** package. For each of the supported system types, you will have a choice to either not install that version or install the version to your disk, with the system type upon which you are running automatically selected for installation:

For each of the following questions, select the installation type:

y = Yes, install this option to disk

n = No, do not install this option to disk

l = Install this option as a link to CDROM (Not available for all options)

NOTE: Normally only one of the following system targets will be specified. The choices will be: DEC Alpha, HP, IBM, SGI, Sun and PC Linux. The system type upon which you are running this installation will default to [y].

The **Analyze** root and each optional system type is then presented for selection of the installation process:

Install:

DEC Alpha Version (y n) [n] ?

HP Version (y n) [n] ?

IBM Version (y n) [n] ?

SGI Version (y n) [y] ?

Sun Version (y n) [n] ?

PC Linux Version (y n) [n] ?

Any combination of full installation and no action can be selected. Following the system types, selection of the **Analyze Tutorials** and tutorial image data is similarly provided:

NOTE: Online tutorials, with step by step instructions, are available for many of the Analyze modules. These tutorials are very useful, but the tutorial data requires considerable disk space (129Mb).

Install Tutorials (y n l) [y]?

Tutorial Data (y n l) [y]?

Next, the ancillary **Analyze** and **AVW** files (Analyze Developers Add-On users only) can be installed:

NOTE: The following option allows development with the AVW programming environment. It has no effect on the ability to run Analyze.

AVW Development Files (man pages, include, examples) (y n l) [n] ?

The next entry specifies the location on the workstation in which a new directory called **BIR** will be created and to which all files will be copied:

Please enter the directory where you wish Analyze to be installed. The install script will automatically append /BIR. [ /home ] ?

The **BIR** directory will be created if it doesn't exist:

The directory /home/BIR does not exist.

Create it (y n) [y] ?

If the directory does exist, you will be asked if you wish to use that specific directory:

```
The directory /home/BIR already exists.  
Use /home/BIR (y n) [n] ?
```

If the directory is write protected, an error will be reported and the prompt for directory entry will be redisplayed. Once the directory has been established, the script will report all components that will be installed and their size:

```
Installation Information  
=====  
CD = /CDROM  
Install Directory = /home/BIR  
  
Install Analyze root  
Install SGI Version  
Install Tutorials  
Install Tutorial Data  
  
Required Space = 227 Mb  
  
Install (y n) [n] ?
```

Selecting '**n**' will cause the script to exit. Selecting '**y**' will proceed with the installation, which may take several minutes depending on the size of the install. As the installation proceeds, messages will be displayed to indicate the current item being processed to show the status of the installation:

```
Installing Analyze root... done.  
Installing SGI... done.  
Installing Tutorials... done.  
Installing Tutorial Data... done.
```

Editing the default path in the Analyze script.

The Analyze Tutorials were distributed in .PDF format. It is assumed That an Acrobat Reader has been previously installed. For more Information, go to: <http://www.acrobat.com>

To complete installation, the Analyze.dat file must be copied from email or entered from fax or hardcopy to the \$BIR/FLEXlm-7.0/licenses directory.

Once the license file exists, the license server must be started using the \$BIR/FLEXlm-7.0/\$TARGET/bin/lmgrd command either at the command prompt or by inclusion in the boot startup script for the system.

To run Analyze:

```
cd /home/BIR/bin  
./Analyze
```

Analyze Installation Complete.

Note that the **Analyze** script in **\$BIR/bin** is altered to reflect the location of **Analyze** on the workstation disk. This path is used to establish the correct **SBIR** environment variable when these scripts are used to invoke **Analyze**. (See the **Analyze** script in **\$BIR/bin** for an example of all environment variable defaults).

Note also that if links are created to the CD-ROM, the CD-ROM must always be present and mounted at the same location for the links to find the proper directories on the CD-ROM.

To complete the installation prior to running **Analyze**, the **Analyze** license manager files must be altered to reflect the proper license information for this system(s), and the FLEXlm license management software must be set up on a server to provide license administration to client workstations, as discussed in the next section on **Analyze License Manager Installation**.

## Analyze Software Uninstall (option 'u')

To remove a previously installed version of **Analyze** (**BIR** directory), select the 'u' option. This will delete the entire **Analyze** software package from your workstation disk.

## 4. License File Installation

**Analyze 3.1** uses the FLEXlm license management software system from GLOBEtrouter Software for system validation and runtime license administration. The FLEXlm license manager software is located in the **SBIR/FLEXlm-7.0** directory. This directory contains a subdirectory called **licenses** within which a default license file is provided, called **AnalyzeAVW.dat**.

The default **AnalyzeAVW.dat** license file MUST BE REPLACED by an **AnalyzeAVW.dat** file specific to your system, otherwise **Analyze 3.1** will not open!

The **AnalyzeAVW.dat** license file specific to your system will be provided to you via email (as described in section 1. "Obtaining a license file"). With **Analyze 3.1**, two types of licenses are available: node locked licenses that allow **Analyze** to be accessed on one specific single system, and floating licenses that allow **Analyze** access to number of systems in a client/server environment. The **AnalyzeAVW.dat** license file has the following format:

```
SERVER servername 12345678
VENDOR mayd

PACKAGE AnalyzeAVW_and_AVW mayd 3.1 98F490FE8E22 \
COMPONENTS="AnalyzeAVW AVW"

INCREMENT AnalyzeAVW_and_AVW mayd 3.1 31-dec-2001 1 000000000000 \
HOSTID=12345678 vendor_info=hostname ISSUER=Mayo
INCREMENT AnalyzeMain mayd 3.1 31-dec-2001 1 000000000000 \
HOSTID=12345678 vendor_info=hostname ISSUER=Mayo
```

A description of the contents of this file follows:

```
SERVER servername 12345678
VENDOR mayd
```

The first two lines specify the **FLEXlm** server information. The system established as the **FLEXlm** server will provide license administration to the specific set of clients listed later in the file. In a single workstation configuration (i.e. a node-locked license), this server will most likely be the same as the client, i.e., servername and server id (12345678) would be the same as the client hostname and client id (12345678). In a multiple workstation, networked environment a single system can act as the **FLEXlm** server with multiple clients receiving license administration from that server (i.e. a floating license). This server may most likely be one of the **Analyze** clients, but the **FLEXlm** server could also be a non-**Analyze** validated system, such as a specific system that currently does **FLEXlm** license management for other software packages. In any of these cases, the server information on the first line in the file must be the proper servername and the proper server id (12345678). The second line specifies the name of the daemon process that runs on the server to provide license service to the clients. The daemon process for **Analyze** license administration is called **mayd**, and the executable files for this daemon process are located in the **SBIR/FLEXlm-7.0** directory in system-specific directories for the type of server system (i.e., ALPHA/bin, HP/bin, SGI/bin, SUN/bin).

The next group of information includes information about the licensed software:

```
PACKAGE AnalyzeAVW_and_AVW mayd 3.1 98F490FE8E22 \  
COMPONENTS="AnalyzeAVW AVW"
```

The final four lines specify an individual client **Analyze** license:

```
INCREMENT AnalyzeAVW_and_AVW mayd 3.1 31-dec-2001 1 000000000000 \  
HOSTID=12345678 vendor_info=hostname ISSUER=Mayo  
INCREMENT AnalyzeMain mayd 3.1 31-dec-2001 1 000000000000 \  
HOSTID=12345678 vendor_info=hostname ISSUER=Mayo
```

In this case, the client system is called hostname and has a system id of 12345678. The license is for a complete copy of **Analyze** that will permit 1 simultaneous copy to run on the client system until the expiration date of 31-dec-2001. The field for the encrypted validation code is currently empty (0000000000000000). Again, from the provided license information, the expiration date (31-dec-2001), number of simultaneous users (1), validation code (0000000000000000), system id (12345678), and system name (hostname) fields must be correct. If not, the license code will not work and **Analyze** will not run. These four lines will be replicated in this same file for all clients supported by this license server. (Note: The \ at the end of each line is a line continuation character. These four lines are actually two long lines of information).

Note that this file must exist and contain the exact information provided on both the server system and all client systems, as this information is important to the communication between the client(s) and the server during license administration. The file should not contain any other information, i.e. client information for other **Analyze** systems served by other **FLEXlm** servers.

Once this file has been established with correct information on the server and all client systems, the server can be started and **Analyze** can be run on the client systems.

## Starting the Analyze / FLEXlm License Server

As mentioned previously, the **FLEXlm** license manager requires a daemon process to be running on a specific **FLEXlm** server to provide license service to the clients. To invoke the license server

process, a special command must be used, called **lmgrd**, which is located in the **\$BIR/FLEXlm-7.0** directory under each system-specific subdirectory. The following command line can be used to start the license server daemon on the server system:

```
❑ $BIR/FLEXlm-7.0/$TARGET/bin/lmgrd -c $BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat
```

where **\$BIR** is the path to the installed software and **\$TARGET** is the proper system type (ALPHA, HP, IBM, SGI, SUN, PC\_LINUX). The **-c** flag specifies the full path to the location of the specific **AnalyzeAVW.dat** file to be used for this license server process. The license server **lmgrd** and daemon process **mayd** will start running and will output information on the status of the license server to the shell window from which the command was issued. An alternative command to start the server daemon and route the output to a log file for server information is:

```
❑ $BIR/FLEXlm-7.0/$TARGET/bin/lmgrd -c $BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat > $BIR/FLEXlm-7.0/Log
```

Once the server process is running on the license server, the clients authorized to obtain licenses from the server may be used to run the **Analyze** software.

Other commands exist in the **\$BIR/FLEXlm-7.0** system-specific bin directories to manage the **FLEXlm** license daemon on the server. All commands reference the specific license server and daemon by specification of the full path to the license file using the **-c** option. The **lmdown** command will shut down the specific license server. The **lmstat** command will provide useful information about the current status of the license server. The **lmdiag** command will provide additional diagnostics output to the Log or the shell window during the license server execution. The server process can also be added to the system startup files and the license server invoked automatically upon system initialization. Examples for various systems startup procedures are provided in **\$BIR/FLEXlm-7.0/flexlmstartup**. For additional information on these commands and other **FLEXlm** license server specifics, see the **FLEXlm End User Manual** located in the **\$BIR/FLEXlm-7.0/htmlman/flexuser** directory (HTML files) or refer to GLOBEtrotter Software's web page at <http://www.globetrotter.com>.

## The Analyze / FLEXlm Client

The client systems which are authorized to run the **Analyze** software must be set up to make requests to the proper **FLEXlm** server. As previously mentioned, the **\$BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat** file on the client side must be exactly the same as that on the server for working communication to the license manager. The **Analyze** software will automatically look for the license file at **\$BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat** in order to make the proper requests to the server (all communication is referenced to the license file). If this license file is at a different location or has a different file name, the **LM\_LICENSE\_FILE** environment variable will need to be set to look for this alternative license file (complete path specification to the file). Consult the **FLEXlm End User Manual** in the **\$BIR/FLEXlm-7.0/htmlman/flexuser** directory (HTML files) or refer to GLOBEtrotter Software's web page at <http://www.globetrotter.com> for additional information on the client license access.

## 5. Running Analyze 3.1

If you have completed the installation process and followed the instructions for setting up the various **Analyze 3.1** facilities, including the license installation, you are now ready to run the **Analyze 3.1** program (and may do so with the provided demonstration data)

### Running The Analyze 3.1 Program

To run the **Analyze** software system, change to the **\$BIR/bin** directory and execute the **Analyze** startup script:

```
 cd /home/BIR/bin
 ./Analyze
```

The first part of this **Analyze** script establishes several environment variables that are needed to specify the location of the **Analyze** software and other ancillary files:

```
if ($?BIR == 0) setenv BIR /home/BIR
setenv AVW_VERSION 3.1
setenv AVW $BIR/AVW-$AVW_VERSION
setenv AAWW $BIR/Analyze-$AVW_VERSION
setenv TCL_ROOT $BIR/TCL-TK8.3
setenv TCL_LIBRARY $TCL_ROOT/lib/tcl8.3
setenv TK_LIBRARY $TCL_ROOT/lib/tk8.3
```

The **BIR** environment variable needs to be set to the proper location of the **Analyze** software package. This will have been changed by the **setup** script to the proper path during installation. Setting this environment variable to the proper path may also be done in other scripts, like **.cshrc**, with the path to **\$BIR/bin** added as part of the **PATH** variable. If **BIR** has been set to the proper path, the **Analyze** software system can be invoked by simply typing **\$BIR/bin/Analyze** or **Analyze**.

### Drag and Drop in Analyze

Drag and drop for volume images in **Analyze** requires secure X-windows authorization in the X-windows server. This is the case for most systems, but on SGI systems, configuration files for the X-windows system need to be changed in order to enable secure authorization. To enable a secure X-server on SGI systems, the **/var/X11/xdm/xdm-config** file must be edited and the **"DisplayManager\*authorize:"** entry changed to **"on"**.

### Analyze Basics

To quickly learn the basics of Analyze, we recommend that you work through the Analyze tutorials (shown under Help > Tutorials). The tutorials are in .pdf format and require Adobe Acrobat to read. For optimal tutorial viewing and printing quality, we recommend downloading the latest version of Acrobat from Adobe's website at [www.adobe.com/acrobat](http://www.adobe.com/acrobat).

The Analyze Users Guide is shown in html format under the Help > User Guide menu and requires a configured web browser to read. The "Special Section on Image I/O" contains a useful

troubleshooting guide on loading image files into Analyze. Read in conjunction with the "Import and Export of Image Data" tutorial, these two resources provide answers to the most commonly asked Image loading questions.

Another good starting point is the Analyze Users Manual, which contains step by step instructions on how to use each Analyze module. This is not included on the AnalyzeCD, but the latest version of this can be downloaded in PDF format from our website at [www.analyzedirect.com/support/usersmanual](http://www.analyzedirect.com/support/usersmanual).

Of special note - **Analyze 3.1** does not automatically load all of the image file format support libraries that are possible with Analyze. This keeps module startup time to a minimum, loading only those image formats that you need to use with Analyze for your purposes. To configure your version of Analyze to load additional image file formats, use the Import/Export External Libraries tool. Consult the documentation mentioned above for more information if you encounter difficulties in importing or loading your image file format.

## 6. What to do when your license file expires

All Analyze license files have a built-in expiration date. For Analyze evaluators, this date is usually around 30 days after the license file was first sent. If you are an evaluator and you still wish to use Analyze following the expiration of your license file, please contact us at [validate@analyzedirect.com](mailto:validate@analyzedirect.com) to find out about purchasing options.

For Analyze customers, long-term Analyze license files are provided in 12-month increments. AnalyzeDirect contacts all customers and evaluators within the month prior to the expiration of the license file in advance of the expiration date to determine if the license file system information is still current. Once we receive system confirmation, a new license file will be sent by e-mail. If your licence file expires, and you have not yet received a new license file, please contact us at [validate@analyzedirect.com](mailto:validate@analyzedirect.com) to obtain your renewal license file.

### Installing a renewal license file

To install a renewal license file, do the following:

1. Shut down the existing license manager process by using the **lmdown** command on the server:

```
❑ $BIR/FLEXIm-7.0/$TARGET/bin/lmdown -c $BIR/FLEXIm-7.0/licenses/AnalyzeAVW.dat
```

where **\$BIR** is the path to the installed software and **\$TARGET** is the proper system type (ALPHA, HP, IBM, SGI, SUN, PC\_LINUX). The **-c** flag specifies the full path to the location of the specific **AnalyzeAVW.dat** file to be used for this license server process.

2. Replace the existing AnalyzeAVW.dat license file (in the \$BIR/FLEXIm-7.0/licenses directory) with the renewal AnalyzeAVW.dat license file.
3. Restart the licence manager process using the **lmgrd** command:

❑ \$BIR/FLEXIm-7.0/\$TARGET/bin/lmgrd -c \$BIR/FLEXIm-7.0/licenses/AnalyzeAVW.dat

where **\$BIR** is the path to the installed software and **\$TARGET** is the proper system type (ALPHA, HP, IBM, SGI, SUN, PC\_LINUX). The **-c** flag specifies the full path to the location of the specific **AnalyzeAVW.dat** file to be used for this license server process.

4. Replace the AnalyzeAVW.dat license file on any client systems (again, located in the \$BIR/FLEXIm-7.0/licenses directory) with the renewal license file
5. Analyze should now be ready to use.

## 7. Analyze Developers Add-On Notes

The Analyze developers add-on allows software developers to extend the capabilities of Analyze by developing their own macros and modules, using the AVW (A Visualization Workshop) image function library on which Analyze is built, and Tcl/Tk, the interface language used by Analyze. To get access to development capabilities, select “Custom” installation as the installation type, and check the “Development Files” box (See Analyze 3.1 setup notes above). The Developers Add-On also requires an AnalyzeAVW.dat license file that allows access to these development capabilities. By default, the license file ordering process outlined in section 1, Obtaining a License File, sends a license file that does not give development access – please indicate that you need a Developers Add-On license file when you send your e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com).

The Developers Add-On assumes you're familiar with programming in the C and Tcl programming environment. If you want to know more about Tcl programming we recommend starting with the 'Bible' of Tcl/Tk - "Practical Programming in Tcl and Tk" by Brent Welch. This comes with a CD that you can load on to your computer which includes a full Tcl/Tk implementation and many examples.

The AVW Programmers Guide and AVW Reference Manual can be found in the \$BIR/AVW-3.1/Manuals directory, or can be downloaded in PDF format from our website at [www.analyzedirect.com/support/downloads](http://www.analyzedirect.com/support/downloads).

The best place to start practicing AVW-based Tcl/Tk is in the examples provided in the \$BIR/AVW-3.1/extras directory. Here you will find a number of example source files, both in C and in Tcl/Tk, for common Analyze imaging tasks (like rendering, segmentation, etc.). The .tcl scripts contained in these subdirectories are full source code scripts which are able to be run, but you do need the Tcl/Tk environment set up such that these scripts can find the Tcl/Tk files needed to execute. There are .bat scripts included in the /BIR/bin directory which will invoke **tclsh** and/or **wish** with a given script file and will set all of the necessary environment variables to make this work. You should use these as examples to make sure everything is set up before running any of the Tcl/Tk scripts.

## 8. Support

For support related issues, please send an e-mail to the AnalyzeDirect support team at support@analyzedirect.com. Maintenance agreements which include access to support and upgrades can be purchased directly from the AnalyzeDirect website at www.analyzedirect.com.

## 9. Installed Software Organization (Unix and Linux)

When **Analyze 3.1** has been installed on your Unix or Linux system, the software organization in the installation directory (named BIR by default) will contain the following subdirectories and files (dependent on type of installation):

- **AVW-3.1**: the *AVW* libraries and development environment.
  - **ALPHA**: shared libraries for DEC Alpha systems.
  - **COPYRIGHT**: copyright notice information for the *AVW* libraries.
  - **HP**: *AVW* shared libraries for Hewlett Packard systems.
  - **IBM**: *AVW* shared libraries for IBM systems.
  - **LicenseAgreement**: license agreement notice for the *AVW* libraries.
  - **Manuals**: PDF copies of the *AVW* Programmers Guide and *AVW* Reference Manual
  - **PC\_LINUX**: *AVW* shared libraries for Intel-based PC's running the Linux OS.
  - **SGI**: *AVW* shared libraries for Silicon Graphics systems.
  - **SUN**: *AVW* shared libraries for Sun Microsystems systems.
  - **app-defaults**: default settings for *AVW* functions.
  - **develop\_env**: initialization script to support *AVW*-based software development.
  - **extras**: example programs to support *AVW*-based software development.
  - **include**: include files (.h) for *AVW*-based software development.
  - **man**: manual pages in standard 'man' format and html format for all *AVW* library functions.
- **Analyze 3.1**: the *Analyze* programs, tutorials, help documents and ancillary files.
  - **AnalyzeTutorials**: *Analyze* Tutorial documentation in PDF format.
  - **BitMaps**: bitmap files used for *Analyze* icons.
  - **COPYRIGHT**: copyright notice information for the *Analyze* software system.
  - **HelpDocs**: HTML-based on-line help documentation for *Analyze*
  - **LicenseAgreement**: license agreement notice for the *Analyze* software system.
  - **app-defaults**: default settings for individual *Analyze* programs.
  - **bin**: the executable *Analyze* programs.
  - **lib**: functions for specific routines and widgets which support *Analyze*
- **FLEXlm-7.0**: the FLEXlm license manager files for **Analyze** system license administration.
- **PublishSpool**: files to support the *Analyze* printing mechanism.
- **SPM99-AAVW**: files to link *Analyze* and SPM99 to allow direct image file sharing.
- **TCL-TK8.3**: interpreted language upon which *Analyze* is built (public domain).
- **bin**: executable scripts for starting *Analyze*
- **ghost4.03**: an implementation of ghostscript used for printing support (public domain).
- **images**: *Analyze* Tutorial image data and *AVW* 'extras' image data.

## 10. Analyze Image Memory Management

The **Analyze** software system uses a method of memory management for loaded volume images that directly memory maps to a new file which is created for each volume image when it is loaded. These memory mapped copies of the original volume image file have a .mmap extension and are located in a specific directory that can be controlled by the user. By default, this directory is set to the system tmp directory ( /tmp, ), as it always exists, usually has sufficient space for a few loaded images, is often integrated with the system swap space, and is cleaned of existing files during a reboot. However, depending on the system configuration of the disks, it may be desirable to change the location for these memory mapped files based on the available disk resources. The **ANA\_DIR** environment variable permits specification of this directory to hold the memory mapped files. For example, to change the location from the default to a directory on a disk with more available space (site specific):

```
❑ setenv ANA_DIR /usr/home/images
```

The location of this directory should be on a disk local to the system running **Analyze**.

The memory mapped files directory (also referred to as the 'workspace' directory), can also be changed while running **Analyze**. With the cursor over the main **Analyze** program canvas, select and hold the right mouse button, which will bring up a menu of several selections. The 'Workspace Directory' selection permits the entry of a new directory for the memory mapped files. This directory should be local to the system and should be on a disk partition with sufficient free disk space to handle the volume of loaded image data expected for all users.