

FullVideo Supreme and FullVideo Supreme JPEG

Owner's Guide

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Preface

Guide Overview

- Purpose** This guide describes the FullVideo Supreme and FullVideo Supreme JPEG modules for Alpha PCI-based systems. This guide explains how to connect cables between a module and common peripherals, and it includes an overview of hardware, software, and standards.
- Audience** This guide is for individuals who install and use the FullVideo Supreme and FullVideo Supreme JPEG modules.
- Contents** This guide lists the features of the FullVideo Supreme and FullVideo Supreme JPEG modules. Generic instructions for installing an option module in your workstation are available in your system documentation - not in this guide.
- The guide is organized as follows:
- **Chapter 1** describes the FullVideo Supreme and FullVideo Supreme JPEG modules. It also provides an overview of the Multimedia Services for Digital UNIX software, Multimedia Services for OpenVMS Alpha software, and Digital Light & Sound Pack V1.0 for Windows NT software with which you can develop multimedia applications. Chapter 1 lists peripherals you can use with the modules.
 - **Chapter 2** provides installation instructions, such as how to add cables to the option module, to the FullVideo Supreme and FullVideo Supreme JPEG modules.
 - **Appendix A** lists information for Digital services personnel.

- **Appendix B** lists hardware specifications.
- A **Glossary** defines frequently used multimedia terms.
- An **Index** provides references to information in this guide.

Conventions

The following conventions are used in this guide:

Note	Notes provide general information about the current topic.
<code>show</code> <code>config</code>	A word in this typeface indicates a command that you must enter from the keyboard at the console prompt (>>>).
❶	A number in a circle corresponds to a number in an illustration.
<code>Return</code>	A key name shown enclosed indicates that you press that key on the keyboard.

Multimedia

Overview

This chapter provides information about the following:

- FullVideo Supreme and FullVideo Supreme JPEG modules
- Multimedia Services for Digital UNIX software
- Multimedia Services for OpenVMS Alpha software
- Digital Light & Sound Pack V1.0 for Windows NT software

Multimedia Technology

Multimedia is a technology with which you can capture, alter, and present information such as audio, video, graphics, and text. The FullVideo Supreme and FullVideo Supreme JPEG modules offer the technical advantage of video capture and live playback at the desktop; information can be captured in real-time, stored locally, and then transmitted over the network to a distant multimedia system. Users of the Digital Alpha workstation's fast PCI bus can add the FullVideo Supreme and FullVideo Supreme JPEG hardware and multimedia software development tools to a computing environment that already provides:

- Desktop computing
- Industry-standard personal productivity tools
- Access to distributed applications and resources

FullVideo Supreme and FullVideo Supreme JPEG Modules

Overview

The FullVideo Supreme and FullVideo Supreme JPEG modules permit you to add multimedia capabilities to your Alpha workstation by simply installing one module in an available PCI bus slot. There is no need to remove or change a color frame buffer module or a graphics module that may already be in place.

The FullVideo Supreme and FullVideo Supreme JPEG modules allow you to receive and transmit video by using television, video cassette recorders, video cameras, and so on.

Features

The FullVideo Supreme module (AV301-AA) and the FullVideo Supreme JPEG (AV321-AA) module have the following features:

- Real-time video capture of video signals in:
 - National Television System Committee (NTSC) (640 x 480 pixels) format.
 - Phase Alternation Line (PAL), or *Systeme Electronique Couleur Avec Memoire* (SECAM), (768 x 576 pixels) formats.
- Real-time video input in NTSC or PAL, or SECAM, in composite and S-video format.
- NTSC and PAL video output, in either composite or S-video format.
- NTSC full-frame video data capture; PAL and SECAM full field capture.
- The FullVideo Supreme JPEG module (AV321-AA) features real-time Joint Photographic Experts Group (JPEG) compression/decompression of the video signal.
- AccuVideo rendering in hardware to ensure superior perceptual image quality, and a choice of output colors, brightness, contrast, saturation, and image sharpening.
- Video scaling of window size from icon to full-screen size. Video windows can be sized dynamically.

FullVideo Supreme and FullVideo Supreme JPEG Modules

- Scaling and filtering of video signal before compression.
- Dithering from 24 bits/pixel to 2 to 256 colors.
- Scaling and filtering of the video stream prior to dithering, independent of precompression scaling.
- Genlock to external devices.
- Graphics overlays.
- Video capture (video-in) in 4:2:2 YUV format, in 8-bit pseudo-color, in 8-bit grayscale, or in 24-bit true color (conversion done in software).

Note

The FullVideo Supreme module does not contain Joint Photographic Experts Group (JPEG) compression /decompression, nor does it support direct RGB input.

The two option modules are summarized in Table 1.

Table 1 Modules

Module Part No.	Description
AV321-AA	FullVideo Supreme with JPEG compression /decompression
AV301-AA	FullVideo Supreme without JPEG compression /decompression

Configuring Multimedia Systems

You can install one or two option modules on any base system that has one or more available slots, and supports the Alpha PCI architecture. Two modules on one system supplies two simultaneous video inputs or supplies one active video input and one active video output.

FullVideo Supreme and FullVideo Supreme JPEG Modules

Software Requirements

If you purchase a new AlphaStation system, you automatically receive the Multimedia Services software included in your operating system software. You need the following versions of software with a multimedia system:

- For Digital UNIX systems:
 - Digital UNIX (formerly called DEC OSF/1) Version 3.2
 - Multimedia Services for Digital UNIX runtime subset, Version 1.6
- For OpenVMS Alpha systems:
 - OpenVMS Alpha Version 6.1
 - Multimedia Services for OpenVMS Alpha runtime subset, Version 1.4
- For Windows NT systems:
 - Microsoft Windows NT Version 3.51
 - Digital Light & Sound Pack V1.0 for Windows NT

To add a FullVideo Supreme (AV301-AA) or a FullVideo Supreme JPEG (AV321-AA) module to an existing AlphaStation system, you must purchase one of following:

- Digital Light & Sound Pack V1.0 for Windows NT (QB-4LTAA-SA)
- Multimedia Services for Digital UNIX runtime subset, Version 1.6 (QL-20YA9-AA)
- Multimedia Services for OpenVMS Alpha runtime subset, Version 1.4 (QL-4G9A9-AA)

Peripherals

You can add any of the following devices to your AlphaStation:

- RRD4x compact disc drives (for software installation)
- Laser disc player
- Switcher
- VCR
- Video camera

Multimedia Enabling Software

Overview

Multimedia Services for Digital UNIX, Multimedia Services for OpenVMS Alpha and the Digital Light & Sound Pack V1.0 for Windows NT, are the multimedia video enabling software for Digital Alpha workstations. The software helps developers create multimedia end-user applications and enhance existing applications using the FullVideo Supreme and FullVideo Supreme JPEG modules.

Multimedia Services Software Subsets

Both the Multimedia Services for Digital UNIX software and Multimedia Services for OpenVMS Alpha software contain a runtime subset and a developer's subset as follows:

- The runtime subset provides the runtime multimedia software that enables audio on Alpha workstations, provides a multimedia server, audio and video drivers, audio and video record and playback utilities, the DECsound utility, the Video Odyssey screen saver, as well as audio and video clips.
- The developer's subset includes the contents of the runtime subset, support for waveform audio recording and playback, support for video capture and playback, support for video compression and decompression to manage data stored in WAVE and AVI files, sample applications, and a programmer's manual. A larger selection of audio and video clips is available to developers as part of this kit.

Digital Light & Sound Pack V1.0 for Windows NT Software Subsets

The Digital Light & Sound Pack V1.0 for Windows NT software, created specifically to enhance Microsoft's Video for Windows™, includes the necessary drivers for the FullVideo Supreme and FullVideo Supreme JPEG products, and Alpha optimized software coders.

Microsoft Video for Windows is the multimedia enabling software environment included with your Windows NT operating system software. Video for Windows helps users create multimedia applications and enhance existing applications using the FullVideo Supreme JPEG module.

Multimedia Enabling Software

Multimedia Services for Digital UNIX Documentation

Your **Multimedia Services for Digital UNIX** software is shipped with the following documentation. When you order additional documents, please request the latest revision of the document.

- *Multimedia Services for Digital UNIX Installation Guide*, order number AA-Q66GF-TE
- *Multimedia Services for Digital UNIX Programmer's Guide*, order number AA-Q0APG-TE
- *Multimedia Services for Digital UNIX Run-Time Environment Guide*, order number AA-Q66FF-TE

Multimedia Services for OpenVMS Documentation

Your **Multimedia Services for OpenVMS Alpha** software is shipped with the following documentation. When you order additional documents, please request the latest revision of the document.

- *Multimedia Services for OpenVMS Alpha Installation and User's Guide*, order number AA-QN8KA-TE
- *Multimedia Services for OpenVMS Alpha Programmer's Guide*, order number AA-QN8HA-TE
- *Multimedia Services for OpenVMS Alpha Run-Time Environment Guide*, order number AA-QN8JA-TE

Digital Light & Sound Pack V1.0 for Windows NT Documentation

Your **Digital Light & Sound Pack V1.0 for Windows NT** software is shipped with the following documentation. When you order additional documents, please request the latest revision of the document.

- *Digital Light & Sound Pack Version 1.0 for Windows NT Installation and User's Guide*, order number AA-QNFFA-TE

2

Option Installation

Overview

This chapter explains how to install the FullVideo Supreme and FullVideo Supreme JPEG modules:

- Unpack the parts kit
- Install the option module
- Connect cables to the module
- Verify the installation
- Solve problems

Each of the modules occupies one PCI bus option slot, and each module provides connections for video-in and video-out devices.

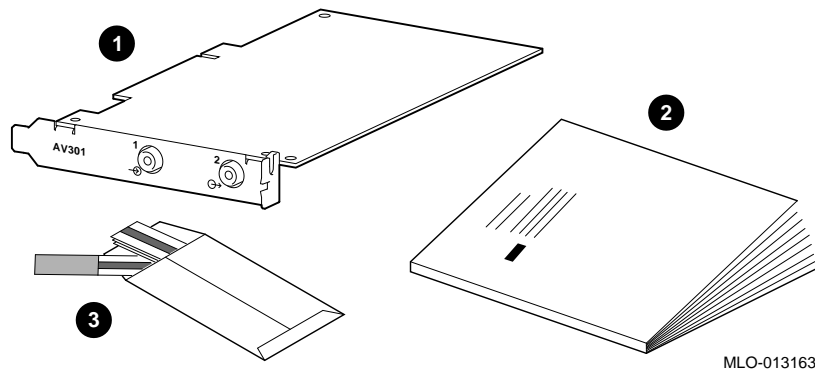
Unpacking the Parts Kit

Contents of the FullVideo Supreme Kit

The FullVideo Supreme parts kit (see Figure 1) contains the following items:

- ❶ FullVideo Supreme module
- ❷ This document
- ❸ Disposable antistatic wrist strap

Figure 1 Contents of FullVideo Supreme Kit



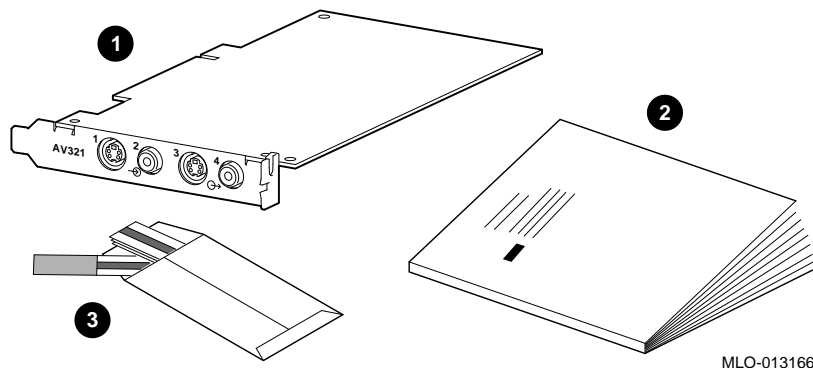
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Contents of the FullVideo Supreme JPEG Kit

The FullVideo Supreme JPEG parts kit (see Figure 2) contains the following items:

- ❶ FullVideo Supreme JPEG module
- ❷ This document
- ❸ Disposable antistatic wrist strap

Figure 2 Contents of FullVideo Supreme JPEG Kit



Cabling Hints

Multimedia applications can use numerous peripheral devices plus system and option modules. Each device has its own cabling requirements. Label each cable in your multimedia configuration to make moving or changing equipment easier.

The use of professional-quality S-video cables is not required by this product to ensure customer satisfaction with the video output. However, two versions of the Radio Shack S-video cable have been found to work well with the FullVideo Supreme and FullVideo Supreme JPEG hardware:

- Part number 15-1510 (6 feet in length)
- Part number 15-1503 (12 feet in length)

S-video quality may vary from cable vendor to cable vendor.

Installing the Option Module

Overview

FullVideo Supreme and FullVideo Supreme JPEG modules can be installed in any available PCI bus slot in your system. Option modules are installed in PCI bus slots in a similar way. Refer to your system documentation for the following information:

- Shut down the system software.
- Turn off the system.
- Remove system cables.
- Remove any system unit cover.
- Attach an antistatic wrist strap.
- Install an option module.
- Replace the system unit cover.
- Connect the system cables.
- Turn on the system.
- Reboot the system software.

Installation Hints

After you complete the hardware installation, proceed as follows:

- At the console, type `show config` and press the `[Return]` key. If the hardware installation is successful, the screen displays `Digital FullVideo Supreme JPEG for the AV321-AA module,` and `Digital FullVideo Supreme for the AV301-AA module.`
- Use the multimedia software documentation that came with your system, when you install multimedia software.
- If the multimedia software and drivers are not loaded, the operating system does not recognize the AV301 or AV321 option during a first boot.
- During an operating system reboot with the multimedia software and drivers installed, the module is recognized as `jv0` at `pci0`, for example.

Installing the Option Module

- For a Digital UNIX installation, load the PAK first, then load your multimedia software. A new kernel is created. Copy the new kernel to the current one. Reboot the system using the command `shutdown -r now` and press the key.
- Remember, the minimum memory configuration for each operating system and platform is different. Refer to your Software Product Description (SPD) for additional information.
- The FullVideo Supreme and FullVideo Supreme JPEG modules are unique in that they work with any frame buffer. Most applications, including diagnostics, are biased toward the display of video on 8-plane frame buffers. If you have a 24-plane frame buffer, refer to your software documentation to insure that the color maps, default visual data types, and so on, are properly set.

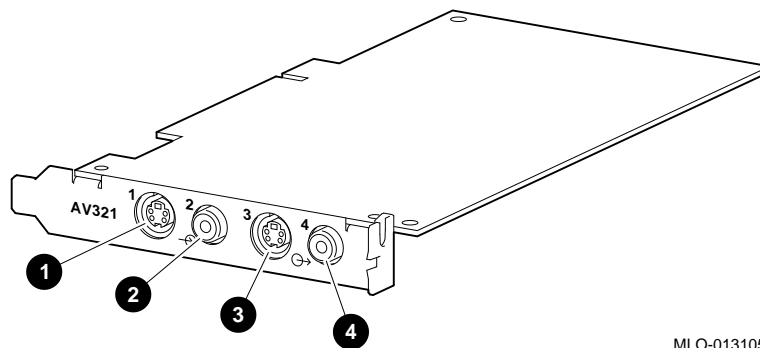
Connecting Cables to the Module

AV321-AA Bulkhead Connectors

The FullVideo Supreme JPEG module (AV321-AA) has four bulkhead connectors as shown in Figure 3:

- ❶ Video In S-video — 4-pin mini-DIN S-video connector
- ❷ Video In Composite — RCA-type connector
- ❸ Video Out S-video — 4-pin mini-DIN S-video connector
- ❹ Video Out Composite — RCA-type connector

Figure 3 FullVideo Supreme JPEG Bulkhead Connectors



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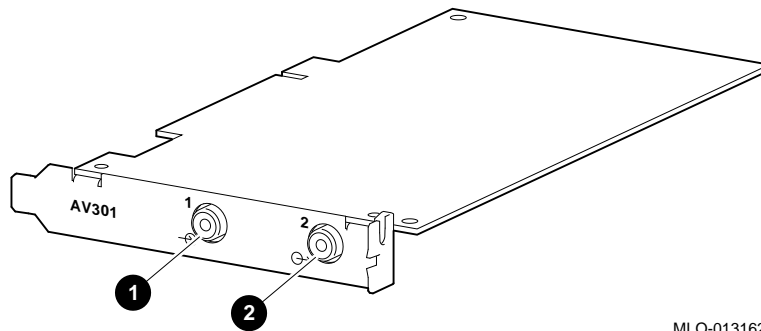
Connecting Cables to the Module

AV301-AA Bulkhead Connectors

The FullVideo Supreme module (AV301-AA) has two RCA-type composite video connectors as shown in Figure 4:

- ❶ Video In Composite — RCA-type connector
- ❷ Video Out Composite — RCA-type connector

Figure 4 FullVideo Supreme Bulkhead Connectors



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Connecting Cables to the Module

Video Display Devices

Table 2 identifies the cables you use to connect a FullVideo Supreme module to a video display, TV, camera, camcorder, or VCR input connector.

Table 2 Using Cables Correctly with Video Input Devices

If the video display has...	Follow these instructions...
An RCA connector	Connect an RCA-to-RCA cable (customer supplied) to ④ in Figure 3 and ② in Figure 4.
An S-video 4-pin mini-DIN connector	Connect an S-video to S-video cable (customer supplied) to ⑤ in Figure 3.

Video Sources

Table 3 identifies the cable you use to connect a FullVideo Supreme JPEG module to a laser disc player, TV tuner, camera or VCR output connector.

Table 3 Using Cables Correctly with Video Output Devices

If the video disc player has...	Follow these instructions...
An RCA connector	Connect an RCA-to-RCA cable (customer supplied) to ② in Figure 3 and ① in Figure 4.
An S-video 4-pin mini-DIN connector	Connect an S-video to S-video cable (customer supplied) to ① in Figure 3.

Note

End-user applications that require the play of video in a window without computer-driven device control can use any video source. Application writers can write device control programs for any video device.

Verifying the Installation

Overview

When you install the Digital UNIX or OpenVMS Alpha multimedia enabling software on your system, an installation verification procedure (IVP) automatically tests the hardware to ensure that the FullVideo Supreme or FullVideo Supreme JPEG module has been properly installed.

Operating System-Based Diagnostics

Operating system-based diagnostics run during the Multimedia Services for Digital UNIX IVP, or the Multimedia Services for OpenVMS Alpha IVP. The diagnostics use the FullVideo Supreme and FullVideo Supreme JPEG drivers and enabling software, to test complex functions such as compression, decompression, and dithering.

See your Multimedia Services for Digital UNIX documentation and Multimedia Services for OpenVMS Alpha documentation for additional information.

Additionally, you can use the procedures recommended in the DECVET Version 3.3 product for installation verification.

Problem Solving Hints

PCI Bus Problems

Problems with the option module can be related to network options, or PCI-based options. Your system documentation provides you with information to diagnose the likely cause of PCI bus problems. Follow these steps to troubleshoot a problem:

Step	Action
1	Confirm that the FullVideo Supreme or FullVideo Supreme JPEG modules and any cables are properly seated.
2	Check for a faulty slot by moving the installed module to an open slot.
3	Call your Digital service representative for help.

Service Contract and Warranty

If the Installation Verification Procedure (IVP) detects an error and if you have a service contract or your warranty is in effect, report the problem to your Digital Customer Support Center, CSC.

A

For Digital Services Representatives

Overview This appendix provides a list of field replaceable units (FRUs).

Ordering FRUs Table 4 lists the field replaceable units that a Digital Service Representative can order.

Table 4 Field Replaceable Units

Field Replaceable Unit	Part Number
FullVideo Supreme JPEG module (AV321-AA)	54-23296-03
FullVideo Supreme module (AV301-AA)	54-23296-04
Antistatic wrist strap	12-36175-01

B

Hardware Specifications

Overview

This appendix provides the following hardware specifications for the FullVideo Supreme and FullVideo Supreme JPEG modules:

- Mechanical size
- Environmental specifications
- Video input/output electrical characteristics

Mechanical Size

The FullVideo Supreme and FullVideo Supreme JPEG modules conform to the mechanical dimensions for a short-length PCI option: 4.2 in. x 6.875 in.

Environmental Specifications

Operating Conditions

Table 5 lists the environmental conditions in which the FullVideo Supreme and FullVideo Supreme JPEG modules can operate. *Operating conditions* refers to the environment in which a module is plugged in, turned on, and running in an Alpha system.

Table 5 Operating Conditions

Temperature range	10°C (50°F) to 40°C (104°F) ¹
Relative humidity	10% to 90% (20% to 80% with removable media options)

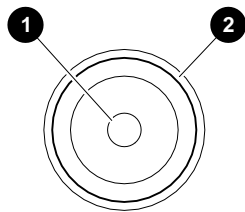
¹Temperature range varies between systems. See your system documentation for additional information.

Video Input/Output Electrical Characteristics

RCA-Type Composite Connector Characteristics

The FullVideo Supreme and FullVideo Supreme JPEG modules have two RCA-type input and output composite connectors. Figure 5 shows a sample connector pin diagram.

Figure 5 RCA-Type Composite Connector Pin Diagram



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Table 6 lists the pin characteristics for both video input and output composite connectors.

Table 6 RCA-Type Composite Connector Pin Assignments

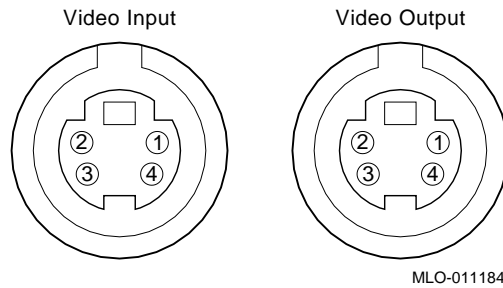
①	Center pin	Composite
②	Outer rim	GND

Video Input/Output Electrical Characteristics

S-Video Input/Output Connector Characteristics

The FullVideo Supreme JPEG module has two S-video input/output 4-pin DIN connectors. Figure 6 shows the connector pin placement.

Figure 6 S-Video I/O Connector Pin Diagram



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The input and output connectors can be software-configured in either S-video or composite mode. Table 7 identifies the electrical characteristics of each pin shown in Figure 6.

Table 7 S-Video I/O Connector Pin Assignments

1	GND
2	GND
3	Luminance
4	Chrominance

Video Input/Output Electrical Characteristics

Video Input Characteristics

Video input signals conform to either NTSC, PAL, or SECAM specifications for timing and levels. Table 8 lists the video input connector characteristics.

Table 8 Video Input Characteristics

Impedance	75 ohms
Input voltage	1 Vpp (nominal)
Polarity	White positive
Coupling	DC coupled

Video Output Characteristics

Table 9 lists the video output connector characteristics.

Table 9 Video Output Characteristics

Impedance	75 ohms
Output voltage	1 Vpp (nominal) into 75 ohms
Polarity	White positive
Coupling	DC coupled

Glossary

This glossary contains concepts, terms, acronyms, and services associated with multimedia.

Application Specific Integrated Circuit (ASIC)

A Digital engineering custom-designed chip, that is manufactured by a semiconductor vendor.

brightness

The amount of white (as compared to the amount of red, green, and blue) in a color. On a monitor, this translates into the amount of pure light in a color. For light sources and signals that transmit color, the brightness component is also called *luminance*.

chrominance

The color component of a composite signal. Chrominance also refers to the color component of any image, as opposed to its grayscale value or luminance.

composite video signal

Composite video signal types combine the YUV and sync signal on one wire. The video output on a VCR is a composite video signal, which can be received as video input by a television monitor.

A composite signal is a color display signal that transmits all necessary information (color, brightness, sync, and other information) together. The device that receives the composite signal must decode the various kinds of information in order to display an image. Mixing color and brightness information together, then separating the information, compromises the quality of the final image as some information is lost. Compare

with *S-video signal*, which produces a higher-quality image than composite signals.

compression

The process of reducing the size of data files to reduce storage and computer processing requirements.

contrast

The ratio between the maximum and minimum luminance (brightness) values of a display.

Digital UNIX operating system

A general-purpose operating system based on the Open Software Foundation OSF/1 technology. Digital UNIX was formerly called DEC OSF/1.

Direct Memory Access (DMA)

The ability to transfer data directly to or from memory without passing it through the central processor unit (CPU).

dithering

Controlled addition of noise to an image, in a specific quantity, for the desired number of colors.

drawable

A collective term for windows and pixmap, both of which can be used as sources and destinations in graphics operations.

frame buffer

Memory used to store an array of graphic image data. Each element of the array corresponds to one or more pixels in a video display. See also *pixel*.

hue

The color (sometimes called tint). Hue represents the frequency of color and its position in the visible spectrum.

Joint Photographic Experts Group (JPEG)

An ISO method for still-image compression. The flexibility of JPEG allows the user to achieve visually lossless results, while reducing the amount of data to be stored. The image compression is a function of a chosen quality factor, the amount of high-frequency information contained in an image, and the viewer's tolerance to the resulting visual loss. Grayscale is less compressible due to the absence of the chrominance components and the dominance of luminance, which is more difficult to compress.

luminance

The brightness or grayscale component of an S-video or composite signal. As the chrominance value gives an S-video signal its hue, luminance defines its brightness. In the NTSC color standard, luminance contains the Y signal; chrominance contains the combined I and Q signals. Luminance is used interchangeably with *brightness*.

multimedia

A set of technologies that allow for the capture, manipulation, presentation, and integration of information involving data types such as text, graphics, and images, as well as animation, full-motion video, and high-quality audio.

NTSC (National Television System Committee)

A color-encoding and decoding system for the transmission of video signals, 640 lines wide by 480 lines high at 30 Hz. The system was adopted by the National Television System Committee (NTSC) in 1953 and was the first monochrome-compatible, simultaneous color system used for public broadcasting. It was adopted by the Federal Communications Commission (FCC) for use in the United States, and is also used in Canada, Japan, and Mexico. Compare with *PAL* and *SECAM*.

OpenVMS

Digital Equipment Corporation's proprietary Open Virtual Memory System operating system.

PAL

See *Phase Alternation Line*.

Phase Alternation Line (PAL)

A color-encoding and decoding system for the transmission of video signals, 625 lines per frame at 50 Hz, used in most European countries. Compare with *NTSC* and *SECAM*.

pixel

A picture element that is the basic unit of a graphic display. A location on the monitor screen that can be selectively turned on or off. The more pixels to a screen unit, the higher the picture resolution.

raster

The electron beam that scans the image onto a picture tube. Raster images are generated with an intensity-controlled, line-by-line sweep of the electron beam across the screen. Television sets use raster displays.

read-only memory (ROM)

Memory that cannot be modified. The system can use (read) the data in ROM but cannot change it.

RGB signal

An abbreviation for red, green, blue used to indicate the most effective method of transmitting a graphics or video signal so that the information remains pure. RGB is a three-wire system: one wire is used to transmit separately each of the three primary colors. The resulting image is higher in quality than the image from S-video or composite signals. The sync signal for RGB can either be transmitted on a separate wire, or encoded on one of the R, G, or B wires.

saturation

The richness of a color, as determined by the amount of white in the color.

scaling

Enlarging or reducing all or part of a display image by multiplying its coordinates by a constant value.

SECAM

See *Système Electronique Couleur Avec Memoire*.

S-video signal

A separate video (S-video) signal that carries the luminance (brightness) information and chrominance (color) information separately. The S-video signal is the same as the composite video signal, except that the Y signal (intensity) is on a separate wire from the U-V signal. Some high-end VCRs have an S-video output for connection to high-end television monitors. Contrast with *composite video signal* and *RGB signal*.

Systeme Electronique Couleur Avec Memoire (SECAM)

A color-encoding and decoding system for the transmission of video signals, 625 lines per frame at 50 Hz. The SECAM system is used in France and the CIS (Commonwealth of Independent States). Compare with *NTSC* and *PAL*.

tint

The color (sometimes called hue). See also *saturation* and *brightness*.

video signal

A signal generated by video output devices such as a television signal, VCR, camcorder, or laser disc player.

Windows NT

"New Technology" operating system owned by Microsoft Corporation.

YUV

In the computer and broadcast worlds, three color components describe a given color. Broadcast standards accomplish sending all of the color information on one wire by modulating these three components onto one signal. CCIR601, an international standard for digital broadcast video, is specified with the chrominance (color) data (usually referred to as U and V), subsampled in X by a factor of 2, resulting in the phrase 4:2:2 YUV color space (Y is the luminance of the pixel).

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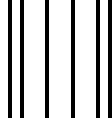
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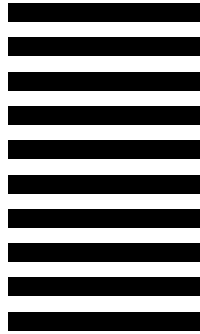
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