



# VideoWave

## Idea Guide & Reference Manual



MGI Software Corp.

## MGI VideoWave Idea Guide & Reference Manual

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Printed in Canada  
97-09 MVW2020

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*Welcome to  
MGI Video Wave*



## A. Introduction to MGI VideoWave

Welcome to MGI VideoWave, the personal video studio for your PC!

Full motion video is a relatively new phenomenon on PCs. Historically, the cost of implementing desktop video was prohibitive for all but a few professional video producers. Equipment that was attainable by the average user was either too poor in quality or too difficult to install – or both.

MGI VideoWave represents a major step toward bringing high-quality, easy-to-use, full motion video to the desktop. MGI VideoWave is the next wave in video production software.

With MGI VideoWave, you can now use video to tell a story – and have fun while you tell it! The ability to inexpensively and easily turn your PC into a video studio will revolutionize PC communications and multimedia, just as desktop publishing programs on the PC revolutionized the print industry.

### How MGI VideoWave works

*Use MGI VideoWave and your capture board to capture high quality video sources (camcorder, VCR, TV, Laserdisc, DVD, etc.).*

Use MGI VideoWave with your capture board to first capture video from a video camcorder, television, VCR, DVD, or laserdisc player. Then, use MGI VideoWave's full range of video and audio editing tools to edit your capture to your liking. You can play back captured video and audio from your hard disk, or you can view live video before and during the capture. With MGI VideoWave, you can create exciting video and audio productions!

### MGI VideoWave Features

- Motion video, audio, and image capture
- Text animation, transitions, and special effects
- Real time video preview
- Fully optimized for Intel MMX Pentium processors and uses the Intel Multimedia Solutions

## Video Ideas

You can use MGI VideoWave to provide source video material for a wide variety of applications. Here are just a few:

- edit your own videos using source material from a camcorder, VCR, television, DVD, or laserdisc player
- add "pizzazz" to business presentations by incorporating video segments
- capture still images from any video source to include into newsletters or other documents
- create training applications that incorporate digital video clips for ease of understanding
- start a business selling video source material
- watch live video from a camcorder, TV, VCR or laserdisc - right on your desktop
- capture excerpts of your favorite television program
- include video on your Web site to make it a site to remember
- create videos for sending by e-mail

MGI VideoWave helps bring your video ideas to life in ways that are only limited by your imagination.

MGI VideoWave's intuitive user interface makes producing videos as easy as using your VCR or TV remote control, giving you instant access to fabulous video effects and the latest in PC video production tools. With MGI VideoWave, anyone can become a video producer overnight.

Whatever video idea you choose, MGI VideoWave will get your message across like never before. Get ready to have the most fun you've ever had with a computer!

## About this Idea Guide

Video production, whether done in a professional television studio or on the desktop, is a very powerful and sophisticated medium. Although MGI VideoWave is very intuitive and user-friendly, a number of video production concepts should be understood before using the program. With this in mind, the user guide has been organized to give you a good working knowledge of pre-production, camcorder use, video capture, video editing, and final production that will help you create better videos. Reading this manual thoroughly



and participating in the MGI VideoWave tutorial will give you the groundwork needed to get started right away!

This Idea Guide is divided into the following sections:

**Installation** covers the system requirements and how to install MGI VideoWave onto your hard drive.

**The MGI VideoWave Interface** shows you the various tools and screens available to you for the production of your video.

**Video Publishing** shows you how to edit and manipulate your videos in MGI VideoWave. The user interface and tools are described in greater detail.

**Audio Production** discusses the editing of audio and how to incorporate audio into your video production.

**Video Capture** discusses computer video and audio capture using MGI VideoWave.

**Working with Video** gives you a valuable background on proper video camera techniques, with hints, tips, and an overview of video recording in general.

**Glossary** defines terms associated with video production.

### Please Note

Some features discussed in this manual are not present or are abridged in this edition of MGI VideoWave. Not present are *Video Animator* and *MPEG* support. The *Special Effects* and *Text Animator* sections are reduced from the full version of MGI VideoWave.

Features not present are highlighted in blue text in this documentation. These features are available in the full version of MGI VideoWave.

For details on how to upgrade to the full version of MGI VideoWave, please contact MGI Software Corp.

## Using the On-line Help

The on-line Help is designed to offer assistance while you are using MGI VideoWave. It includes some of the information present in this manual plus complete descriptions of each screen window and function of the application – for icons, tool commands, dialogs, and buttons. This can save you from having to search through the printed documentation to get information on program features.



To access Help, click on the question-mark icon, located in the upper right corner of the MGI VideoWave screen, or press [F1].

24-hour support is available via our website, which contains the latest product technical information and updates.

Should you require assistance with MGI VideoWave, please contact MGI Technical Support at:

*North America*

Telephone: **(905) 707-3573**  
Web site: **www.mgisoft.com**

*Europe*

Telephone: **(+31) 20 430 30 26**  
Web site: **www.mgisoft.com**

**Technical Support** ↑  
**Customer Service** ↓

If you would like information on any other MGI product, please contact MGI Customer Service and Sales at:

North America

Telephone: **1-888-MGI-SOFT (644-7638)**  
e-mail: **sales@mgisoft.com**  
Web site: **www.mgisoft.com**

Europe

Telephone:  
UK: **+44 1 71 365 0034**  
Germany: **+49 69 9 509 6012**  
France: **+33 1 41 91 38 07**  
  
e-mail: **sales@mgisoft.com**  
Web site: **www.mgisoft.com**

# *Installation*





## B. Installation

It's easy to install MGI VideoWave, but please keep in mind the following system requirements:

- Minimum Pentium 90 MHz processor (or equivalent), MMX recommended
- Windows 95 or Windows NT 4.0
- Minimum 16 megabytes of RAM (32 MB recommended)
- Minimum 20 megabytes of free hard drive space for application, 100 megabytes for video content
- Super VGA video card with 2 megabytes of video RAM, minimum 800 x 600 resolution at 16-bit hi-color (65,536 colors); Direct Draw Drivers recommended
- 16-bit stereo sound card and speakers
- CD-ROM drive

For video capture, you will need a capture card, TV tuner card, or a video capture enabled PC.

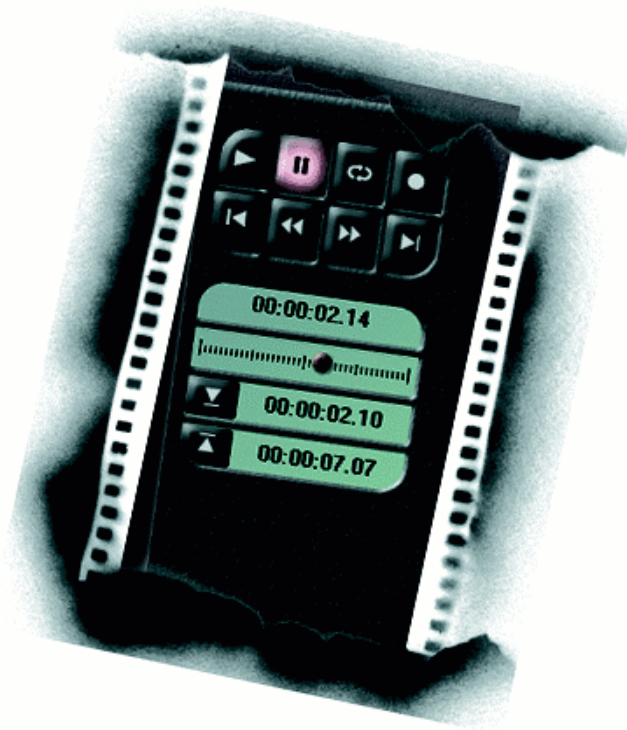
**To install MGI VideoWave on your computer, please follow these steps:**

*Windows 95 or  
Windows NT 4.0*

1. Insert the CD-ROM into your CD-ROM drive.  
The MGI VideoWave installation dialog may automatically appear, depending on the "Auto Insert Notification" setting in Windows 95 or NT 4.0. If the installation dialog appears, proceed to step 3.
2. Using Explorer, locate your CD-ROM drive letter and view the files available on the CD. Locate and run the program Setup.exe by double-clicking the file. You should then receive the "Setup is initializing. Please wait" message.
3. Click on the Install button, and follow the prompts to install MGI VideoWave.



# *The MGI VideoWave Interface*







## C. The MGI VideoWave Interface

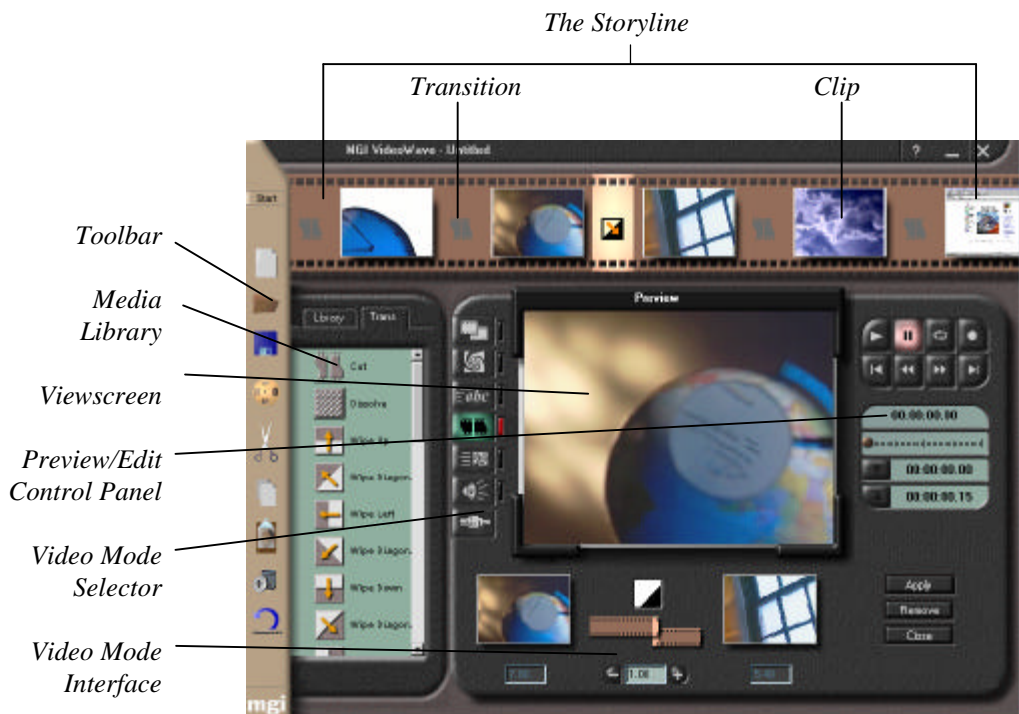
*This section gives you a brief overview of the MGI VideoWave user interface and a useful tutorial to get you started.*

**Section D: Video Publishing** provides a more in-depth review of the many features and controls found in MGI VideoWave.

### The MGI VideoWave Publishing Interface

MGI VideoWave provides a comprehensive set of tools for working with video files:

- **The Storyline** is used to arrange your video clips in the correct order and to place transitions between the clips.
- **The Toolbar** provides quick access to commonly used features such as Open, Save, Delete, Copy to Clipboard, etc.
- **The Media Library** is where your multimedia files are held for easy access. You can drag and drop clips from the Media Library to the Storyline and the Viewscreen.
- **The Video Mode Selector** toggles between editing modes, such as Video Editor, Transitions, Audio Studio, etc.
- **The Viewscreen** is used to preview your work in progress, and to play back your finished production.
- **The Preview/Edit Control Panel** allows you to play video clips using VCR-type controls such as play and record. You can also mark new beginning (in) and end (out) points of the clip.



## The Toolbar

The Toolbar, located on the left side of the display, is used to quickly access a number of commonly-used functions in MGI VideoWave.



### **New Production**

Provides you with a blank Storyline into which you can load clips, define transitions, and add special effects to create your own video production.



### **Open Production**

Opens a previously saved production.



### **Save**

Saves your Storyline to the hard disk as a “work in progress”.



### **Produce Video**

Converts your Storyline to a single, finished production video file, in standard playback format (AVI or MPG).



### **Cut**

Cuts a selected video clip or transition from the Storyline to the Clipboard.



### **Copy**

Copies a selected video clip or transition to the Clipboard.



### **Paste**

Pastes the contents of the Clipboard to the selected clip or transition box in the Storyline.



### **Delete**

Deletes the selected clip or transition.



### **Undo**

Undoes the last operation.

## The Video Mode Selector

You can toggle between MGI VideoWave's video editing functions using the Video Mode Selector, located to the left of the Viewscreen.



### Video Editor

Allows you to mark new beginning and end points of a video clip, trim or split the clip, and adjust the brightness and RGB color levels.



### Special Effects

Apply special effects to your clips. There are a number of special effects to choose from.



### Text Animator

Customize your video with text animation effects.



### Transitions

Choose from a number of transition effects to use between your video clips.



### Video Animator

Blend one clip with another for professional-looking digital video effects.



### Audio Studio

Add one or two additional tracks of stereo audio to your production, mix audio and perform audio fades.

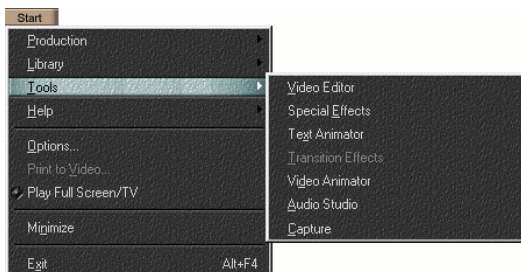


### Capture

Capture video, images and audio from an outside source, such as a TV, VCR, Camcorder, or Laserdisc player.

#### Note -

All MGI VideoWave Tool Bar and Video Mode functions can also be accessed from the Start menu. Open the menu by clicking on the Start button at the top of the Toolbar.





## The Preview/Edit Control Panel

The Preview/Edit Control Panel will look familiar to anyone who has used a VCR. Buttons exist for playback, pause, and record, among others. Use the panel to view clips, transitions, or your entire video production.

Below the buttons are linear time indicators *and* “Mark in/out point” buttons that assist in the editing of your video.



### Play

Plays the selected clip in the Viewscreen.



### Pause

Pauses the selected clip displaying a freeze-frame in the Viewscreen.



### Loop

Plays the selected clip or transition in a continuous loop.



### Record

Records from the selected source (TV tuner, VCR, etc).



### First Frame

Returns you to the first frame of the clip.



### Previous Frame

Regresses the clip one frame at a time.



### Next Frame

Advances the clip one frame at a time.



### Last Frame

Takes you to the last frame of the selected clip.

*With the Mark in point and Mark out point buttons, you choose the start and finish points of the clip, by editing out unwanted portions at the beginning and end of the clip.*

**Duration** shows how long the selected clip is in minutes, seconds and frame count, and elapsed time as clip is played.



**Time slider** indicates how far the clip has run. You can move the slider with the mouse, to advance or “rewind” the clip.

**Mark in point** allows you to set the beginning point of the clip, omitting the portion of the clip before that point.

**Mark out point** allows you to set the ending point of the clip, omitting the portion of the clip after that point.

## The Storyline

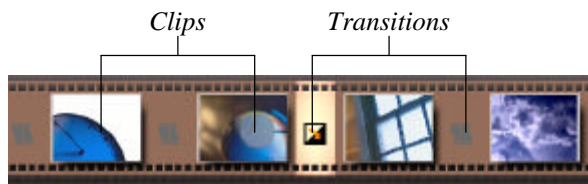
The **Storyline** is where you assemble your video production, combining video clips, transitions, text animation and special effects. As you can see from the illustration below, the Storyline is composed of slots, or boxes, of which there are two types: one designed to hold *Clips*, and the other *Transitions*. While only a few slots are viewable on the screen at any one time, you can have an unlimited number of clips and transitions for longer video productions. As you fill the slots, you can scroll the Storyline horizontally, to add additional clips and transitions.

**Clip** - video footage composed of a single subject or shot. Can be anywhere from less than a second to several minutes in duration.

**Transition** - used between clips. Can be as short as a cut, or longer, using fades, blends, etc.

**Scene** - an edited portion of your video. Can be one or more clips, or a transition.

**Video Production** - your entire video, including scenes, clips, transitions, and sound.



To scroll, move the mouse pointer over the Storyline; the cursor will change to a hand. Click and hold the left mouse button, and then drag the Storyline to the left or right.

To create a video production, you arrange in order all your video clips using the slots in the Storyline, and then select transitions to use between them.

For more information about the Storyline and the editing of clips and transitions, see section D: Video Publishing, *Using the Storyline to Build your Production*.

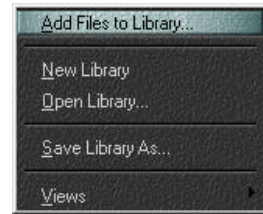
## The Media Library

To load files (video, sound, or images) into the Media Library, right-click the Media Library and select 'Add Files to Library' from the menu displayed.

The Media Library acts as a holding place for easy access to your multimedia clips.

Loading clips into the Media Library is easy.

1. Position the mouse pointer over the Media Library and right-click.
2. From the menu displayed, choose "Add Files to Library...".
3. Browse your hard drive or CD-ROM for clips to load into the Media Library.



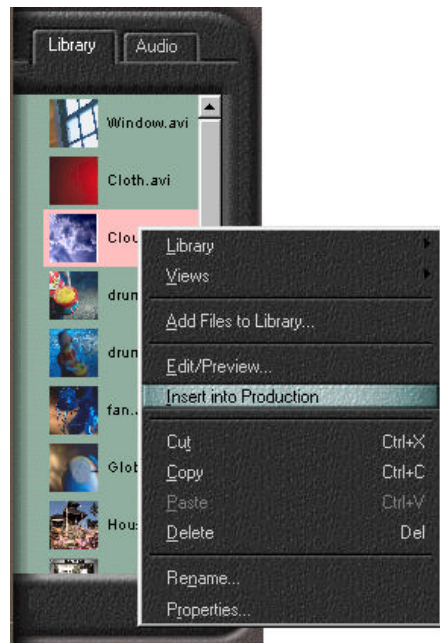
**Tip** - The quickest way to place an audio or video file onto the Storyline is to simply drag it from the Media Library and drop it onto the Storyline at the desired location.

You can create a Media Library file and then save it to your hard drive. This lets you draw from different Media Libraries to build each of your productions. To save a library, right-click over the Media Library and choose "Save Library As..". From the menu displayed choose a name and destination for your library, and click "OK".

To transfer clips from the Media Library to the Storyline, you can:

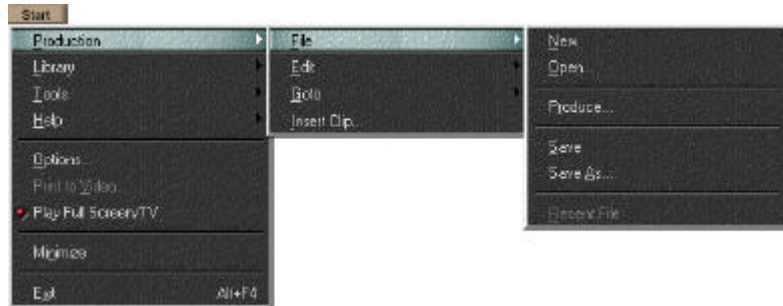
1. Drag and drop from the Media Library to the Storyline, or,
2. Right-click the clip in the Media Library, and choose 'Insert into Production' from the menu displayed.

Once your clips are loaded into the Media Library, you can easily drag and drop them onto the Storyline or Viewscreen. You can also right-click a clip in the Media Library, and select "Insert into Production" from the menu displayed. This will insert the selected clip into the highlighted slot in the Storyline.



## The Start Menu

The Start menu includes all of the functions found in the Toolbar and Video Mode Selector, plus Library file options, Print to Video, and Production settings.



### Play Full Screen/TV

“Play Full Screen/TV” lets you preview the clip using your monitor as if it were a TV screen. When you press Play with this option selected, the clip is played back full-size on your monitor screen, rather than in the MGI VideoWave Viewscreen. This lets you see a closer approximation of how your video will look on a TV screen. When the clip is finished playing, you will be returned to the regular MGI VideoWave interface. Press the ESC key to exit back to the regular interface while the clip is playing.

To play clips in the regular Viewscreen, click on the “Play Full Screen/TV” option in the Start menu (the red indicator in the menu is no longer illuminated).

### Print to Video

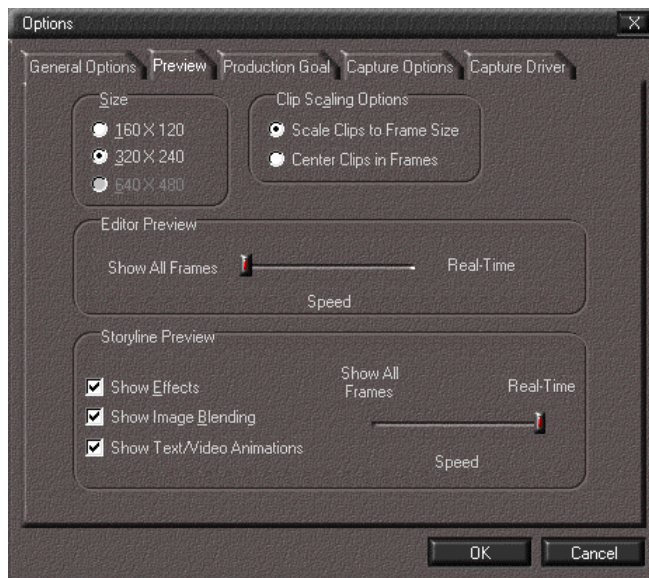
This option will play your video to any external source you may have connected to your computer (provided your capture card supports this feature), such as a TV set or VCR. You may record to your VCR’s videotape using this feature.

## Options

The “Options” item from the Start menu is used to set the general preferences for the operation of MGI VideoWave and the default values for producing your video. This saves you from having to go through the settings each time, if you regularly produce to the same destination and quality.

**General Options** sets the user preferences in the operation of MGI VideoWave.

**Preview** allows you to set the frame size of the clips as they are shown in the Storyline, plus the frame rate as they are played in the Viewscreen. Because video is very processor intensive, there is sometimes a tradeoff between the number of frames shown versus the speed of the clip. The computer may not be able to “keep up” to the video, resulting in slower video playback or some frames being “dropped” from playback.



You may wish to see all frames, even though the playback speed of the clip may be compromised. Or, you may wish to see the clip at full speed, even though some frames may not be shown in playback. The degree of compromise depends on your processor speed and system overhead.



If some frames appear to be “dropped,” it simply means that the processor cannot “keep up” with the video playback. The frames still exist, however, and will be saved with your production.

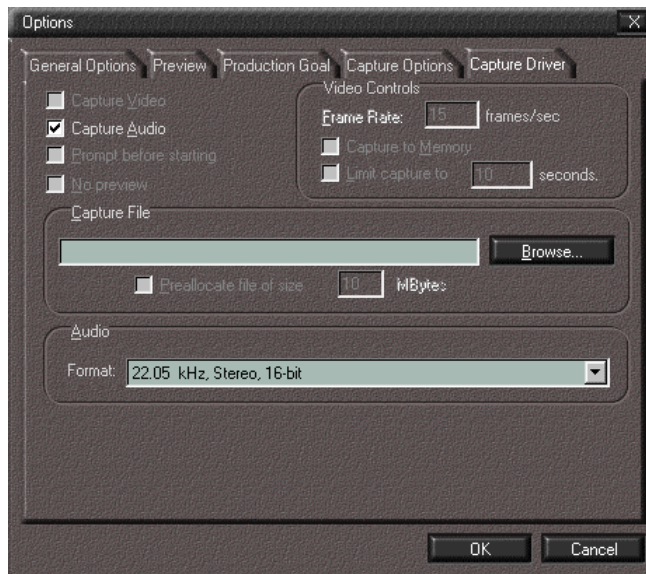
**Production Goal** displays preset default production values for such items as sound quality, frame size and frame rate, depending on the destination of your production. After selecting the destination (Internet, Videotape or CD-ROM), you then set the desired quality for that destination (*Premium*, *Good*, or *Basic*). Due to the differing video and audio specifications for each destination, the default settings will be different for each.



For example, a video designed for the Internet will have somewhat different requirements than that designed for tape, which itself will be different than CD-ROM. Selecting *Premium* quality will result in a file that takes up much more storage space than *Good* or *Basic* quality setting. However, the finished production will be more impressive.

**Capture Options** allow you to set the destination directory and the preview frame rate of captured video. You can choose to have no preview, or you can set the frame rate from 1 to 30 frames per second. You can also choose to have video *Overlay*, which is real-time video displayed on the Viewscreen from your capture card.

**Capture Driver** sets the frame capture rate, the audio quality, and other options. *Capture to Memory* is faster than capturing to your hard drive, but is only possible if you have enough free memory (RAM). *Limit Capture to...* sets a limit to the time (and therefore the file size) of capture.



## Video Mode Changeable Interface

The Video Mode Interface (displayed below the Viewscreen) changes according to the mode selected. For details on the operation of all modes, see section D, *Video Publishing*).



If you open the **Video Editor**, you are presented with editing tools for brightness, color levels, split, and trim.

In this mode, the preview will show you how the clip will look with any changes to brightness, color, etc. Depending on your processor speed, the preview may be in real time or slower.

For an in-depth description of the tools in each video mode, see **Section D, Video Publishing**.



*Video Editor open*



If you do not wish to make any changes to a clip, click the *Close* button to close the editor. You can click Play to view the clip.



*Video Editor closed*



If you select **Special Effects**, the following interface, or editor, is added below the Viewscreen:

You can drag any effect from the library and drop it in the Special Effect indicator box below the Viewscreen.

**Note:** Some special effects shown are only available with the full version of MGI VideoWave.



You can add special effects such as *Swirl* or *Ripple* to your video. Use the effect as a transition, over a clip, or as a clip itself. Several options are available, and experimentation is encouraged.



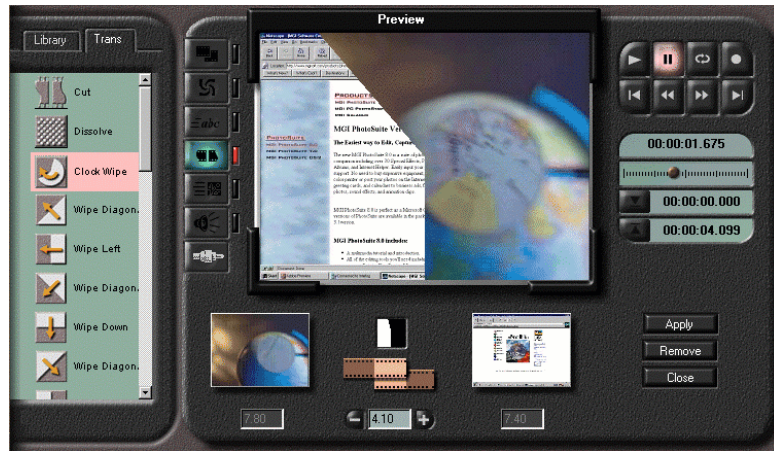
**Text Animator** allows you to add captions to your videos. Options exist for text size, color, and the direction the text moves on and off the screen.

**Note:** Some Text Animator functions are only available with the full version of MGI VideoWave.





If you double-click a Transition box in the Storyline, or select a Transition box then click the Transition Effects button in the Video Mode Selector, the **Transition Editor** appears:



There are several different types of transitions you can use, as indicated in the *Trans* panel added to the Media Library. Drag a transition from the Library to the small box in the Transition Editor, just above the small “filmstrips.” The selected transition is shown as the center box above the Set Duration arrows. The preceding video clip is shown to the left of the selected transition, and the succeeding video clip is to the right.



**Video Animator** allows you to fade or blend one clip over another for interesting effects.





**Audio Studio** allows you to add one or two audio clips to your video production.

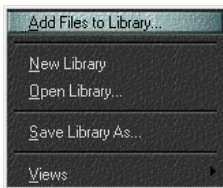


Depending on your capture hardware, the **Capture** interface may allow you to capture video and audio from an outside source, such as a TV, Camcorder, VCR, DVD, or Laserdisc player.



## Tutorial: Your First Production

MGI recommends that before beginning this tutorial, you first copy the .AVI files you will be using (*clouds.avi*, *globe.avi*, and *webpages.avi*) from the CD to your hard drive. Your hard drive will give your computer faster access to the files than the CD-ROM drive, so you will not have to wait as long for files to load and play.



MGI VideoWave's intuitive user interface and the MGI Multimedia Content CD let you produce your first video in just a few minutes. This tutorial will help you become familiar with the video post production process (that is, the editing you do after you have a finished shooting and capturing a video clip), and introduce some of the MGI VideoWave functions.

### Loading Media Clips into MGI VideoWave's Media Library

1. Place the MGI VideoWave Multimedia Content CD in your CD-ROM drive.
2. Position the mouse cursor over the Media Library located on the left side of the MGI VideoWave Interface.
3. Click the right mouse button.
4. From the menu displayed, click "Add Files to Library...".
5. Browse the CD and click the AVI Files directory.
6. Select **clouds.avi**, **globe.avi**, and **webpages.avi**. Click "Open".
7. The files with thumbnails (small pictures) of the first frame will appear in the Media Library.
8. Drag and drop **clouds.avi** into the Viewscreen.

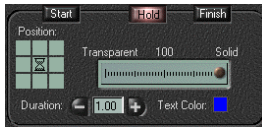
1. Press the Play button in the Preview\Edit Control Panel. Watch the clip play in the Viewscreen.

### Adding Text Animation to your Video Clip

1. Click the *Text Animation* button in the Video Mode Selector.
1. In the *Text Editor* window, type "Internet World".
1. Click the *Font* button.
2. Select a font, bold, 28 pt., center the text, and click "OK."

In the Viewscreen you will now see the text laid over your clip.





5. Click the Text Color box, and select light blue.
6. Click the *Start* button and select the bottom center square in the Position box.
7. Move the Time Slider a short distance with the mouse, and click the *Mark Start* button. This will be the point in the clip at which the text first appears.
8. Click the *Hold* button and adjust the slider to the point at which you would like the text to hold its position. Click the *Mark Hold* button.
9. Select the center square in the Position box, and set a duration of 1 second. This will keep the text stationary for 1 second in the center of the screen.
10. Click the *Finish* button. Select the top center square in the Position box, and move the Time Slider to the point at which you would like the text to leave the screen. Click the *Mark Finish* button.
11. Click the *Apply* button, then press *Play*.

You should see a preview of the text animation with the text scrolling from the bottom to the center of the screen, holding for 1 second and then scrolling off at the top of the screen.

Congratulations! you have created your first text animation.

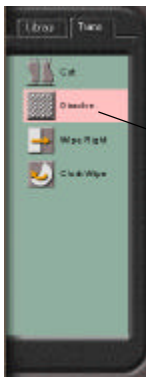
### Adding Transitions Between Video Clips



1. Drag and drop **globe.avi** from the *Media Library* into the next empty box in the *Storyline*, and then drag and drop **webpages.avi** into the next box.
2. Using your mouse, highlight the transition marker between **clouds.avi** and **globe.avi**.
3. Go to the left side of the Viewscreen and click the Transition button in the Video Mode selector.

A panel called *Trans* is added to the Media Library. Within this panel you will see a selection of transitions.





4. Drag and drop the second transition in the list, called Dissolve (it looks like a checker board) to the Transition box in the Transition Editor. Notice how the Transition box shows you what the transition you selected looks like.

*Drag and drop*



*The two small film strips in this dialog represent the length of the two clips in the Storyline.*

*Spin Control (duration)*

5. To adjust the overlap of the two clips, drag one of the small film strips to the left or right or use the *spin control* (the - and + buttons) until you see 1 second in the Duration box.
6. Click *apply*.
7. Repeat steps 2 through 6 between **globe.avi** and **webpages.avi** except this time select the Clock wipe.

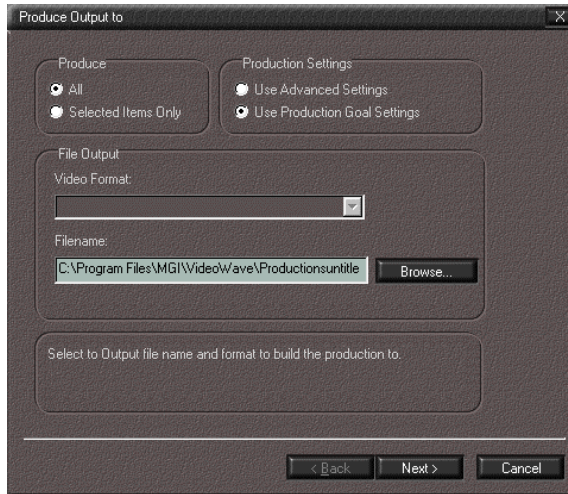


### Producing your Video

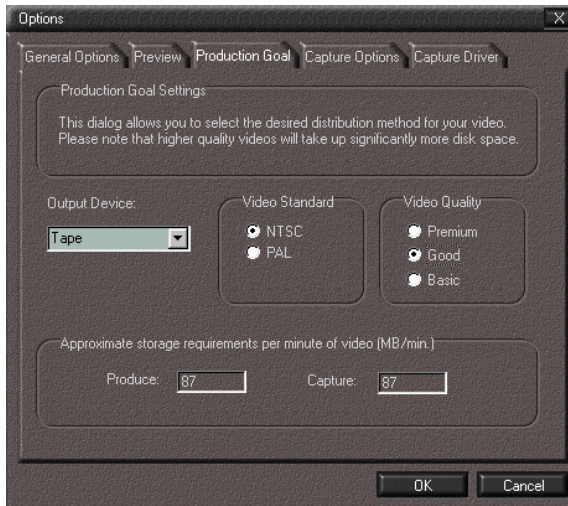


1. Click the *Produce Video* icon in the Toolbar. The “Produce Output To” dialog will appear.

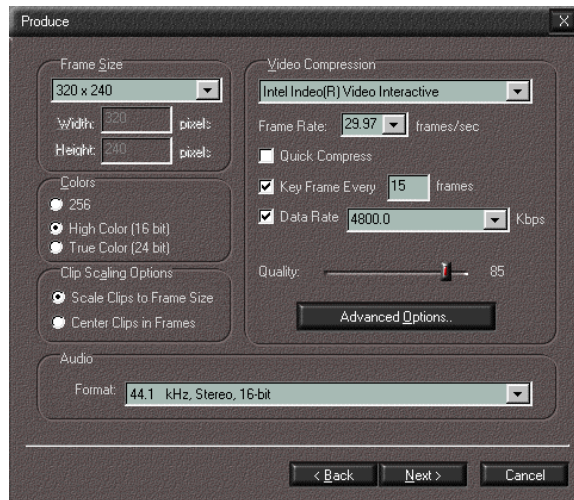
If you have elected to choose the *Use Production Goal Settings* (see Options: *Production Goals* from the Start menu), the production will be simplified, as most of the settings used will already have been determined automatically. In this case, skip to Step 5.



From the Start menu, click *Options* and then *Production Goals* to view the settings for each output medium (Internet, Tape, or CD-ROM). For Output Device, choose *Tape*, and for Quality, choose *Basic*.



If you chose Use Advanced Settings, you can manually set the production values.



2. For Frame Size, select “320 x 240”.
3. For Frame rate, select “15”.
4. For Colors, select “High Color 16 bit”.
5. Click Next.
6. Click *Produce*.
7. You will now see the frames of the video being produced by MGI VideoWave.

This will take a few minutes. When complete, you can rewind and play back the final video as many times as you want. Your new file will automatically be dropped into the Media Library.

Congratulations! you have just produced your first video.

Don't forget to read the rest of this manual to see all the other amazing things you can do with MGI VideoWave, like Special Effects, Video Animation, and adding music to your videos.



If you need additional help, click the Help icon, located in the upper right corner of the MGI VideoWave screen. Help is available for each function. See page 10 for additional on-line Help information.



# *Video Publishing*





## D. Video Publishing

This chapter will show you the basics of putting together a real video production. MGIVideoWave lets you develop a video presentation the way you prefer. As you become familiar with the software (and depending on the type of project), you will develop your own production style, doing different things at different stages. In all cases, however, creating a video production involves the following basic steps:

- Selecting the source material.
- Editing the source material to create scenes.
- Assembling the scenes and incorporating transitions.
- Producing the final video presentation file.

### Understanding Digital Video

When discussing digital video, it is best if we first understand its origins: motion pictures and analog video.

#### Film and Motion Pictures

We are all familiar with photographs and movies. Photographs are taken with a roll of film, which is then chemically developed into the continuous-tone photograph. A reel of film is made up of many still photographs placed in sequence, which, when played back on a movie projector, appear to blend together into a motion picture.

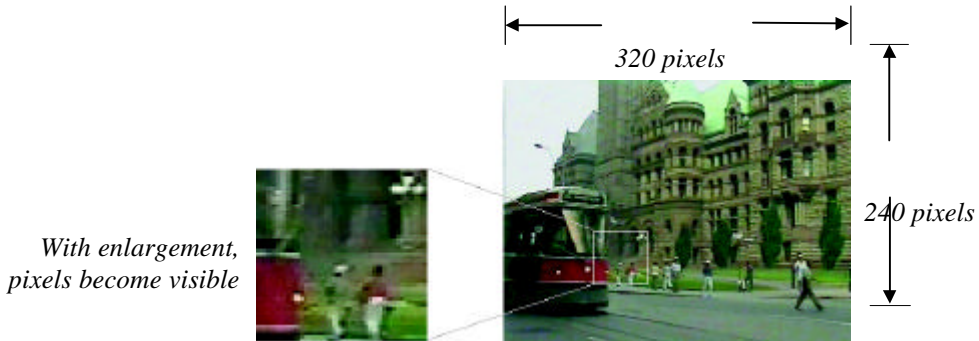
#### Analog Video

Video cameras record images onto magnetic tape rather than film, and require no developing - the tape can be played back immediately after recording. Video tape has become more convenient and economical than film for home movies, and has thus become more popular for home use than the traditional 8mm movie camera. Video from almost any source (TV, VCR, camcorder, laserdisc) can be converted to digital form using a PC equipped with a capture board, for use in personal computer video applications such as MGI VideoWave.

#### Digital Video

Like motion pictures and analog video, digital video is made up of many still images, though in digital form they are called bitmaps. A bitmap image is made up of many small pixels of different colors and shades, which when taken together form a single image. The pixels

are arranged in rows and columns, and the number of pixels that make up the width and height of the image determines the frame size of the file. When these digital images are played back in sequence, the result appears to be a video of continuous motion. With an included audio track, there is sound to accompany the video.



For more information on Compression, see Section F, Capture Options, Compression.

Some manufacturers market digital video camcorders, which record digital video to tape. DVD (Digital Video Disk, sometimes called Digital Versatile Disk) is digital video on a CD-like disk. DVD uses compression to place a full length movie onto a single disk.

### File Types You Can Use

MGI VideoWave accepts digital Video, Audio, and Graphic Image files, in several different formats:

<i>File Type</i>	<i>Format</i>	<i>Extension</i>
<b>Video</b>	Audio Video Interleave	.AVI
	Apple QuickTime	.MOV
	MPEG	.MPG
<b>Graphic Image</b>	Bitmap	.BMP
	Tagged Image File	.TIF
	Targa	.TGA
		.PCX
	Encapsulated PostScript	.EPS
	Windows Metafile	.WMF
	Graphics Interchange Format	.GIF
<b>Audio</b>	Waveform Audio	.WAV
<b>Production</b>	MGI VideoWave Production	.SBD
<b>Library</b>	MGI VideoWave Library	.VWL



After editing and assembling your source material, your finished MGI VideoWave production will be an AVI or MPG file.

Frame rates can vary from 5 to 30 frames per second. Some data rates (uncompressed) for various frame rates and window sizes are shown below:

<i>Video Window size (pixels)</i>	<i>Frame Rate (per second)</i>	<i>Resulting file size</i>	
		<i>(per second)</i>	<i>(per minute)</i>
160 x 120	10	34 KB	23 MB
160 x 120	15	575 KB	34.5 MB
320 x 240	15	2.3 MB	138 MB
640 x 480	30	18.4 MB	1,100 MB

**Frame Size** – Standard frame size for TV is 320 x 240. While this is a good viewing size for editing, it takes up a large amount of memory on your hard drive. The default frame size in MGI VideoWave (and the standard frame size for Internet files) is 160 x 120. This setting results in productions that take up much less storage space.

**Frame Rate** – Frames per second (fps). The standard for TV is 30 fps, but 15 fps is more acceptable on the PC and requires less storage space.

*For more information on Compression, see Section F, Capture Options, Compression.*

**Compression** – Some compression methods retain all data, but are slow in compressing and decompressing. Others are much faster and compress to a much smaller size file, but lose some data in the process. If you want to retain quality after capturing from a high quality source (such as S-Video), use a lower compression ratio. With lower quality sources such as standard VHS or TV, you can use more compression without experiencing noticeable image degradation.

### **Compression Quality**

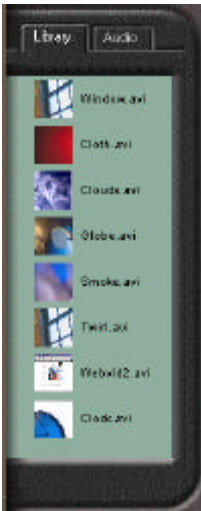
*Higher quality* increases the importance of clear, accurate images at the expense of motion.

*Lower quality* decreases the emphasis on images, and increases the emphasis on other video characteristics, such as color and motion.

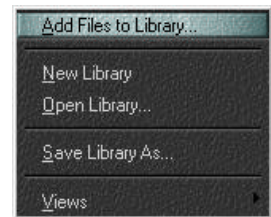
## Loading Files

Before you begin to produce your video, you must choose which media files you want to include in your Storyline. The files you choose will form the basis of your video production.

Files are browsed from sources such as your hard drive or CD-ROM, and are added to the *Media Library*, shown at left. From the *Media Library*, files can then be placed onto the *Storyline*. To place files onto the Media Library:



1. Right-click the mouse inside the Media Library
2. From the menu that appears, choose *Add Files to Library*. Browse through your hard drive or CD-ROM and double-click the desired files to add them to the Media Library.

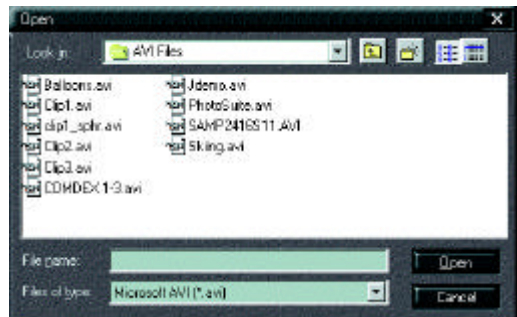
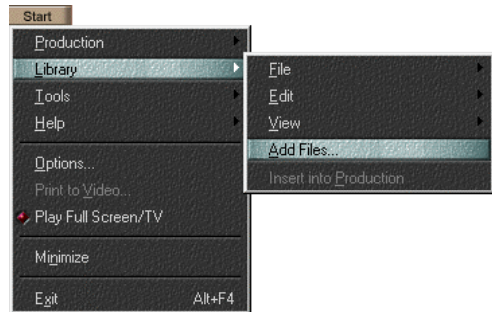


Another way to load clips into the Media Library is from the *Start* menu.

To load files to the Media Library, you can:

1. Right-click the Media Library and select 'Add Files to Library ...', or
2. Select 'Library ...', then 'Add Files ...' from the Start menu.

1. Click the Start button at the top of the Toolbar. Select "Library..." then "Add Files..." from the menus displayed.
2. The *Open* dialog will appear, from which you can browse your hard drive or CD-ROM for video clips, image files or audio files to add to the Media Library.



## Using the Storyline to Build your Production

**Tip** - *The quickest way to place a video file onto the Storyline is to simply drag it from the Media Library and drop it onto the Storyline at the desired location.*

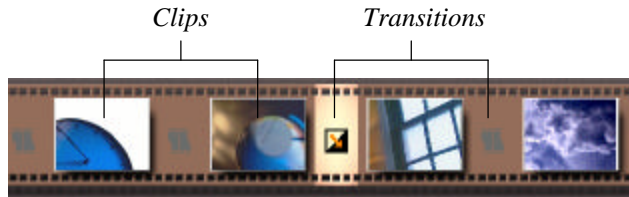
*To transfer clips from the Media Library to the Storyline, you can:*

1. *Drag and drop from the Media Library to the Storyline, or,*
2. *Highlight the clip in the Media Library, then right-click and choose 'Insert into Production.'*

*Right-clicking a clip in the Storyline opens the following menu:*



The Storyline is where you assemble your video production, combining video clips, transitions, text and special effects. To place images and videos on the Storyline, highlight one of the empty slots in the Storyline by clicking it with the left mouse button. Then, double-click the file you wish to load in the Media Library. You can also drag the file from the Media Library to the Storyline.



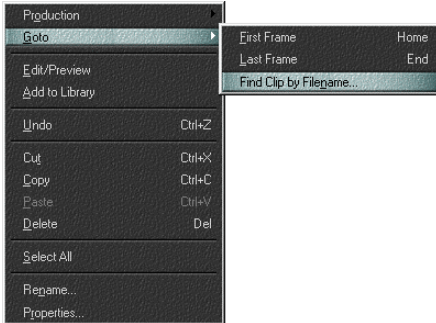
While only a few slots are viewable on the screen at any one time, you can have any number of clips and transitions (limited by available computer memory) for longer video productions. As you fill the slots, you can scroll the Storyline to add additional clips and transitions.

To scroll, move the mouse pointer over the Storyline, click and hold the left mouse button, and then drag the Storyline to the left or right.

To create a video production, you arrange in order all your video clips in the slots provided, and then select transitions to use between them.

### The Storyline Menu

When you right-click a clip in the Storyline, a menu appears listing many of the same editing commands found on the Toolbar and Video Mode selector. You can cut, copy or paste clips to the Storyline, save the Storyline, or produce your video. If you choose "Select All," the entire contents of the Storyline will be highlighted for sequential playback in the Viewscreen of all clips and transitions.



The “Goto” menu item allows you to go to the first or last frame of the selected clip. If you choose “Find Clip by Filename,” a list of all clips in the Storyline will be presented, allowing you to find a specific clip. This is useful if you have more clips in the Storyline than are visible at one time without scrolling.

If you right-click a transition slot in the Storyline, a similar dialog will appear, offering many of the same functions. Selecting “Edit Transition” will open the Transition Editor below the Viewscreen.



### Combine Clips

To produce a video that contains only selected clips from the Storyline, right-click the mouse over one of the selected clips. Choose *Combine Clips* to open the Produce Video dialog. Only those selected clips will be saved as a production.

### Rearranging the Clip Order

Once you have clips and transitions in the Storyline, you can rearrange them in any order you wish. Simply click and hold the item, and drag it to the desired location. If you move one item over top of another, the second item (and everything after it) will be shifted one space to the right. You can also use the Clipboard to cut and paste clips and transitions.



### Editing Source Material in the Storyline

Select the clip in the Storyline you wish to edit by double-clicking on it with the mouse. Or, you can right-click the clip and select “Edit/Preview.” The clip will appear in the Viewscreen, allowing you to edit and apply effects to it.

### Selecting a Clip on the Storyline for Preview

You can select a clip in the Storyline for playback in the Viewscreen. If you double-click a clip in the Storyline (or drag and drop a clip from the Storyline to the Viewscreen), the first frame of the clip will be displayed in the Viewscreen. You can also right-click the clip and

select “Edit/Preview” for the same result. Press Play in the Preview/Edit Control Panel to preview the clip.

### **Quick Preview**

You can play back a group of clips, and any transitions between them, in sequence. Select the entire Storyline by right-clicking the mouse over the Storyline, and then choose “Select All” from the menu displayed. Or, select just a few clips by clicking them with the mouse while you hold down the [Shift] key. Press *Play* in the Preview/Edit Control Panel to view the selected clips and transitions in the order they appear in the Storyline.

### **Save Storyline**



Click the *Save* icon (or right-click the Storyline and choose “Production,” then “Save” or “Save As”) to save your Storyline as a “work in progress” .SBD file before producing your final video. An .SBD file references the transitions used and clips (video, audio, or images) that are already stored on your hard drive to build the Storyline, rather than producing a whole new file. Thus, saving a Storyline uses less disk space than producing to an AVI file.

## Video Editor

The Video Editor is designed to perform a number of tasks to modify your video clip and prepare it for production.



### Marking In/Out Points

By using the in/out point markers, you can define the portion of the video clip you wish to use. You can find the exact frames you want the clip to begin and end with by either moving the slider and watching the frames in the Viewscreen, or by using the Step Forward and Step Backward buttons in the Preview/Edit Control Panel. Once you have selected the desired start frame of the clip, click the **Mark In Point** button, then go to the last frame, and click the **Mark Out Point** button.

*In/  
Out  
Points*

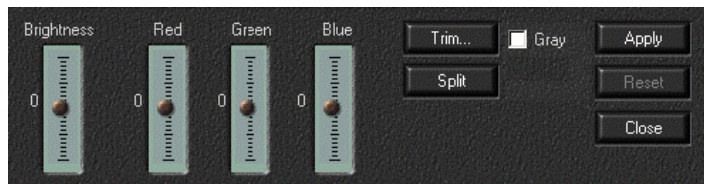


Marking In/Out points identifies the portion of the video clip you wish to use, and discards everything else. The file held in the Media Library your hard disk is not altered. In/Out points can be removed or changed by simply resetting them.

To reset the points, hold down the [Shift] key while clicking the left mouse button over the *In Point* or *Out Point* buttons.

## Trim

Trimming a video clip is similar to marking In/Out points, with one important difference. Any frames present before the In Point will be discarded permanently, as will any frames present after the Out Point. Once In/Out points have been marked, and you click the Trim button, you will be prompted to save the trimmed file under a new file name. Trimming is especially useful for removing unwanted frames at the beginning and end of a clip that has been captured. One important benefit of keeping only clips, and portions of clips, you will need for the production is greatly reduced disk space usage.



## Split

By moving the slider to the appropriate frame, you can split a clip so that it is treated by MGI VideoWave as two separate clips. An example of where it may be preferable to split a clip:

- Video which has camera shot or angle changes, and you would like to add a transition between the two. By splitting the video clip, you insert the two portions on either side of a transition slot in the StoryLine.

## Brightness and Color Adjustments

The four sliders labeled *Brightness*, *Red*, *Green*, and *Blue* allow you to apply fine adjustments to the brightness and hue of a video clip. By moving the sliders up or down, you will see the video frame on the Viewscreen change accordingly. After adjusting the brightness and colors to your liking, click the *Apply* button.

## Gray

To change your color video into a black & white (grayscale) video, click the *Gray* check box.

These controls can also be used to add some interesting tinting effects to video, such as fade in, fade out, color fades, adding tone to a gray video to simulate an old movie, and more. Experimentation is encouraged, and until you produce the video, all changes to the video clip will not be permanent – they can be modified or removed.

### Adding Still Images to your Video

You can add still images to the Storyline, and edit them the same way you would a video clip. Simply load the image (BMP, TIF, GIF, etc.) into the Media Library as you would a video clip. Drag the image from the Media Library to the Viewscreen.



Open the Video Editor by clicking the Video Editor button. The Editor will open as it does with a video clip, except for the addition of the *Spin* (+ and -) controls.



These controls allow you to set the time the graphic image will remain on screen when played. After you have entered the time you wish the graphic to play, click *Apply*. The graphic, in effect, becomes a video clip. You can adjust brightness, apply special effects, split the clip, and otherwise edit it as you would a video clip.



## Special Effects

There are a number of special effects you can apply to your video production with MGI VideoWave.



If you click the Special Effects button in the Video Mode selector, the **Special Effects** interface will appear.

*Double-click on the preferred effect or drag to the small Special Effect window.*



### To apply a special effect to your clip:

1. Choose a special effect in the Media Library, and drag it to the small Special Effect window.
2. Click *Start*, then advance the Time Slider to mark the point in the clip where the effect will begin. Click the *Mark Start* button.
3. Use the Effect Level slider to set the intensity of the start effect.
4. Click *Finish*, then advance the Time Slider to mark the point in the clip where the effect will end. Click the *Mark Finish* button.
5. Set the intensity of the finish effect with the slider.
6. When you are satisfied with the settings, click *Apply*.



**Swirl** – Literally stirs your video into a swirl of colors.



**Spherize** – Appears to stretch the video over a curved shape. It will appear as if it were being stretched over a ball or sphere, taking on elongated proportions.



**Brighten** – Lightens your video.



**Tile** – This very interesting effect breaks up your video into a series of square tiles with black spaces between each one.



**Relief** – Gives your video a 3-D effect, making it stand out and appear to have texture. Use this effect to make your video appear to have another dimension. For example, a video of the moon's surface would appear very real, or tactile, when the Relief effect is applied.



**Ripple** – This gives your video a rippled or bumpy effect displayed as a series of concentric rings. This can make your video appear as if it is under the surface of water.



**Smoked Glass** – Using the Smoked Glass effect is like looking through a tinted window – it allows you to see your photo behind a dark filter for a mysterious effect.



**Oil Painting** – This effect almost suggests the appearance of brush strokes in a painting, turning your video into a work of art.



**Oval Frame** – This effect puts your video into an oval frame.

### **Applying Special Effects to Still Images**

You can apply any of the Special Effects listed to still images, the same way you would apply them to video clips (see *Adding Still Images to your Video*).

## Text Animator



Clicking the Text Animator button presents the Text Animator interface below the Viewscreen. This feature allows you to add text to your videos, for titles, credits and captions.

You can have the text flow onto the screen from one of several preset directions, or you can have your text simply appear in the center of the screen using the Center Hold preset. Text will remain on the screen for several seconds.

*Preset values for Start / Hold / Finish text direction. Double-click on the preferred preset direction to apply.*



Options exist for the text direction and duration for each of *Start*, *Hold*, and *Finish*, for a high degree of user control.



1. Choose the clip you wish to place text into by dragging it to the Viewscreen.
2. Click the mouse in the text editor window. After typing the text, click the *Font* button to choose the typestyle and size.

**Note:** Some Text Animator controls shown are only available with the full version of MGI VideoWave.



3. Choose the color of the text by clicking on *Text Color*.

### Start:



1. Click the *Start* button. In the *Position* box (the small grid of squares), choose the direction from which you would like the text to enter the screen.
2. Move the Time Slider to the point in the clip at which you would like the text to enter the screen.
3. Adjust the transparency of the text using the slider.
4. Click the *Mark Start* button.

### Hold:



1. Click the *Hold* button. In the *Position* box, choose the area of the screen where you would like the text to hold position.
2. Adjust the Time Slider to the point at which you would like the text to begin holding its position.
3. Adjust the transparency of the text using the slider.
4. Click the *Mark Hold* button.
5. In the *duration* field, specify the amount of time (in seconds) that the text is to remain stationary on the screen.

### Finish:

**Tip** - You can have different transparency values for your text in each stage of the effect, *Start*, *Hold*, and *Finish*. This makes it easy to fade the text in and out of the video.

1. Click the *Finish* button. In the *Position* box, choose the direction in which you would like the text to leave the screen.
2. Move the Time Slider to the point in the clip at which you would like the text to leave the screen.
3. Adjust the transparency of the text using the slider.
4. Click the *Mark Finish* Button.

When you are satisfied with the effect, select *Apply*.

## Transition Editor



Transitions are cinematic effects that indicate and reinforce the flow from one idea to another. They are used between video clips, to provide a means of introducing or changing clips. Transitions can be as simple as a cut (where there is simply an instantaneous change to a new clip), to complex fades or blends from one clip to another, designed to invoke a specific mood.



If you double-click a Transition box in the Storyline, or click the *Transition* button from the Video Mode selector, the **Transition Editor** appears.

Use transitions to :

- Guide your audience's attention to specific screen areas.
- Maintain coherence when moving between contexts.
- Alert audiences to new objects and changes to your video presentation.
- Reinforce the action.

*Transitions*

*preceding video clip*

*duration*

*succeeding video clip*

*set duration indicators*

*selected transition*

**Tip** - Use longer durations (1 or 2 seconds) for same-subject transitions, and shorter durations for new-subject and breaking transitions (0.5 to 1.5 seconds, or less).

After selecting the desired transition, you can set its duration by moving the small film strips left or right, or by clicking the *Spin Control* buttons, or manually typing the time in the box below the arrows. Click *Apply*. The selected transition will be placed in the highlighted transition slot in the Storyline.

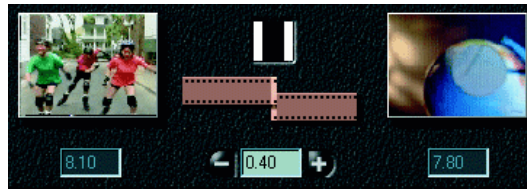


The default transition in MGI VideoWave is a cut. To change to another transition:



1. Drag video clips from the Media Library to the Storyline in the order they are to appear in your production.
2. Highlight the transition box in the Storyline between the two clips by clicking it with the mouse.
3. Click the Transition Editor button to open the Transition interface.
4. From the list of transitions in the library, select and drag a transition to the small Transition box in the Transition Editor (also described in the tutorial).

*Some transitions work better than others for certain scenes, especially if you are working towards a specific ambiance or emotional message in your production. For more information on choosing which transition will yield the most aesthetically pleasing results for a given type of scene, see Section G, Working with Video (Video Concepts: Transitions).*



5. When the transition slot in the Storyline is highlighted, the selected transition, and the video clips on either side of it, will be displayed in the transition control editor. The duration of each clip is shown below the clip window, and the duration of the transition is shown below the transition window. The two film strips represent the length of each clip relative to each other, and the film overlap represents the duration of the transition (all values are in minutes:seconds).
6. You can adjust the duration of the transition by moving the small film strips left or right with the mouse, or by clicking on the + or - *Spin control*, or by directly entering the value in the time window.
7. Click *Apply* to set the transition values into the Storyline.

**Tip-** *To place a transition in the middle of a clip, split the clip at the point you want to place the transition (see Split in the Video Editor section).*

## Transitions



**Cut** – the most common transition. It providing no break or graphics between clips. The default Storyline transition.



**Dissolve** – fades from clip 1 to clip 2 over the time specified. Often a good choice for an opening transition (the start of your production), and is also useful for same-subject breaks, or breaking transitions if a solid color is used as the fade.



**Wipe** – moves the new clip over the old in the direction you choose. You can slide the next clip over the previous, or push one clip off the screen with the other. Useful for new subjects.



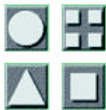
**Blinds** – the transition looks like Venetian blinds, and can be set to run horizontally or vertically. A fairly dramatic effect, and is best for new-subject and breaking transitions.



**Clock Wipe** – this transition looks like the hands of a clock. It is useful for implying the passage of time.



**Boxes** – random boxes appear to create the transition from one clip to the next. Can be used almost anywhere, but don't overuse because it is a very noticeable effect.



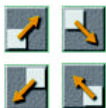
**Spot Wipe** – clip 2 appears over clip 1 in a growing shape. This is a useful transition for video clips that have the subject located in the center of the frame. Best for breaking transitions, but in the right situation (dramatic is the key word here) it can be as effective as a new-subject transition.



**Sliding Bands** – numerous bands interlock like teeth in a comb, with clip two sliding over the top of clip one. A good new-subject transition, although it is sometimes effective as a same-subject transition as well.



**Center Split** – a very good breaking transition. Clip 2 (or, a solid color) comes in from both sides like a closing door.



**Corner Wipe** – clip 2 slides over clip 1 from one of the corners. An effective new-subject or breaking transition. Can also be used to create a “shuffle” effect with a sequence of same subject videos.

## Video Animator

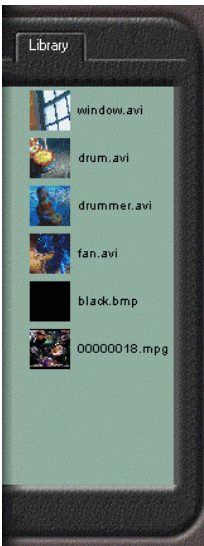


Blend one clip over another, or remove the background color of the foreground clip for interesting effects.

### Image Blend

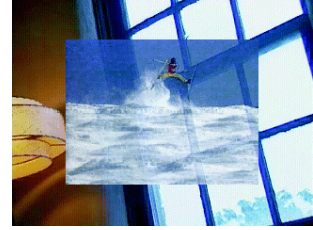
Image Blend lets you choose one clip as the foreground and overlay it onto a background clip. You can set the transparency of the foreground clip, its size relative to the background clip, the length of time it remains visible, and the direction it moves on and off the screen.

Click on the Library tab to access the Start / Hold / Finish Video Animator Preset clip direction. Double-click on the preferred preset direction to apply.



1. While in Video Animator mode, select a clip in the Media Library or the Storyline. This will be your background clip, which will be displayed in the small Background window below the Viewsreen.
2. Select a foreground clip by dragging it from the Media Library to the Viewsreen (or, drag the clip directly to the small Foreground window below the Viewsreen). This clip will then be displayed in the small Foreground window below the Viewsreen.
3. Next, you can specify the directions in which the foreground clip will move onto and off of the screen by setting the *Start*, *Hold*, and *Finish* values. You can choose one of the preset default values found in the Library (to the left of the Viewsreen), if you prefer. Each direction has a preset value for *Start*, *Hold*, and *Finish*, that is, the time spent entering the screen, the time spent stationary, and the time spent leaving the screen. To select a preset direction, double-click the preferred direction.
4. When you are satisfied with the effect, click *Apply*.





*Above left: clip used as foreground. Middle: clip used for background. Right: the completed video animator overlay clip. Note that the foreground was set to semi-transparent.*

### Start / Hold / Finish Video Animator Position



You can also customize the values. If you want the foreground clip to appear and leave the screen from a different area or duration than that of the preset values, you can set your own values. To customize the video animation, you must enter settings for each stage: *Start*, *Hold*, and *Finish*.

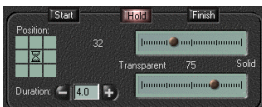
#### Start:

1. Click the *Start* button. In the *Position* box (the small grid of squares), choose the direction from which you would like the foreground clip to enter the screen.
2. Move the Time Slider to the point in the background clip at which you would like the foreground clip to enter the screen.
3. Adjust the Size and Transparency of the foreground clip using the sliders.
4. Click the *Mark Start* button.

#### Hold:

1. Click the *Hold* button. In the *Position* box, choose the area of the screen where you would like the foreground clip to hold position.
2. Adjust the Time Slider to the point at which you would like the foreground clip to begin holding its position.
3. In the *Duration* field, specify the amount of time (in seconds) that the foreground clip is to remain stationary on the screen.
4. Adjust the Size and Transparency of the foreground clip using the sliders.
5. Click the *Mark Hold* button.

#### Finish:



**Tip** - You can have different scale and transparency values for the foreground clip at each stage of the Video Animator sequence, Start, Hold, and Finish.

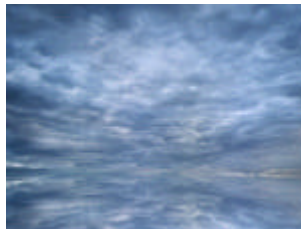
1. Click the *Finish* button. In the *Position* box, choose the direction in which you would like the foreground clip to leave the screen.
2. Move the Time Slider to the point in the clip at which you would like the foreground clip to leave the screen.
3. Adjust the Size and Transparency of the foreground clip using the sliders.
4. Click the *Mark Finish* button.

You can activate the audio for either of the clips by clicking the FG (Foreground) or BG (Background) check boxes. This is a useful option, especially if one clip has background music while the other has narration.

Select *Apply* to have all the Video Animator values entered into your clip.

### **Remove Color**

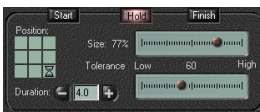
Click this check box to remove a selected color from the foreground clip, so that the background clip shows through. This is a special effects technique you may have seen on television, most commonly done by TV weather reports where a map is seen behind the weather reporter. The effect is best achieved when the subject of the foreground clip is in front of a solid color (as seen below), but interesting results can be obtained with virtually any video. Experimentation is encouraged.



*Above left: clip used as foreground. Middle: clip used for background. Right: the completed clip with the color blue removed shows the subject over the background. The Tolerance (color sensitivity) was adjusted to obtain the best effect.*

**Start:**

1. Click the *Start* button. In the *Position* box (the small grid of squares) choose the direction from which you would like the foreground clip to enter the screen.
2. Move the Time Slider to the point in the background clip at which you would like the foreground clip to enter the screen.
3. Choose the color you would like to remove from the foreground clip.
4. Adjust the Size of the foreground clip and Tolerance (for fine adjustment of the color removed) using the sliders.
5. Click the *Mark Start* button.

**Hold:**

1. Click the *Hold* button. In the *Position* box, choose the area of the screen you would like the foreground clip to hold position.
2. Adjust the Time Slider to the point at which you would like the foreground clip to begin holding its position.
3. In the duration field, specify the amount of time (in seconds) that the foreground clip is to remain stationary on the screen.
4. Adjust the Size and Tolerance of the foreground clip using the sliders.
5. Click the *Mark Hold* button.

**Finish:**

1. Click the *Finish* button. In the *Position* box, choose the direction in which you would like the foreground clip to leave the screen.
2. Move the Time Slider to the point in the clip at which you would like the foreground clip to leave the screen.
3. Adjust the Size and Tolerance of the foreground clip using the sliders.
4. Click the *Mark Finish* button.

**Tip** - You can have different scale and tolerance values for the foreground clip at each stage of the Video Animator sequence, Start, Hold, and Finish.

You can activate the audio for either of the clips by clicking the FG (Foreground) or BG (Background) check boxes.

Select *Apply* to have all the Video Animator values entered into your clip.

## Using the Clipboard

The Clipboard is a useful tool for saving time in the production of your video. You can cut or copy clips or transitions to rearrange the clip order, or copy video clips, images, sound files or transitions to another Storyline.



**To Copy** an object to the Clipboard without removing it from its present location, highlight it, and then click the Copy icon.



**To Cut** an object from its present location to the Clipboard, highlight it and then click the Cut icon.



**To Paste** an object from the Clipboard to another location, highlight the destination on the Storyline, and then click the Paste icon.

## Things to Consider Before Saving your Video Production

Video files consume large amounts of disk space, and can therefore be difficult to store, manipulate, and distribute.

Video compression reduces the size of these files to manageable levels by encoding the video frame data. When the encoded frames are required for playback or editing, they are decoded (decompressed) back into their original form.

Compression can also improve playback. Computers are limited by their data rate – how fast they can transfer data from the disk to memory and display. If a video file requires a higher data rate than the computer can provide, it will not play back properly. It may appear jumpy and skip frames, and audio may also suffer. Compression reduces the video file's data rate, which improves playback quality.

Other factors that also affect the data rate are *frame size*, *frame rate*, and *audio format*.

### Lossy and Lossless Compressors

*Lossless* compressors recreate the exact same image after decompression – they do not modify the content of the original image. The disadvantage of this type of compression is that the compression rate is typically only 2:1. This restricts the use of this method of compression to applications with lower amounts of data, such as still images.

*Lossy* compression reaches a much higher ratio of compression, often up to 25:1, albeit at the cost of altering the image slightly. With better methods of compression this alteration is carefully chosen to be invisible to the human eye.

**Frame Size** – Studio-quality frame size for digital video is 720 x 480 (NTSC) or 720 x 576 (PAL/SECAM). But when using consumer equipment, the horizontal sample rate can be reduced, resulting in a frame size of 320 x 480 (NTSC) or 384 x 576 (PAL/SECAM). This frame size still contains both fields of the interlaced video signal, making it suitable for tape to tape edit. When the goal is to create video for playback on the computer screen, non-interlaced capture should be used. This is best achieved by capturing just one of two fields, resulting in a frame size of 320 x 240 (NTSC) or 384 x 288 (PAL/SECAM). This frame size is roughly equivalent to that found in standard VHS VCR recordings.

For Internet use, the standard frame size is 160 x 120. This size reduces memory requirements and download times over phone lines.

**Frame Rate** – Frames per second (fps). The standard for TV is 29.97 fps (NTSC) or 25 fps (PAL, SECAM). For tape to tape edit this exact number must be used. For other media, like CDs and Internet, 15 fps is usually acceptable and requires less storage space.

#### **Audio Format**

- Sound sampled at a frequency of 22kHz is twice the size of the same sound sampled at 11kHz. Music is usually better sampled at a higher frequency; speech suffers little when it's sampled at 11 kHz.
- Audio sample size (in bits) affects the audio's dynamic range and signal-to-noise ratio. 16-bit sample size is equivalent to that used in CD playback, and is preferred for music; 8-bit is fine for dialogue.
- Stereo audio takes up twice the storage room of monaural audio. If your audio track is stereo and consists mainly of dialogue (rather than music), consider changing it to mono.

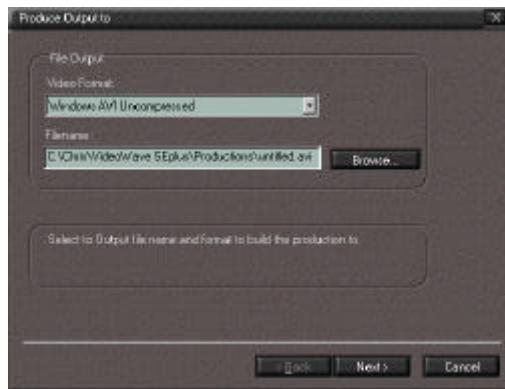
## Producing your Video



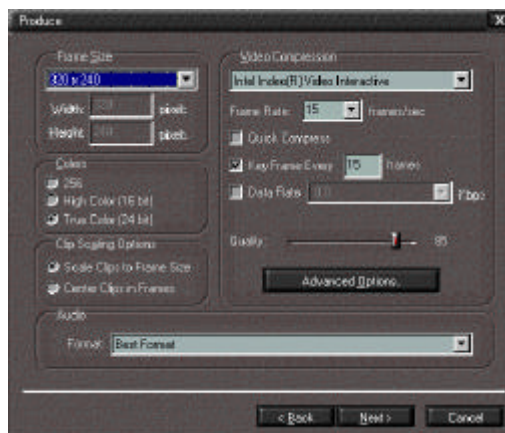
To save your Storyline as a work in progress, click the **Save** icon. This will save your Storyline as an MGI VideoWave .SBD file that you can later re-open to continue your editing.



To Save your Storyline as a final production, click the **Produce Video** icon. The Produce Output To dialog will appear, allowing you to save your video production as an Audio Video Interleave (.AVI) or MPEG (.MPG) file. You can type a name for your production and browse your hard drive for the directory you want to save to.



After naming your production, click *Next*. The Produce dialog is displayed, containing a number of options that allow you to specify the frame size and rate, the number of colors, and the type of compression.

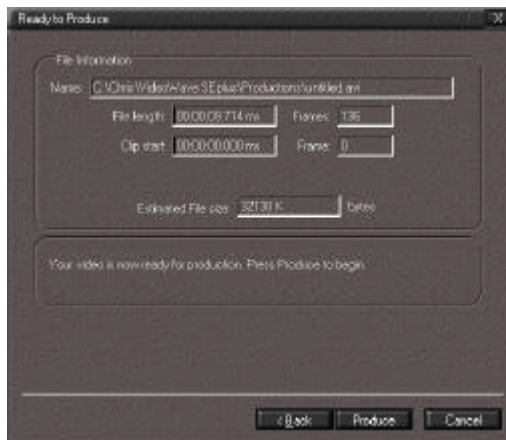


Because video files can be quite large, MGI VideoWave allows you to compress the file as part of the “Produce Video” process. This significantly reduces the size of the file when compared to uncompressed video.

When in the *Production Goals* dialog, (From the *Start* menu, click “Options” then “Production Goals”) you can specify the appropriate medium that your final production is designed for (Tape, Internet, or CD), and the desired quality setting (Premium, Good, or Basic). Based on these settings, MGI VideoWave will automatically apply the most appropriate compression values, which will be applied when you save the production.

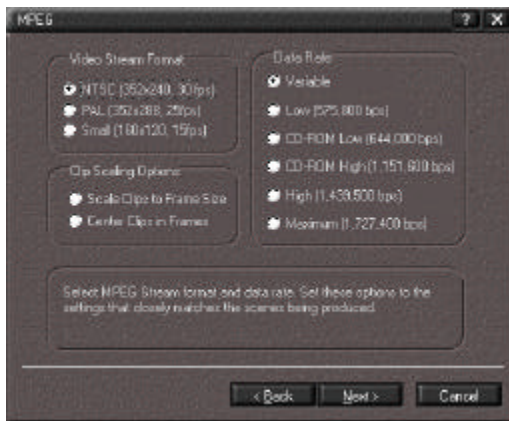
Clicking “Advanced Options” in the *Produce* dialog will present the Compression Options window, where you can specify detailed compression options. The appearance of this dialog and the options available will depend on the type of compression software installed on your computer, and the settings entered in the Production Goal dialog. Normally, it is not necessary to change the compression settings, as MGI VideoWave’s default compression values are designed to accommodate a wide variety of video applications.

Clicking *Next* again will prompt the following dialog, which contains information on file size and number of frames:





Selecting MPEG as your final production file will prompt the following dialog:



The MGI MPEG Encoder uses MPEG compression technology to encode streams of major file formats including .TGA, .AVI, .GIF, .JPG, .PCX, .TIF and others.

MPEG is an acronym for Motion Pictures Experts Group. MPEG is a group of people that meet under ISO (the International Standards Organization) to generate standards for digital video (sequences of images in time) and audio compression. In particular, they define a compressed bit stream, which in turn defines a de-compressor. The MPEG-1 standard defines a bit stream for compressed video and audio optimized to fit into a bandwidth (data rate) of 1.5 Megabits per second (Mbits/s). This rate is special because it is the data rate of uncompressed audio CDs. The standard is in three parts, video, audio, and systems, where the last part gives the integration of the audio and video streams with the proper time stamping to allow synchronization of the two. MPEG-2 defines a bit stream for video and audio coded at around 3 to 10 Mbits/s.

## How MPEG Works

MPEG starts off with a relatively low resolution video sequence of about 352 by 240 frames by 30 frames/sec (in North America), with original, high (CD) quality audio. The images are in color, but converted to YUV space. The two chrominance channels (U and V) are decimated (broken down) further to 176 by 120 pixels.

It turns out that you can get away with a lot less resolution in those channels and not notice it, at least in "natural" (not computer generated) images. The basic scheme is to predict motion from frame to frame in the temporal direction (the direction you would logically expect to go), and then use a mathematical formula to organize the similar areas (called redundancies) in each successive frame of the images. Basically, MPEG predicts each succeeding frame based on information from the ones that have already gone by.

## MPEG Audio Encoding

Audio input is broken up into a small set of samples representing a short period of time called a frame. The MPEG audio standard also divides the audio input into 32 sub-bands. These sub-bands together represent the entire perceptible auditory spectrum. The sub-band representation of the audio signal requires as much space to store as the original .WAV file.

Audio compression is achieved by not storing a sub-band if it is void of content. Also, the number of bits that represent a sub-band is reduced, and hence the quality of the information of the sub-band. The audio compression part of MPEG uses very carefully developed psycho-acoustic models derived from experiments with the best obtainable listeners to pick out pieces of the sound that you can't hear.

There exists what are called "masking" effects where, for example, a large component at one frequency will prevent you from hearing lower energy parts at nearby frequencies, where the relative energy vs. frequency that is masked, is described by some empirical curve. There are similar temporal masking effects, as well as some more complicated interactions where a temporal effect can unmask a frequency. To compress audio, MPEG tries to remove the irrelevant and redundant parts of the signal.

# *Audio Production*





## E. Audio Production

### Audio Studio



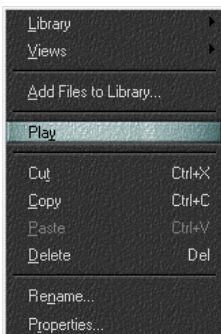
Using the MGI VideoWave **Audio Studio**, you can edit and play digital audio files, and import and save .WAV files.



To add one or two sound files to your video clip, drag the sound files from the Media Library to the *Audio Track* window.

Up to three audio tracks can be assigned to your video file: the original track that was recorded with the video, and two tracks that you can add to the video. If the original video was recorded without sound, you can add two audio tracks to it.

The duration of the clip is shown in the Preview/Edit Control Panel (below the VCR-type buttons).



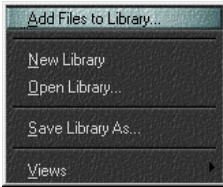
### Playing Audio Clips Directly from the Media Library

You can listen to the audio clip while it is on the Media Library without having to drag it to the Audio Track window. Right-click the audio file you wish to listen to, and from the menu displayed, select “Play.” When the clip is playing, the menu item will change to “Stop,” giving you the opportunity to stop the playing of the audio file.

## Adding Sound to your Video Clip



1. Click the Audio Studio button to present the Audio Studio interface.
2. Right-click the Media Library, and from the menu displayed choose “Add Files to Library...”. Browse the file selector for the video and audio clips you want, and click OK.
3. Drag the video clip to the Storyline. It will appear in the Viewscreen.
4. Drag the sound clip from the Media Library to the Audio Track window. The selected sound clip's duration will be shown in the Preview/Edit Control Panel.



You can preview the sound of the clip by selecting it and then clicking the *Play* button in the Preview/Edit Control Panel.

Audio clips will play as you move the slider with the mouse, a feature that can aid you in finding the section of audio you may be looking for. Because the slider is being moved faster with the mouse than if you had pressed play, the audio will sound “clipped,” or similar to the sound resulting from the fast-forward function in a home CD player.



*In /  
Out  
Points*

If the audio clip is longer than you need, you can set the duration of the audio to match the length of your video clip, by setting the In/Out points of the audio clip. Drag the slider to the point you want the audio to start, then click the *Mark In Point* button. This will be the start point of your audio clip. To set the end point of your clip, drag the slider to the desired point, and click the *Mark Out Point* button.

You can reset the points to their original positions by holding down the [Shift] key while clicking the *Mark Point* buttons.

The *Fade In* check box will smoothly increase the volume of the sound clip from zero to full volume when the clip begins to play. The *Fade Out* check box will smoothly decrease the volume of the clip to zero when the end of the clip approaches.

If the audio clip is too short for your video clip, click *Repeat*. This will repeat your audio clip as many times as necessary to match the selected video clip.

You can also [Shift] select all the audio clips in the Audio Track window to apply volume, fades, or mutes across all audio clips at the same time.

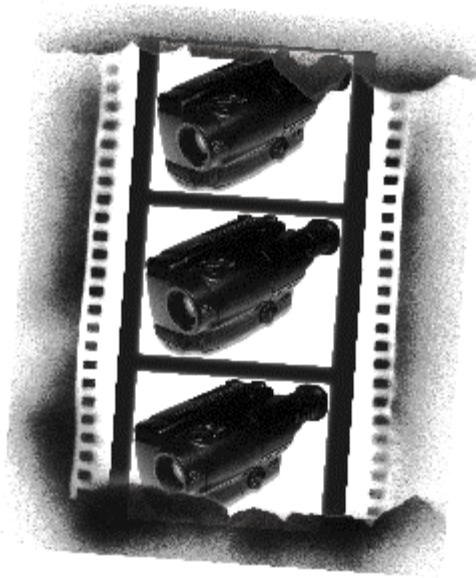
5. Click *Apply* to have the audio tracks and volume effects added to your clip.

If you would like to remove the original audio track, click the *Mute* button before saving the video.





# *Video Capture*





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## F. Video Capture

### Introduction

MGI VideoWave video/audio capture and editing software transforms analog video into digitized .AVI files (Video for Windows) that you can play back on your computer. The resolution and frame rate will depend on the capabilities of your capture hardware.

*If you intend to remove or change your capture card, MGI recommends that you also remove the capture drivers from your hard drive. If the drivers are present without a capture card installed, MGI VideoWave may not operate properly.*

Using MGI VideoWave, you can capture video with audio. Using your PC and a PC-controllable video source (VCR, laserdisc player), you can use the Windows™ MCI device controller to capture video with frame accuracy (MCI stands for Media Control Interface, Microsoft's platform-independent multimedia specification providing a consistent way to control devices such as CD-ROMs and video playback units).

Use MGI VideoWave to capture and edit video from a video camera, television, VCR, or laserdisc player. Used with a sound card, the capture software provides CD-quality sound with sampling rates of up to 44kHz. Depending on the audio hardware, you can capture audio at 11kHz, 22kHz, or 44kHz, in 8-bit or 16-bit mono or stereo. MGI VideoWave also offers a full range of video and audio editing features, allowing you to play back captured video from your hard disk, or view live video before capturing.

### MGI VideoWave Capture Features

- **Motion video and audio capture**
- **Still image capture**
- **Live video monitoring** – allows you to preview video before capturing
- **Automatic No-Recompression option** – maintains image quality of captured video

MGI VideoWave captures video, audio, or both together. You can preview the incoming video to select frames for capture, and adjust video quality or resolution before capturing. This chapter explains how to capture full-motion video, single video frames, and audio. MGI VideoWave provides three ways to capture:

### **Record**

Capture a stream of full-motion video and audio, and save it to an .AVI file.

### **Single-Frame Capture**

Capture single frames in image-type formats (.GIF, .TIF, etc.).

### **Sequence**

Allows you to capture a sequence of frames.

### **MCI Capture**

Capture video from an MCI-controlled device.

### **Video and audio editing capabilities**

- MCI Device Control – lets you control MCI-compliant video sources for improved capturing.

### **Video Tips**

In many cases, you can use MGI VideoWave's default capture settings for much of your work. But if you want to get the most out of digital video, here are a few techniques and hints for creating, manipulating, and displaying your files.

### **How We See Things**

People perceive the visual world in the following sequence:

- first, we see motion
- then brightness
- then color
- then resolution

## Capturing Audio

Capture is the step where options matter most. Audio capture, in particular, can needlessly eat up lots of disk space.

- Stereo audio takes up twice the storage space as monaural audio. If your audio track is stereo and consists mainly of dialogue (rather than music), consider changing it to mono.
- Sound sampled at a frequency of 22kHz consumes twice the storage space as the same sound sampled at 11kHz. Music is usually better sampled at a higher frequency; speech suffers little when it's sampled at 11 kHz.
- Audio sample size (in bits) affects the audio's dynamic range and signal-to-noise ratio. 16-bit sample size is equivalent to that used in CD playback, and is preferred for music; 8-bit is fine for dialogue. Keep in mind that good quality audio depends on the source – poor microphones or a dirty tape playback head can produce disappointing results. Audio can have a large impact, so if it's important to your video, you may want to use the 16-bit setting to maintain fidelity and minimize noise, while ensuring the capture source is providing the highest possible performance.

## Capturing Video

The person receiving your file may have software-only playback, in a smaller window.

- If you capture in a larger window size that is later reduced, your file may exhibit "jaggies" ("stair-step" effects on diagonal lines). For most desktop PC presentations, quarter-screen (320 x 240) is the best size.

## Compression

A key frame is a single video frame that contains much of the image information of subsequent frames, and is therefore used as a reference to compressing following video frames. In other words, a keyframe contains enough redundant information to produce a copy of itself for the next few frames instead of having to read new information for all frames, saving data and disk space. The key frame is the baseline against which MGI VideoWave compares other frames for differences. The Key Frame option specifies the rate at which the clip is sampled for key frames.

- Generally, set the Key Frame option to match the playback rate of the clip. For example, if you have set the frame rate of your clip to 15 frames per second (fps), set the Key Frame option to 15.
- Key Frame provides increased compression and playback speed, but it can slow access to individual frames in the clip. If you want to view the clip without skipping to different parts, set the Key Frame option higher than the frame rate.

## Data Rate

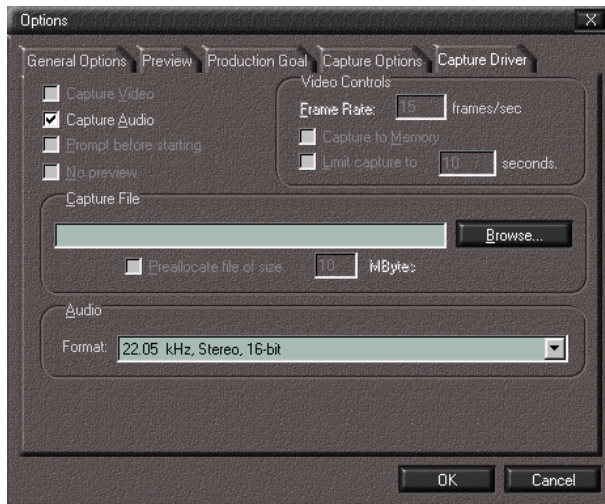
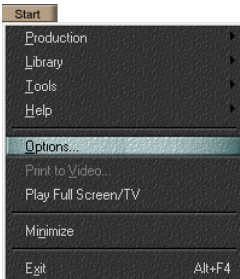
The data rate is the speed, in kilobytes per second (Kbps), at which the playback computer can transfer data from disk to screen.

- Use this option to specify the anticipated data transfer rate of the playback computer system.
- You'll get the best results if you don't select this option when you are editing.
- When producing a file for print to tape, set the Data Rate to the same value used during capture, and set Quality to 100%.

## Capture Options

In preparing to capture video and audio, it is first necessary to set the proper options.

From the Start menu, click Options. This will present the **Options** dialog from which you can set the frame rate, length and size of capture, the audio format, and other parameters. Click *Capture Driver*.



The time limit is useful if you know precisely how long your audio or video capture needs to be. For example, you would need 30 seconds of music to accompany a 30 second commercial.

### Audio Format

Use the Audio Format setting to specify the sampling frequency and sample size. Generally:

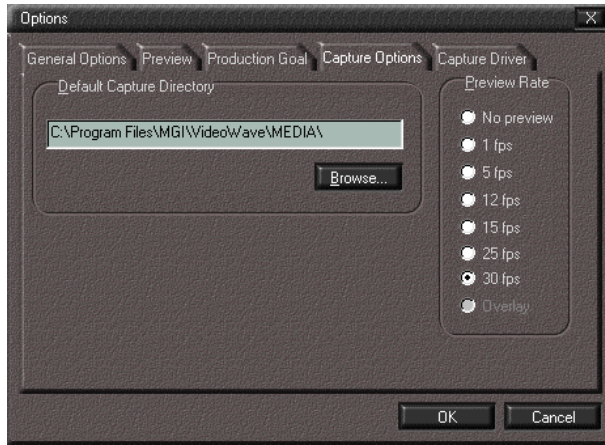
- increase to improve fidelity
- decrease to reduce the file size

### Video Source

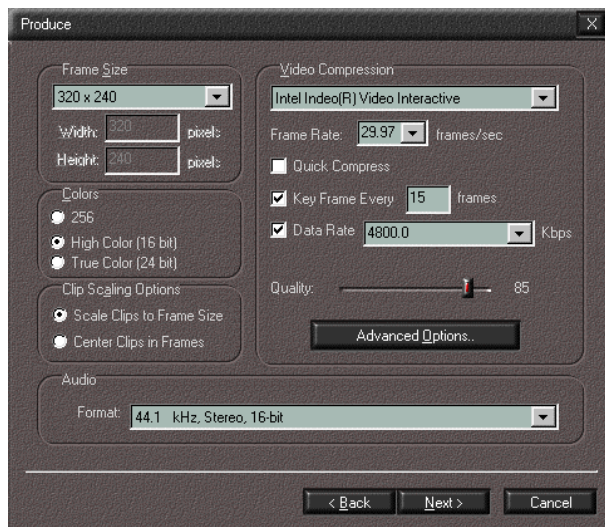
If your capture board supports different signal types, and North American and European video, you can select the appropriate video sources. The documentation supplied with your hardware will explain these options.

The **Capture Options** dialog contains several settings for Preview Rate.

*No Preview* will not show a capture preview in the Viewscreen. *Overlay* will show a preview in real time, as it is played in your source device.



The *Produce* dialog contains settings which will be applied to your saved production. You can set the frame size, frame rate, color depth, and the compression options. Normally, you would not need to modify the settings, as they are set automatically in the Options: *Production Goal* dialog.

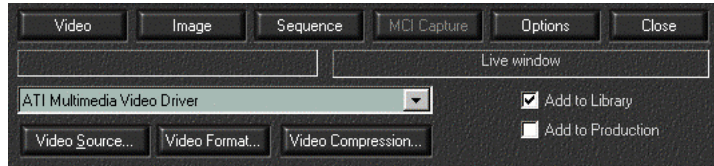




## Capture Interface



MGI VideoWave's capture interface is opened by clicking the Capture button in the Video Mode Selector:



To begin capture, click the *Video*, *Image* or *Sequence* buttons.

**Video** captures video, with or without audio, as set in the Options: *Capture Driver* dialog.

**Image** captures a still image from the video source.

- Audio is not captured with still frames.

**Sequence** allows you to capture a sequence of frames.

- You can't capture fewer than two frames.

**Video Source** opens a dialog for you to adjust brightness, contrast, etc.

**Video Format** lets you set a frame size for your captured file. Larger frame sizes create more video data and may cause more frames to be dropped during capture.

The dialog which appears controls the image dimensions and, if present, the onboard video compression used for video capture.

**Video Compression** will present a dialog in which diverse compression options can be selected:

This is used for capture boards without onboard compression hardware. Select the preferred method and quality for compressing the raw video data before it is written to the hard disk.

The appearance of this dialog and the options available will depend on the type of compression software installed on your computer, and the settings entered in the *Production Goal* dialog. Normally, it is not necessary to change the compression settings, as MGI VideoWave's

default compression values are designed to accommodate a wide variety of video applications

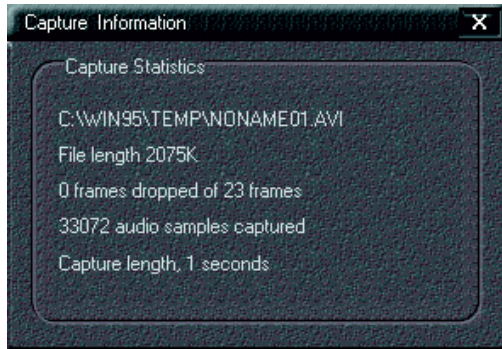
**MCI Capture** – MCI stands for Media Control Interface - the interface used to communicate with devices such as VCRs and laserdisc players. If you do a lot of video capture, an MCI VCR-compliant video device can speak directly to Windows™ through your computer's serial port.

Using an MCI-compliant device, you can specify the exact start and end time on your tape or Laserdisc, and MGI VideoWave will capture only the frames within that time period.

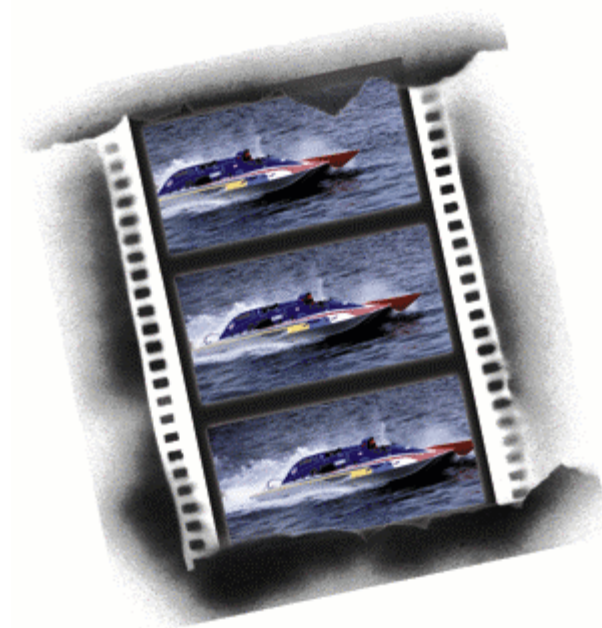


Click the Record button to capture. To end capture, press the space bar.

When you are finished capturing, the *Capture information* will appear with general capture information.



# *Working with Video*





## G. Working with Video

### Video Publishing Primer

By following the tutorial and tips in this manual, and with a little practice, you can be producing your own videos in a matter of hours.

### Your Camcorder

If you don't have much experience using your camcorder, this section can help you. Knowing how your camcorder works, and how to make any necessary adjustments are essential to obtaining good results while shooting video.

#### White Balance

If, when you play back tapes recorded from your camcorder you notice that the picture has a colored tinge (bluish, greenish, reddish), you may need to adjust the camcorder's white balance. White balance should be set at the beginning of every recording session, and whenever you change locations if the lighting conditions differ during the same session.

White Balance is the control that adjusts the camcorder's color sensitivity to match the prevailing color of the light in the shooting environment. This can be whiter outdoor light, yellower indoor light, or greenish fluorescent light. On most camcorders, white balance may be set either automatically or manually. On some cameras, you can set white balance to closely match the exact light in which you're shooting. White balance may be set "incorrectly" on purpose to achieve special effects. Shooting indoors with the outdoor setting can achieve a romantic, "candle light" orange cast. Shooting outdoors with the indoor setting produces bluish "moonlight" results.

To adjust the white balance, put the camcorder in record and pause mode; then point it at a blank, white object that fills the frame (like a wall or a sheet of paper), and push the button marked White Balance. If your camcorder has no such button, it will perform this adjustment automatically if you follow the same steps.

*Outdoor (natural) white balance* is the camcorder's color sensitivity setting that matches the whiter ("cooler") cast of natural daylight. This is an average outdoor setting, because natural light can vary from warm direct sunshine to cooler open shade to very cool high

overcast.

Ordinary household light bulbs use the *Indoor* (incandescent) *white balance* setting. It is the camcorder's color sensitivity setting that matches the warmer cast of Tungsten-halogen lights (so-called "Quartz" movie lights, work lights, and low-voltage track lights).

*Fluorescent white balance* is the camcorder's color sensitivity setting that approximates the slightly greenish cast of cool fluorescent light. Some camcorders lack a fluorescent light setting. If your camcorder does not have this setting, set white balance for outdoors when shooting in fluorescent light. Even with a fluorescent light setting, results may be less than ideal, since unlike natural and incandescent light, fluorescent light does not contain all the colors of the visible spectrum.

*Auto white balance* instructs the camcorder to analyze the color cast of the incoming light and set itself for the most appropriate results. On less expensive units, it chooses between preset outdoor and indoor settings. On more fuller-featured camcorders, auto white balance fine-tunes itself continuously to adjust to changing light color.

*Manual white balance* lets you select the overall color you prefer. It is preferable to auto white balance in some situations. Auto white balance control will sometimes produce unpleasant results when shooting in cool fluorescent light. To prevent this, manually set white balance to outdoors. When shooting outdoors, you can achieve a bluish moonlit night look by setting the manual white balance to indoors and underexposing just slightly. When shooting indoors, you can produce a warm candle light or fire light effect by setting the manual white balance to outdoors.

### **The Iris**

The iris regulates how much light passes through to the image-capturing portion of the camcorder. Just like the iris in your eye, the iris in a camcorder lens opens and closes to allow more or less light in. The size of this opening, together with the focal length, determines the "aperture," or light gathering ability, of the lens. Along with the shutter, the iris is the principal component in the camcorder's exposure control system. Just as with a conventional still camera and film, a good quality image is only obtained when the camcorder's sensor is struck by exactly the right amount of light. Because video is shot in widely varying light levels, from candle-lit dining rooms to high-noon outdoor scenes, the exposure control

system is designed to create a good image in relatively low light, to accommodate this range. As the light grows brighter, the lens' iris gradually closes, so that the amount of light reaching the chip remains the same. In all camcorders, the iris can be controlled automatically by the camera's light-sensing circuitry. High-end cameras also have manual control.

### **Exposure**

*Auto exposure* is a setting that automatically adjusts the opening in the lens' iris diaphragm to regulate the amount of light admitted to the camcorder. These systems work well in general, but they can be “fooled” by some lighting conditions.

*Manual exposure* is a setting that allows the user to adjust the amount of light reaching the image-forming sensor. This is useful in compensating for difficult lighting conditions, such as excessive back light. Some controls can close the iris diaphragm completely, producing a “fade out” effect. Manual iris control is best used sparingly, as even slight changes can dramatically affect exposure.

### **Backlight Compensation**

A camcorder control that can improve exposure when dark subjects are shot against brighter backgrounds, such as a sunset or ocean view. Some camcorders have a special backlight compensation feature which will adjust the exposure if, for example, the subject is standing in front of a bright window. If this feature is left off, the subject will appear very dark.

Simple back light controls increase exposure by a preset amount. More sophisticated versions can be fine-tuned manually, with the effect shown in the viewfinder. While it is preferable to shoot with the light source behind or to the side of you, this feature is useful if the backlight conditions are beyond your control.

## Shutter

The shutter is an electronic device that controls the amount of time during which incoming light forms a single video field (each video image, or “frame” consists of two fields). Since video is recorded at 60 fields per second (in the North American NTSC system – 50 fields in European PAL and SECAM), the normal camcorder shutter speed is 1/60 sec. The word “shutter” is actually a metaphor borrowed from the realm of film, where still and movie cameras control exposure time by means of mechanical shutters. Because video cameras lack physical shutters, they control exposure length by adjusting the amount of time during which the sensor is allowed to accumulate a charge, before dumping it and starting another video field.

*High shutter speeds* are designed to improve image quality, sharpen images, or restrict lens focus. Where normal shutter speed is 1/60 sec., higher speeds usually start at 1/250 sec. and range up to 1/12,000 sec., depending on the camcorder. High shutter speeds are most commonly used to “freeze” motion in individual video frames, so that action shots that would otherwise be blurred (such as sports) can be more easily seen and analyzed. However, excessively high shutter speed can produce an unpleasant stroboscopic or oscillating effect.

*Low shutter speed(s)* are designed to capture images in extremely low light, or to create “blurred” special effects. Where normal shutter speed is 1/60 sec., low shutter speeds may be half that or less. Low shutter speeds are not widely found on consumer cameras, because low-light shooting is more often enabled by amplifying the signal, and the smear effect can be added later in editing by effects generators.

*Programmed iris/shutter* is a control that adjusts both the iris diaphragm and the shutter speed together, to optimize image quality in different shooting conditions. On some camcorders these combined settings can be set manually, to achieve a longer than normal depth of field, for example. However, The programmed version, allows the videomaker to save time by obtaining different effects without worrying about the individual settings.

*Outdoor programmed setting* is a setting in which the shutter speed is moderately increased in order to reduce the time incoming light strikes the image forming chip. In very bright conditions, too much light can enter, even when the iris at its smallest setting. The result



can be smeary colors. The outdoor setting will usually correct this problem.

*Sports programmed setting* is an iris/shutter combination in which the shutter speed is substantially increased and the iris opening is widened to compensate. The higher shutter speed freezes the movement in individual frames, so that sports scenes (racing cars, golf swings) may be clearly seen.

*Portrait programmed setting* is an iris/shutter combination in which the iris is substantially widened and the shutter speed is increased to compensate. This creates a short depth of field, keeping the distracting background out of focus while the subject is in focus. This is especially useful for outdoor portrait shots or other close-ups.

### **Lens**

The Lens is the camcorder's image collecting system. As in a regular still camera, it serves to gather the light reflected from camera subjects and focus it as a coherent image on a single plane – the plane where the camcorder's image-sensing chip turns it into an electronic signal. Most, but not all consumer camcorders are fitted with zoom lenses, whose rendering of the image size and perspective can be varied over a broad range, from wide angle to telephoto.

*Lens zoom range* is the variation in image magnification that a camcorder lens provides. All consumer camcorder zoom lenses vary from wide angle at one extreme to telephoto at the other (you “zoom in” to telephoto and “zoom out” to wide angle). At wide angle settings apparent depth is increased and the angle of view can be quite expansive. At telephoto settings, the angle of view is narrow and apparent depth is reduced. Distant objects look larger and movement toward or away from the camera is minimized.

*Motorized zoom lenses* are activated by a servomotor, controlled by the user with the camcorder's zoom buttons or rocker switch. Motorized zoom has the advantage of extreme smoothness and regularity. On the down side, the motor consumes battery power rapidly, and the zooming speed is too slow for some applications. Some more expensive camcorders may have multi-speed zoom motors.

A *manual zoom lens* is activated by the user, usually through a ring around the lens, equipped with a short handle. While all camcorder zooms are motorized, only a few models include manual zoom, even though this feature is essential for sophisticated zoom control. Advantages include the ability to adjust very quickly to focus on a new subject or create a new composition, and extended battery life, as no power is used.

### **Focus**

Focus is the adjustment of the lens to keep the image sharp in appearance, and includes some of the foreground and background. The area between the foreground and background that remains in focus is called the “depth of field.” Depth of field is affected by three factors: focal distance, lens focal length, and lens aperture (opening). The greater the distance, the wider the lens angle, and the smaller the aperture, the deeper the depth of field. Conversely, a closer distance, zooming in and using a larger aperture will shorten the depth of field. Focused at infinity in bright sunlight, a camcorder lens at wide angle may be in focus from the horizon to a few inches in front of the lens. At its closest focus, in low light levels, a telephoto lens may be in focus through only half an inch or less.

*Autofocus* focuses the lens automatically, by determining the distance to the subject in the central portion of the image. Though very convenient for fast shooting, autofocus has some drawbacks. It can be slow to respond; it can have trouble in low light levels; it can shift back and forth, trying to find a subject to focus on; it can change focus when a person or object passes between the subject and the lens; and it can miss-focus when the center of interest is not in the center of the composition.

*Manual focus* lets the user focus the lens where desired. Manual focus requires frequent adjustment by the user, a process that takes some practice. If you want to record a specific scene for any length of time, it is a good idea to disable autofocus, zoom to full telephoto, center and focus on the most important subject, and then zoom back to your original composition. This ensures that the important subject will remain sharp at any zoom setting.

*Macro focus lens setting* is the focus position for very close shooting, such as copying photos or documenting a stamp collection. The macro focus position lets the camcorder come much closer than usual to the subject matter, to fill the frame with smaller objects than would

otherwise be possible. To find your camcorder's closest position, set the lens at the longest focal length at which the macro function will work. Then, move the camera toward the subject until it comes into sharp focus.

### **Image stabilization**

A feature that helps compensate for camera shake. *Electronic stabilization* works through microchip instruction, by recording only a large but incomplete portion of the total image created by the chip. When the camera shakes in one direction, the image portion recorded moves proportionately in the opposite direction, canceling out most of the camera movement. *Mechanical lens stabilization* directs incoming light through a movable prism, thereby moving the image at the lens. When the image moves off the center axis, the front element of the prism tilts to re-center it at the chip.

### **CCD**

A CCD (charge coupled device) is a small silicon wafer that most camcorders use to convert light into a video signal. It consists of many tiny light-sensitive pixels (picture elements) that react to incoming light, changing it into electricity so that it can be recorded on tape or played on a monitor.

### **Record/playback**

*Record/Playback* is a pair of functions intended for use when the camcorder is functioning as a camera (separate record and play controls are provided for the VCR function).

*Record* is the control that enables the camcorder's record function. Pressing it once begins recording, pressing it again stops recording.

*Record/review* (or other similar name) allows you to view in the camcorder's viewfinder what you've just shot, to see if you need to re-shoot. This is useful if you are producing a scripted video, where more than one take may be necessary. One problem with this control is that it can leave the tape with previously recorded material at the start point.

*Record indicator light* is a tiny red light on the front of the camcorder that tells your subjects that they are being recorded. The light may intimidate some people, so you may want to tape over it if your camcorder doesn't let you switch it off.

*Standby* is a battery saving feature on some camcorders. If record is not enabled within a few minutes, the standby function powers down all camera activities. Pressing record again reactivates the system.

*Power on* is the camcorder's main on/off switch. As long as the camera is on, it is ready to begin recording very quickly because the tape is fully threaded in the tape transport and the viewfinder displays an image. While on, the camera consumes battery power, so it's usually a good idea to leave it off until a few minutes prior to actual recording.

### **Viewfinder**

*Viewfinder* is the display on which you watch the image you are taping. Most viewfinders are tiny video monitors. Many are now color monitors, and some are large LCD screens, mounted externally so you can view them easily without bringing your eye right up to the camera.

*Viewfinder contrast* is a control that adjusts the range between the darkest and lightest areas of the viewfinder image. Too little contrast makes the picture dull and grey; while excessive contrast makes the picture too black and too white, without much grey shading in between.

*Viewfinder brightness* is a control that adjusts the overall brightness of the viewfinder image.

*Viewfinder color* is the set of controls used to adjust color quality on a color viewfinder. Some models have separate controls for tint and color intensity. To adjust a color viewfinder, reduce color intensity to obtain a black and white picture, adjust brightness and contrast, increase color intensity to taste, then adjust the tint control last.

*Viewfinder readouts* are words, numbers, and symbols superimposed over the viewfinder image to inform you of the camcorder's status. Readouts vary tremendously among camcorder models. Typical readouts include battery power remaining, date and time, tape counter, white balance setting, zoom position, and area monitored by the autofocus system. Some readouts appear only when their respective functions are enabled. In some models, all viewfinder readouts can be disabled.

*Viewfinder diopter adjustment* allows videomakers who normally need to wear glasses to shoot without them. The controls are usually a ring around the viewfinder, or a slider below it. To use a diopter adjustment, focus the lens on a distant scene, then adjust the diopter until the viewfinder image looks sharpest.

### **VCR Buttons**

*VCR buttons* control the set of functions that enable a camcorder to work just like a regular VCR. Almost all camcorders will function either as a recording camera or as a VCR, but not both at once. Some models use a switch to toggle between camera and VCR mode; others protect the VCR buttons with a door or slider that incorporates a switch. When the cover's open, the camcorder functions as a VCR; when it's closed, you have a camera.

*VCR record* enables the camcorder to copy from video sources such as cable TV or another VCR.

*VCR play* acts exactly like the play button on a VCR.

*VCR pause* acts exactly like the pause button on a VCR. When editing to the camcorder, begin each edit by pausing the deck at the start point of the new shot, then press record, to place the camcorder in record/pause mode. Press pause again or play to begin actual recording.

*VCR stop* acts exactly like the stop button on a VCR.

*VCR fast forward & reverse* act exactly the same as on a VCR.

*Video insert* allows you to replace a length of picture on your edited tape without disturbing the sound. This feature is not available on those 8mm units whose sound tracks are integrated ("multiplexed") with their video recording. To use video insert, you make an edit as usual, but press this control instead of the record button.

*Audio dub* allows you to replace a length of sound on your edited tape without disturbing the picture. This feature is not available on those 8mm units whose sound tracks are integrated ("multiplexed") with their video recording. To use audio dub you make an edit as usual, but press this control instead of *record*. On stereo VHS format units, you must disable the stereo playback feature, or else you will continue to hear the old sound instead of the new audio dubbed over it.

*Digital video effects (DVEs)* are functions like fades and wipes that are used to make transitions between video sequences or to create special visual effects. Although some camcorders have these features built in, better results can be obtained by editing later. If you add a visual effect to your original camera tape, you cannot change it. But if you do it during the editing process, you can try it several ways, without affecting your original footage.

### **Input/Output Jacks**

*Input/output jacks* are sockets that enable your camcorder to communicate with other components, such as a TV monitor or video capture card on a PC. The control jack, if present, will let you trigger certain VCR functions remotely, to partially automate the editing process. Some camcorders provide both input and output audio/video jacks, so that the camcorder can function as a record deck as well as a source deck.

*Y/C jack* (sometimes called an S-VHS or S-Video connector) carries the video signal in its separate luminance and chrominance components. If your camcorder has one, it will provide better quality video.

*Composite video jack*, usually an RCA-type jack, carries both the luminance and chrominance components of the video picture. It is typically coded yellow.

*Audio jack(s)*. This connector, usually an RCA-type jack, carries the audio signal. If the camcorder has stereo sound, the white-coded jack handles the left channel and the red-coded jack handles the right channel.

*Headphone jack*. This jack enables you to plug in a headset and monitor the quality of your recorded sound.

*External microphone jack*. This jack lets you substitute a stand-alone mic for the camcorder's built-in model. Plugging the mic into this jack automatically disables the internal mike. Since most external microphone jacks are tiny and unreliable miniplugs, it's very important to check sound quality through headphones when using a separate mic.

*AC power/battery recharge jack.* This jack lets you deliver AC power to your camcorder without worrying about your battery running out of charge. In most models, the same line will recharge a battery installed in the camcorder.

**Flying erase head**

The ordinary erase head on a VCR or camcorder mounts directly onto the unit's chassis. It sets all of the magnetic signal on the tape to black, thus eliminating the existing video signal. *Flying Erase heads*, by contrast, are mounted directly onto the spinning drum that holds the video record heads. They always start erasing at the beginning of the frame, eliminating the “rainbow” of colors present between scenes when editing without a flying erase head.

## Video Concepts

In a sense, everyone who watches television is a video expert. With the hundreds of hours per year that the average person watches TV, it follows that they would develop some recognition of what makes a good or bad video. For most of us, the only thing missing is the knowledge of some specific techniques required to assemble a professional looking video.

This section is designed to give you the groundwork necessary for producing your own videos using MGI VideoWave.

There are seven key areas that you should think about before you begin to produce a video. They are:

- **Story**
- **Style**
- **Moving Images**
- **Transitions**
- **Content**
- **Timing**
- **Pace**

### Story

Video is an ideal medium for telling a story. Whether it is a thirty second commercial or a two hour movie, the story is always the most important element. A thirty second commercial usually has enough time to get two or three ideas across effectively. A more complex story can be told in just one, two, or five minutes.

Regardless of its length, a video needs a good script. The process of telling a story with video is always easier if a script has been defined first. A script may be as formal as sitting down at your computer and using a word processor to write a complete story, or as simple as considering how you are going to videotape your daughter's birthday party a few minutes in advance of the celebration. As a very simple example, think of telling the story of the birthday celebration and forgetting to get a clip of the candles being blown out! Advance planning of the story will help avoid such omissions and improve the overall look of your video.



## Style

Once you have a good story to tell, the next important decision to make is how it should be told. This decision will affect all aspects of your production, including the clips you use, pacing, transitions, timing, etc. For example, if you are producing a video on an important health issue, you would not use the same pace, style, and timing as you would for a new kid's breakfast cereal.

An important point to remember here is that the style you choose will set the mood of the video. Going back to the birthday party example, you would want bright pictures, bright colors, and lots of happy smiling people to create a good mood. All aspects of your video production can contribute to this mood in one way or another. You can shoot bright looking video, lots of different angles, and lots of closeups of people having fun. When you edit you can use bright colors for titles, use shorter clips with quick transitions, add a few fun special effects, and you will have successfully conveyed the mood of the party to the viewer.

## Moving Images

Unlike photographs, video allows you to show life in action. Effective commercials and movies incorporate moving people and objects. With MGI VideoWave, you can showcase moving objects or make static images dynamic by using a number of different effects.

To create videos with impact, you will want to put as much action in your videos as possible. The key to using movement is simple: whenever possible, tell your story with actions, not words.

For example, there will be times when you simply must use a video clip of a “talking head.” This is any video that simply shows someone talking, usually from the shoulders up. To make the person's presentation more effective, add an interesting background, make sure they are passionate about the subject, and if you can, use video effects to help illustrate what they are talking about.

Another important aspect here is movement within the frame. A subject can move from left to right, top to bottom, or diagonally. Use such motion to add interest – but be careful not to overdo it. Finally, movement is not the answer for every video clip. You may want to emphasize something by allowing it to remain perfectly still.

## Transitions

A video production is made up of several video clips. In some cases you will not want to have a transition between clips, while in other situations you will want to add a transition. Transitions are the editing tools that help you tell a story with video, and include such effects as wipes, dissolves and fades.

MGI VideoWave makes it very easy to add transitions to your video productions.

There are four major types of transitions:

- same subject
- new subject
- breaking
- passage of time

You should use different kinds of wipes and fades for each type of transition in your video.

The *same subject* transition occurs when you have two clips that are very closely related. For example, the first clip might show a complete picture of a product, while the next clip shows a closeup of a particular part of the product. Generally, you should use cuts (where there is just an instantaneous change from one shot to another). Cuts are the easiest transitions to create, and are also the quickest way to get from one shot to another.

A quick fade would also work well in this situation. A fade gradually blends one video image into another by slowly reducing the intensity of the image as the background fades in, or vice versa.

A *new subject* transition occurs when you have two clips that do not relate closely, but have some relationship to each other. For example, the first clip might show how to load paper into a new printer, while the second clip might show how to attach a FAX device to the printer. Both clips are about the printer, but they are also about different topics. This is a more abrupt change, and you can signal the change by using an appropriate transitional effect. In this example, a wipe would be a good choice.

A *breaking* transition occurs when two clips are about very different subjects. If you have a series of four clips that show different aspects

of a printer, and then have three clips that show different aspects of a copier, you should use a transitional effect that makes it clear that a major change is occurring. You may also want to add a title sequence to alert the viewer to what's going on. In this example, MGI VideoWave's *Boxes* effect would work well.

A *passage of time* transition conveys the feeling that a significant amount of time has passed. In this case, a slow dissolve between similarly composed clips will do the job. If you want to convey time passing before your eyes, a circle wipe will communicate the idea of a clock moving. Adjust the speed of the wipe to relate the amount of time that has passed.

How you make the transition from one clip to the next is very important, because transitions can have a meaning all their own. A transition can imply the passage of time, movement to another location, or reinforce an emotion. The next time you watch TV, keep an eye on the transitions and see if you can identify their meaning. Don't forget to experiment. You can preview your transitions and get a feel for the message they are reciting. In most cases the simple cut will do the job very well. The cut is the default transition in the MGI VideoWave Storyline, and will be the one you use most often. In fact, three-quarters of all transitions in movies and TV are cuts. If you have no particular meaning to convey other than the fact of a scene change, use a cut.

### **Content**

Video is movement, and can therefore be interesting in its own right. However, this can lead to the temptation to rely solely on movement in a video to keep the viewer's interest. If you want your productions to stand out, look for subjects that are interesting – this will greatly increase the impact of your video.

People make particularly interesting video subjects, but not if they are nervous about the experience. Help the subject of the video relax by minimizing the impact of the video taping process – don't constantly start and stop recording. Set everything up in advance, and let your subject act naturally.

For inanimate objects, get as close as you can to the object, filling the frame. PC video sizes being relatively small, you don't want to lose detail if you can avoid it. If the subject is large, keep the background simple so the primary subject is clear. Take some closeup shots. You can use them later during production to emphasize details.

### **Timing**

Unlike a book or other printed document, a video production rolls along in real time. The proper timing of various events – music, narration, dramatic moments, etc. – is essential if your video is to have the desired impact.

As you gain experience working with video, you will begin to develop a sense of timing. Timing is one of the most important assets you can have for creating video productions that are strong and effective. Knowing when to end a video clip, and start the next one, is something of an art. However, there are a few basic rules that will help get you started.

A good starting point usually involves action. You don't need a lot of time prior to the beginning of the action. In fact, the only reason to use any slack time at the beginning and ending of a clip is for use as part of a transition.

Every clip has a start and an end; you just have to find out where they are. Don't settle for just any ending point. Here's a tip: count the action beats in a clip. A beat is anything that happens – he picks up a pen, he touches his hat, he pauses for effect, he points to the audience. Everything that happens is a beat. End a clip on a strong beat.

Good things come in threes. A three-beat clip is often perfect. Or try two clips to set up the idea, and then hit hard with a third clip. Use same-subject transitions between the three clips, and follow the third clip with a new subject transition.

## **Pace**

For your video production, it is very important to find the right pace. If the video moves too slowly – that is, if the story is being told too slowly – your viewers will lose interest. If the video is too fast, your viewers will miss important information, and possibly tune out.

Keeping a video on the right pace can be difficult if you don't have experience with video production. Fortunately, there is a simple cure. Show your video to someone whom you trust to give you an honest opinion, and who is not familiar with the subject matter. Here are some questions you might consider:

- Does each video clip move the story along?
- Is each video clip contributing to the story?
- Is there any part of a clip that seems to be just hanging there, serving no useful purpose?
- Is each video clip long enough to make the point clear?

## **The critic over your shoulder**

With experience, you will learn to be your own best critic. Until then, sit down to look at your video-in-progress with an imaginary critic looking over your shoulder. Ask yourself if the video you are creating will be interesting and useful to another viewer.

## **Preproduction**

Everyone from professionals to casual video producers should take some time to do a little preplanning and preparation. This can markedly improve the quality of the video shot, and reduce problems during the shoot. Preproduction can be as simple as a hand-written script, or as intricate as organized casting, location scouting and professional scripting.

### **Script**

Industry professionals usually have a detailed description of every line spoken and every shot made. Productions without dialogue benefit from having a Storyline, which is a series of simple drawings intended to represent the shots. Even the simplest project will benefit from having an organized Storyline.

### **Scouting**

Check out your shooting location in advance. This will allow you to spot problems and plan your strategy. Typical things to look out for include having enough space to shoot, lighting and sound conditions, electrical outlets to reduce battery drain, and (if you will be shooting in a house or business) consult with the proprietors.

### **Preparation**

First, ensure that your main batteries are fully charged, and carry charged spares along with a charger unit and extension cord to take advantage of any AC outlets. Be sure that you have enough blank tapes – it's better to shoot too much video than not enough.

## Production

### Lighting

Adequate lighting is vital for creating high-quality video. In low light conditions, most consumer video cameras generate noise. Random noise in an image decreases redundant information, leading to poor compressed video quality and higher data rates.

Use natural light whenever possible. The best light occurs outside on a cloudy or overcast day, because the light is evenly diffused. Direct sunlight produces good exposure, but it can create areas of deep shadow where video noise can be prominent.

Reflectors are used to bounce light onto the subject. Reflectors produce more even lighting and can also reduce areas of deep shadow.

If possible, avoid fluorescent light. The color temperature of fluorescent light make videos look blue-green. If you're in an area with predominantly fluorescent lighting, shoot near windows to take advantage of the natural light, but remember it is best to direct the camera away from the windows to avoid reflections. If windows are used as a background, your subject will appear too dark, as your camcorder's exposure will set itself relative to the bright outdoor light.

### Color

Avoid saturated colors in the scene. Video with highly saturated colors (especially red) can bleed or appear blocky, particularly when viewed on 8-bit (256 color) displays.

Avoid adjacent areas of high contrast. For example, clothing with a combination of light and dark patterns is a poor choice. Sudden changes in brightness levels can emphasize color bleeding and create edges that are more difficult to compress.

Avoid extremely thin horizontal or vertical lines. Areas of fine detail are not always particularly visible after compression, especially when displayed in a multimedia application window. Moreover, extremely fine lines or patterns (such as those that are one pixel wide) can distort the source video image itself. Such distortion looks bad and is

extremely difficult to compress, resulting in poor compression of the distortion, severely impacting video quality.

### **Camera Techniques**

Unnecessary camera movement distracts the viewer. Your viewer should notice the subject, not the camera. Keep movement to a minimum, and ensure panning is smooth and steady.

A tripod keeps your video stable, and focuses attention on the subject instead of the camera. Also, because a camera on a tripod is steadier, more information is redundant between frames, yielding better compression.

Don't overuse pans and zooms, as these camera techniques tend to de-emphasize the subject. Pans and zooms also limit how much can be compressed since nearly every pixel changes between frames. Rather than zooming, break the action up into two static shots: one long shot and one close-up. Use other techniques to create visual excitement.

For example, instead of centering your subject in the frame, create a more dynamic shot by placing the subject to one side of center and directing her attention to the other side of the frame. This is otherwise known as "the rule of thirds," whereby you visualize the frame in a tic-tac-toe pattern of lines. The subject of primary interest should be slightly off center, on one of the imaginary lines.

Use close-ups. Remember that your video will probably be played within a relatively small window on a PC display. Close-ups will emphasize your visual message in this medium, but can also work well on a full size television screen.

Use autofocus only where appropriate. Autofocus works well for most medium and wide shots. Don't use it, however, in close-ups where the subject is moving, or when zooming in on a subject. The entire image can blur and then sharpen as the camera attempts to stay focused on the object in the center of the frame. This is not only distracting, it also limits the effectiveness of compression, because every pixel changes as the camera refocuses. Instead, before you shoot, disable autofocus, zoom in to the subject, center and focus on the most important subject and then zoom back to your original composition. This ensures that the important subject will remain sharp at any zoom setting.



## Video Publishing Process

Now that you are familiar with video publishing terminology and have an understanding of the concepts behind good videomaking, you are ready to begin the video publishing process. MGI VideoWave lets you sit in the producer's chair – you are in charge of the clip order, transitions, sound, and visual effects. The first step is to plan your video presentation:

Establish an **objective** – what is it that you are trying to give the audience? Are you trying to sell a product or idea, or are you producing a music video designed to entertain?

Develop an appropriate **close** that will neatly end your presentation. The close dictates the body of your presentation; by designing the close first, you guarantee that the questions raised in the opening lead naturally to your conclusion.

Create a strong **opening** that will get the audience's attention.

Determine the factual and emotional **messages** that will promote your objectives.

Create a **Storyline**.

**Evaluate** your presentation by testing it on the kind of audience that will view it.

You might want to take a few moments to write down a general description of the flow of actions in your video production, or make a sketch of its sequences (a Storyline). This will allow you to get your ideas down on paper for later reference, and can help keep larger productions manageable.

### Selecting your source material

First, you should plan your video presentation to determine what sequences it will have. Then, decide what source material you want in your video presentation. For example, it might include animation, single-frame images (.PCX, GIF, etc., files), audio (.WAV files) or video files. If you have a stock of source

material, you can lay out and organize your sequences in the MGI VideoWave Storyline.

### **Editing your Source Material**

Use the *Video Studio* to edit the video and graphic elements of a single scene, and to create text. The Scene Editor's preview feature lets you play the scene while you edit it.

Using the *Audio Editor*, you create and edit the soundtrack.

### **Assembling your Source Material**

Use the Storyline to assemble your scenes into a video presentation. Using the *Storyline*, you can put together animation, graphic images, and audio (an entire music track, if you want), and link them with Transitions. The Storyline also provides a preview feature that you can use to play your video presentation before you produce the final version.

You don't need to prepare your source materials: simply include them where you want them in the Storyline.

### **Pre-producing Scenes**

In some cases, you may wish to have text animations cover more than one clip. This can be accomplished by creating a scene. Take the clips you require, insert them into the Storyline, add the desired transitions and produce a scene. The resulting video will be treated by MGI VideoWave as a single clip.

### **Producing the Final .AVI or .MPG File**

When you have finished editing and assembling your scenes, you produce the video presentation. MGI VideoWave then compiles the scenes that you have assembled in the Storyline. The resulting video presentation is a new **.AVI or MPG** file. Produced files can be re-used in the Storyline to build larger video presentations. However, if you wish to edit your work further, it is also possible to save your work as an MGI VideoWave **.SBD**, which will preserve the Storyline clip order for easy editing.

## Glossary

**Accelerator** A hardware unit that assists the CPU to speed up a particular process. For example, a graphics accelerator speeds up the processing and display of graphics.

**Access Time** In digital storage devices such as a hard drive or CD-ROM unit, the time it takes to retrieve the first bytes of the desired file.

**Adaptive Differential PCM (ADPCM)** A compression technique that depends on the incoming data being similar from one sample to the next. As a result, fewer bits can be used to represent the changes between samples, rather than representing the entire samples themselves. ADPCM is used for audio compression, where it can deliver up to 4:1 compression.

**Additive Color System** A color reproduction system in which an image is displayed by mixing appropriate amounts of red, green, and blue lights, as in a CRT. It is the color system used by color television and computer displays.

**Aliasing** An effect caused by the visibility of individual pixels on sharply defined edges in a digital picture. It shows as jagged edges that are particularly noticeable on diagonal lines or text characters.

**Amplitude** In electrical signals, the measurement of signal strength. For example, in audio, amplitude refers to loudness; in video, it refers to brightness.

**Analog** Applies to a system in which values are represented by continuous scales.

**Analog Production** Production (audio and/or video) where analog (as opposed to digital) recording devices are used.

**Analog to Digital Conversion (ADC)** The process of creating a digital representation of an analog signal (also called digitization).

**AntiAliasing** A process that reduces the visibility of the Aliasing effect on edges by modifying pixels around the edge with intermediate colors between the light and dark colors making up the edge.

**Artifact** An defective element in the reproduction of a natural image or sound. It is a distortion that interferes with the proper reproduction of the original.

**Audio Video Interleaving (AVI)** In digital video files, the practice of placing together the audio and video data for each block of time, such as a video frame – 1/30th second.

**Bandwidth** Refers to the range of frequencies contained in a signal or to the frequency handling range of a transmission.

**Bit** The fundamental unit of digital data. Its value can be either 0 or 1.

**Bitmap** A graphic image made up of individual color or monochrome pixels.

**Bits Per Pixel (bpp)** The number of bits used to represent the color value of each pixel in a digitized image.

**Bus** In a computer system, the means for interconnecting the various units of hardware, such as the CPU, RAM, disk drives, video, etc.

**Byte** A digital value represented by eight bits. A byte represents integer values between 0 and 255.

**Cache** A region of memory in a computer that is used to temporarily store a block of data retrieved from mass storage such as RAM or disk. In case the CPU needs to access the same area of mass storage again, it first looks in the cache because that will be accessed much faster than another access to RAM or disk.

**Camcorder** A hand-held unit that combines a video camera and a video recorder.

**Capture** The process of bringing video or audio signals into a digital system. It normally requires conversion to a digital format for storing in the mass storage of the computer.

**Central Processing Unit (CPU)** The unit that performs system control and computing in a personal computer. The CPU is usually a single microprocessor chip.

**Charge-Coupled Device (CCD)** A solid-state video camera pickup device for converting optical images to electrical signals. CCDs are very popular for their high performance, stability, and reliability.

**Chroma Keying** In television production, the process of placing one image over a second (background) image by making areas of the first image transparent in the combining process. A specific color (often blue) is used to define the transparent areas.

**Chrominance** In color video systems, signal components that convey the color information; usually in the form of color difference signals.

**Clip Media** A clip library for any type of medium such as audio, video, images, animation or artwork.

**Clock Frequency** In a microprocessor, the frequency at which the internal circuits run. For microprocessors of the same type, a higher clock frequency will give faster performance.

**Compact Disc Read Only Memory (CD-ROM)** A digital data version of the audio CD (Compact Disc). The CD-ROM can be inexpensively replicated and holds up to 680 megabytes of data. Because it is read only, the data cannot be changed by the user.

**Component Video** A color video signal system that uses more than one signal to describe a color image. Typical component systems are RGB or S-video.

**Composite Video** A color video signal system that contains all of the color information encoded into one signal. Typical composite television systems are NTSC, PAL, and SECAM.

**Compression** A digital process that allow data to be stored or transmitted using fewer than the normal number of bits. For example, video compression refers to techniques that reduce the number of bits required to store or transmit images or video.

**Contouring** In digital video systems that cannot display enough colors, an artifact called contouring becomes visible as the system abruptly switches from one color to the next when it tries to reproduce smooth color shading.

**Coprocessor** A microprocessor that assists the main CPU for a specific task, such as floating-point math or video compression or decompression.

**Data Transfer Rate** In a digital transmission or bus system, the rate at which data moves – usually expressed in megabytes per second (MB/sec).

**Decompression** The process of restoring compressed data into its original uncompressed form.

**Digital** A system in which values are represented by groups of bits, a 0 or 1.

**Digital Effects** In a video system such as television, the use of digital technology to achieve dynamic transition effects such as zooming, sliding, or rotation.

**Digital Production** A production process for video and/or audio where the scene is captured directly to digital format.

**Digital to Analog Converter (DAC)** A device that converts digital signals to analog. A DAC is used to convert the data going from a computer to a display monitor.

**Digitize** To convert to digital, as in an analog to digital converter (ADC).

**Display Accelerator** A special purpose integrated circuit that assists the CPU in performing display functions. Display accelerators are usually located on a video display adapter board.

**Display Memory** The memory that holds the screen image for monitor refresh. It is usually located on the video display adapter.

**Dissolve** A video or audio transition where one signal drops in amplitude while a new signal increases in amplitude to achieve the transition. The effect is a temporary overlap of the signals as the first signal dissolves into the second signal.

**Distortion** When transmitting or processing electrical signals, any undesirable changes to the signal due to spurious effects in the circuit or transmission path.

**Dithering** In video display systems that have a limited number of colors, the effect of more colors can be achieved by dithering, which is alternation of colors among adjacent pixels. It works to the extent that the viewer does not see individual pixels, but rather their eye averages the dithered pixels to a different color.

**Driver** A software entity that provides an interface to a specific piece of hardware. For example, a video driver provides software access to the video board hardware.

**Fade** In audio or video postproduction, a transition where one signal fades out to blank or silence followed by a second signal fading up to normal levels.

**Field** In interlaced television systems, a field is one vertical scan period, typically scanning alternate lines of the complete image (frame). Thus, it takes two fields to scan the complete frame.

**Font** A definition for drawing a set of text characters. It may be either in the form of a bitmap for each character or a mathematical description of how to draw each character in the specific style of the font (a vector font).

**Frame** A complete scan of an image. In interlaced systems, a frame is two vertical scans (fields). In non-interlaced or progressive-scan systems a frame is completed in one vertical scan. A frame is one complete image of a motion video sequence. In motion video, images are presented typically at 30 frames per second to create the illusion of continuous motion.

**Frame Grabber** A hardware add-in board that is capable of capturing and digitizing a frame from a real-time analog video stream.

**Frequency** The repetition rate of a periodic process. Frequency is normally expressed in cycles per second, for which the engineering term is Hertz, abbreviated Hz.

**Frequency Response** In electrical circuits, the response of the circuit to a range of frequencies, usually expressed as a graph of amplitude vs. frequency.

**Graphical User Interface (GUI)** A computer-user interface that combines a graphical screen capable of displaying graphics and images with a pointing device such as a mouse, which allows the user to move a pointer object on the screen. The user makes selections and issues commands by clicking the mouse button(s) while the pointer is over an icon representing the desired task.

**Hard Disk** A mass storage device based on read/write magnetic recording on one or more rigid rotating disks.

**Hertz (Hz)** The unit of frequency – one Hertz is one cycle per second.

**Hi-8** A high-quality VCR tape format based on the 8mm tape size.

**High Color** An alternate name for a color display system using 16 bits per pixel. Such a system can reproduce up to 65,536 unique colors.

**Interface** In computer software, a connection between two entities; for example, an application programming interface (API) is the software connection between an application program and the system software of a PC. Similarly, a user interface is the way that a user sees, hears, and controls a computer.

**Interlaced Video** Televisions display images by projecting electron beams that sweep across the screen horizontally, in what are called scan lines. Each video frame is split into two fields, where the even numbered scan lines form one field and the odd numbered scan lines form the other field. These scan lines are projected from the top of the screen to the bottom many times per second, with the two fields



alternating fast enough so that the eye perceives a whole image. Interlacing refers to the fact that two fields of information are projected to form the whole image. By contrast, most computer displays are non-interlaced, where the electron beams scan all rows of the screen sequentially before repeating the process.

**Joint Photographic Experts Group (JPEG)** A working party of the ISO IEC Joint Technical Committee 1, that developed standards for compression of still images, called JPEG.

**Lossless Compression** When the result of compression followed by decompression is exactly the same as the original.

**Lossy Compression** When the result of compression followed by decompression is not the same as the original. Normally a lossy compression system will throw away data that the end user will not easily see or hear.

**Luminance** In color video systems, a signal component that represents only the monochrome brightness values of the image.

**Media Control Interface (MCI)** In multimedia computers, a device-independent software standard for communicating control information between applications and the system.

**Mixing** In audio postproduction, the process of combining several tracks into an output track.

**Motion compensation** In video compression, the process of determining what parts of the picture have moved from one frame to the next. Only the parts that move need to be included in the data stream.

**Motion Picture Expert Group (MPEG)** A working party of the ISO IEC Joint Technical Committee 1, working on algorithm standardization for compression of motion video for use in many industries.

**Multimedia** In computers, the presentation of information or training by using audio, motion video, realistic still images, and computer metaphors.

**Multimedia Personal Computer (MPC)** A PC that contains equipment for multimedia, such as audio, video, and CD-ROM hardware. Standards for MPCs are published by the Multimedia PC Marketing Council, an organization of PC manufacturers.

**National Television Systems Committee (NTSC)** The standardizing body that in 1953 created the color television standards for North America. This system is called the NTSC color television system.

**Nonlinear Editing** In conventional (linear) audio or video editing, one must re-record the edited sequence every time a change or addition is made. In nonlinear editing with a computer, the edited sequence is stored as an edit decision list (EDL) that can be played at any time by using the random-access capabilities of the computer's mass storage, to instantly retrieve and present audio and video.

**Object Linking and Embedding (OLE)** In multitasking operating systems, a means for sharing data between applications such that the user can access or edit the data from either application.

**Palette** The collection of colors that can be simultaneously displayed on the screen. Some systems that have a limited number of palette that can be customized from a larger array of colors. This is called a color lookup table. However, a single image or single screen still cannot have more colors than will fit into a single palette.

**Peripheral Connect Interface (PCI)** A local bus specifically designed for use with the Intel Pentium processor.

**Phase-Alternating Line (PAL)** The name of the color system used in most of Europe and other parts of the world. It is similar to but incompatible with NTSC.

**Pixel** A single point of an image, having a single color value.

**Pixellation** The effect produced when there are too few pixels for the size of the image. Pixels become visible as small rectangles or squares of color.

**Postproduction** In video or audio, the process of merging original video and audio from tape or film into a finished program. Postproduction includes editing, special effects, dubbing, titling, and many other video and audio techniques. Digital postproduction can be done with a computer.

**Primary Colors** The three colors needed to reproduce color images. For additive color systems that combine colored light, such as video displays, the primaries are red, green, and blue. For subtractive color systems that use color filters or inks, such as photography or color printing, the primaries are magenta, cyan, and yellow.

**Production** In video, refers to the process of creating programs. In more specific usage, production is the process of getting original video onto tape or film and ready for postproduction.

**Productivity** In computer applications, refers to applications that assist the user in doing their job. Typical productivity applications are word processors and spreadsheets.

**Pulse Code Modulation (PCM)** The system of sampling an analog waveform and quantizing the samples to produce a digital data stream representing the analog waveform.

**Quantization** In digitization, the process of converting samples to digital values.

**Quantization Noise** The visual or aural effect caused by poor quantization (usually too few bits).

**Random-Access Memory (RAM)** Memory that can be directly accessed at any location, for example, at every byte position. RAM usually refers to the main memory of a computer, which is solid-state read/write memory.

**Read-Only Memory (ROM)** A special type of solid-state memory where the data is permanently written into the chips and cannot be changed after chip production. It is especially used for holding the BIOS software in PCs.

**Reference Frame** In video compression, a frame that contains all its own data and can be reproduced independent of previous or future frames.

**Render** In computer graphics, the process of creating an image or screen from mathematical or computer-language descriptions.

**Resolution** The ability of a video system to reproduce fine detail. In analog systems it is defined by the number of scanning lines and the bandwidth; in digital systems it is determined by the number of pixels in the horizontal and vertical directions.

**Reverberation** In audio systems, the multiple echoes that occur in an enclosed space, such as a concert hall or church. The effect can be achieved electronically by the use of delays.

**RGB** Refers to red, green, blue, the additive color primaries. An RGB video system had three signal wires, one for each of the primary colors.

**Run-Length Encoding (RLE)** A data compression technique that exploits equality of adjacent data objects such as bytes or pixels.

**S-Video** A component video format that handles the chroma and luminance components in two separate channels. It provides better performance than NTSC and is used to interface higher quality VCRs, TVs, and monitors.

**Sampling** The process of reading the values of an analog signal at evenly spaced points in time.

**Sampling Rate** The clock frequency for sampling or the number of samples per second.

**Scaling** A process for changing the size of an image.

**SECAM** acronym for *sequential couleur et memoire*, the color TV system developed in France and used there, in Russia, and in various other countries in Eastern Europe.

**Sensor** A device for converting natural sources such as audio (microphone) or video (CCD chip) into electrical signals.

**Signal to Noise Ratio** A measure of the amount of noise present in an analog system. It is usually expressed in dB.

**Small Computer System Interface (SCSI)** A special bus for connecting devices to a PC. Most often used to connect CD-ROM or hard disk drives.

**Subsampling** In video compression, the process of reducing the pixel count for the color components of an image, done by discarding samples in a regular pattern.

**Subtractive Color** Color reproduction by mixing appropriate amounts of color paints or dyes on white paper, used for color painting and printing. The color print primaries are magenta, cyan, and yellow.

**Super VGA (SVGA)** An extension of the VGA specification that offers increased resolution and/or increased number of colors for many newer PCs. The use of Super VGA requires increased video memory and higher-performance display monitors.

**Talking Head** In video and audio production, a closeup shot of someone speaking.

**Time Code** In video or audio recording, a track that records a unique time or frame count code for subsequent use to identify cuts for editing.

**Transparency** In a digital image, the process of defining one or more color values that will not be reproduced when the image is copied over another image. Instead, pixels having the transparency values will still display the previous image. This is used to overlay objects over a background, such as the spaceship in front of a star field in a science-fiction film.

**User Interface** The means by which a user communicates with a computer. It includes not only the devices used (mouse, keyboard, touch), but also the objects on the screen and the sounds made by the computer in response to the user.

**VHS-C** A modification of the VHS VCR recording cassette in a smaller size for portable recording. VHS-C cassettes are playable on standard VHS VCRs by means of an adapter.

**Video Cassette Recorder (VCR)** Equipment that records and plays back video and audio from a videotape cassette. VCR standards are available for home, professional, and broadcast use.

**Video Graphics Array (VGA)** A standard display type for many older PCs. VGA provides many optional formats, but the most common one is 640x480 pixels with 16 colors.

**Video overlay** Analog video that has been converted so it can be shown on a computer display along with the computer's own images and graphics.

**Voice-over** In audio postproduction, the technique of using a narration track instead of, or in addition to, natural sound from the scene.

**WAVE** A standard for digital audio, based on PCM sampling of analog audio without compression.

**Wavetable** In digital music synthesis, the storing of sampled segments of actual instrument sounds from which are assembled musical notes at any pitch.

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