broadcaster ELITE

non-linear video editing system

Producer User Manual

Applied Magic Inc.

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This is only a preliminary manual.
You will receive the final version in February.

Hardware and Software by

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Preface

Working with Producer is exciting! It is easy for an inexperienced user to get started, and for the more advanced Producer user, new and interesting possibilities open up all the time. There is always something more to learn. We hope that you the reader will find it just as fascinating to work with Producer as we ourselves have done.

Our goal has been to develop a video editing and production tool that would be easy to use and valuable to both the amateur and professional. We feel that we have achieved that goal with the Producer software and the Elite system. Producer is a complex program but it is easy to use. You will be rewarded with each new skill that you acquire. This is not like any software you've used before. You will need to read this manual. The additional work is definitely worth the effort.

Much of the content of these chapters is information every user should know in order to make effective use of the Elite system. The more complete your comprehension of how the system works, the easier your creative sessions become. Time invested in learning about the system is rewarded many times over. In the long run, it will save you time and money to learn and use as much of the software as possible.

This is by no means a complete manual, it is just a preliminary version. We are in the process of completing the final version of this manual. You should receive it very soon. We continue to advance and improve the system and software each day. Periodically we will release both new versions of the software as well as more up-to-date documentation.

Please feel free to send us suggestions, comments and bug reports. Also, since this version of the manual is a preliminary one, if you find any inconsistencies or mistakes, please fax them to Lori Todd so that we can make sure to correct them in the next revision.

Many thanks to all of our very loyal customers who have hung in there with us. We appreciate your patience, patronage, and support.

Sincerely,
The Applied Magic team!

We want to especially thank Jamie Krutz for all of his hard work on this manual!

Menus

Installation

Proper installation is the key to a happy system.

It isn't difficult to install the Broadcaster Elite, but if opening your computer makes you nervous, have it done by your local dealer.

If you do it yourself, relax, take your time, and work carefully. As they say, a job done right is faster than a job done twice.

It's a good idea to install the card in a well lit area, and make sure you ground yourself.

Here we go!

System Requirements

The first step is to make sure you have the proper components. In order to use the Broadcaster Elite, you need to have the following software and hardware.

Software Requirements

- **AmigaOS 3.0 or greater**

  The A4000 comes with AmigaOS 3.0.

  If you are using an Amiga 3000 or 3000T you need to upgrade the operating system software to AmigaOS 3.1 or greater.

- **The Producer_Install disk the Producer_Anims disk**

  These are the disks that came with your Broadcaster Elite.

board Rev. 3.1. The U209 chip on the CPU Daughterboard must be Rev 02.

If you opt for the Fastlane SCSI II controller, it is important to get the version that will work with the Broadcaster Elite on your computer. Not all versions of the Fastlane work properly with A4000s and only the newer versions work with A3000s (see Hardware Options).

The Elite works with either a 68030 or 68040 CPU. With a 68040, transition effects will render faster.

- **Computer monitor**

  You need an RGB monitor that works with your Amiga. This is the monitor you will use to work with Producer, the editing software that comes with the Broadcaster Elite.

  If you have a graphics card (see Hardware Options), make sure you use a multisync monitor that will take advantage of the capabilities of your card. You'll like running Producer's windowing interface on a higher resolution screen.

- **Video monitor**

  You need one video monitor so you can watch your video as you edit. It can be any monitor capable of displaying PAL or NTSC video. You can connect it to your Broadcaster Elite's breakout box using any of the outputs: composite video, S-Video (Y/C), or component (YUV or Y/B-Y/R-Y) video.

- **SCSI II Hard Drive controller**

  The Elite works with either the Fastlane , from Advanced Systems & Software, or the WarpEngine, from MacroSystems Development.

  Note: MacroSystems Development is not the same company as MacroSystems Germany.

Note: The Elite will also work with the built-in SCSI controller in A3000(T)s, but only at low video quality levels. The A3000's built-in SCSI controller is not SCSI II and does not allow for the fast throughput needed for high quality video. For best use of your Elite, ***you should get a SCSI II controller.***

The Broadcaster Elite WILL NOT WORK with the Commodore A4091 SCSI II controller.

The stock IDE drive of the Amiga 4000 CANNOT BE USED to record video or audio with the Broadcaster Elite. Use your IDE drive for your system software and applications.

Older SCSI devices like hard drives, CD-ROM drives, removable media drives, tape drives, and scanners will limit the speed of the SCSI II bus. If you have such devices you must connect them to a separate SCSI hard drive controller. Other SCSI II hard drives, CD-ROM drives and tape drives can be connected to the same SCSI II bus as your audio and video drives.

If you get a Fastlane and you have an A3000 or A3000T, make sure that the Fastlane is version 2.4 or higher. Previous versions will not work in A3000(T)s.

Version 2.4 and above Fastlanes will also work on A4000s. If you have an earlier version and the serial number is 31001135 or higher, Applied Magic is authorized to modify it to work on an A4000. Contact us for more information.

Older Fastlanes can be upgraded. If you have a Fastlane with a lower serial number than 31001135, contact Advanced Systems & Software about sending it to Germany to be upgraded.

All versions of the WarpEngine work with the Elite. There are different versions for the A3000(T) and the A4000, so make sure you get the correct WarpEngine for your Amiga. The WarpEngine is also an accelerator card that comes in

several CPU configurations. Faster CPUs will render Producer transitions faster.

Both the Fastlane and the WarpEngine give you room to add RAM to your computer. Since the WarpEngine is also an accelerator card, it uses the CPU slot rather than a Zorro slot, which frees up a Zorro slot for other uses.

- **SCSI II Hard Drives**

  Currently, the Elite has been tested and approved to work with the Seagate Barracuda 1.7 and 2.1 gigabyte hard drives for video. You can connect up to seven hard drives on one SCSI II controller. You need at least one Barracuda to do high quality video recording and playback.

  Note: At the time this manual was printed, the Seagate Barracuda drives are the only drives approved for video with the Elite system. In the future, as faster drives are released on the market, contact us if you have questions about compatibility with the Elite.

  You must have a second SCSI II hard drive for audio. Any SCSI II drive will provide fast enough performance for your audio drive. A Barracuda is not required for audio, but if for example, you are doing audio intensive productions like rock videos using a Barracuda for audio is not a bad idea.

  You need another hard drive for your system software and applications. This can be an IDE drive, a SCSI drive if you have a second SCSI controller, or a SCSI II drive if you have it on the same SCSI II bus as your video and audio drives.

  You can get approximately 5.5 minutes of video per gigabyte of hard drive space at the highest obtainable quality level (Broadcast 2), and about 46 minutes per gigabyte at the lowest quality level (Rough 1). Broadcast 2 quality is only obtainable if you do not use more than 2 channels of audio. There are also higher video quality settings that will become usable

when hard drives get faster. Keep in mind that drive space usage depends on the detail level of your source video, so your performance may vary. These numbers are just estimates.

Most people edit at quality levels that offer about 8 minutes (S-Video 2) to 15 minutes (VHS 2) per gigabyte while still offering appropriate picture quality.

Digital audio requires a transfer rate of approximately 5 megabytes per minute per track. This is about 200 minutes of mono audio or 100 minutes of stereo audio per gigabyte.

- **RAM**

  You'll need at least 4 megabytes of "fast" RAM and 1 meg of "chip" RAM.

  Note: "Fast" RAM is the RAM in your Amiga that is not shared by the custom chips. It's called "fast" RAM because the CPU can access it faster than the "chip" RAM shared by the Amiga custom chips.

  You will need 8 megabytes of "fast" RAM to generate transitions.

  Since the Amiga lets you run many programs at the same time, you should have a lot of RAM installed in your system. You can add up to 16 megabytes of fast RAM to your Amiga's motherboard. Both the Fastlane and WarpEngine have space for additional RAM. If you have a WarpEngine, add RAM there first for the best system speed. The next best place to add RAM is your motherboard. Finally, you can also add RAM to your Fastlane. The reason for adding RAM to your Fastlane last, if at all, is that older Fastlane cards have reduced memory performance which can slow your system. Applied Magic can assess your Fastlane card capabilities. Call us if you have questions.

  Producer requires an extra 2 megabytes of memory to render

internal transitions. This memory is allocated from the system the first time you open the Render Internal Transitions window. If Producer is unable to access enough memory, you will see an error message. If this happens, shut down all of your other open programs and try again. If you still see the requester, you need to install more memory. You need at least a total of 8 megs of fast RAM to render transitions.

- **Sound Card (not required if you don't need audio)**

  The Elite currently supports the SunRize AD516 digital audio card for 16 bit, 44.1 kHz CD quality stereo audio.

  Early AD516 cards may require a modification to work with Zorro III expansion cards. Contact SunRize Industries if your card does not work with the Elite. SunRize can perform a modification that allows the AD516 to work properly with Zorro III peripherals like the Elite and the Fastlane.

Hardware Options

- **Graphics Card**

  A graphics card is not required but you might want to consider getting one, especially if you are using an Amiga A3000.

  Producer, the editing software that comes with the Broadcaster Elite, uses a 16 color screen. Without a graphics card 16 color screens are incredibly slow on an A3000.

  A graphics card is not as important on an A4000, but it is nice to have. The main benefit is a higher resolution screen for Producer's windowing interface.

  The Broadcaster Elite has been tested to work with the Village Tronic Picasso and the GVP Spectrum. It will likely work with other graphics cards. Check with Applied Magic before purchasing to make sure you get a card that is known to work

with the Broadcaster Elite.

- **A high speed DAT tape drive for backup.**

  Since your audio and especially your video take up so much hard drive space, it is definitely a good idea to have a fast, high capacity DAT tape drive to back up your drives. If you plan to connect the tape drive to the same SCSI II controller as your audio and video hard drives, the backup tape drive must also be SCSI II.

  You need special software to interface with your tape drive. We recommend AmiBack, from MoonLighter Software Development.

Installing the Hardware

This is what you should have received with your Broadcaster Elite:

- **A Broadcaster Elite Card**
- **A Breakout Box**
- **One Shielded Coaxial Ribbon Cable**
- **Two Producer Software Disks**
  Producer_Install and Producer_Anims
- **A Printed Manual (you should be reading it now!)**

To install your Broadcaster Elite card, this is what you need to do:

1. **Install the card in an available Zorro III slot.**

2. **Attach the Breakout Box to the Broadcaster Elite Card.**

3. **Attach your video equipment to the Breakout Box.**

1. Install the Broadcaster Elite Card

See your Amiga manual for a description of installing Zorro cards in your computer.

2. Connect the Elite Card to the Breakout Box

To connect the Broadcaster Elite card and the breakout box:

A. Connect one end of the shielded coaxial ribbon cable to the Broadcaster Elite card connector located in the cover plate opening.

Align one end with the Broadcaster Elite card, matching the screw with exposed threads with the smooth insert and vice-versa.

Make sure that both screws are tightened simultaneously. Screwing in one side at a time will result in a crooked alignment and an incomplete connection.

B. Attach the other end of the ribbon cable to the breakout box connector in the same manner.

Hard Drives and Controllers

Hard Disk Drives

At this time, the only hard drives recommended for use with the Broadcaster Elite are the Barracuda series drives from Seagate Technology, Inc. There are a few difficulties using drives larger than 2.1 gigabytes due to limitations of both the Amiga operating system and the currently available hard drive controllers. Contact Applied Magic for information on possible solutions or changes to the situation.

Up to seven of these drives can be installed on one SCSI hard disk controller for up to 14 gigabytes of storage using the Seagate ST12550N 2.1GB disc drives.

The amount of video storage the drive will hold depends on the quality at which the video will be recorded.

Preparing Hard Drives for Video Storage

Hard drives used for video storage must be configured in a very specific manner to obtain the best possible performance. Improperly configured drives can cause a variety of problems with the capture and playback of video.

Preparing drives with the Fastlane Z3 Controller

To configure the drive for use with the Fastlane controller you need to use the software included with it. If you have installed the Fastlane utility software on your hard drive, open the disk and/or drawer where it is contained. Otherwise place the floppy disk containing your Fastlane utility software into a floppy drive and double-click on the Z3 icon when it appears.

- **Double-click on the icon that says SCSIConfig. A message may appear as below:**

  The Device Geometry.Totalsectors [sic] is 0 for Unit <some number>

  Reloaded:

  TotalSectors = <some number>

- **If it does appear, ignore it and click Ok.**

A window will open listing the SCSI drives on the left and the SCSI controllers on the right. On the SCSI Drives side, an entry should appear for each drive attached showing Unit #, LUN #, and the model number of the drives.

- **Make a note of the unit number of the drive you have installed.**

  Unit # _____

- **Click on "Config Drive."**

  If you get a requester telling you that some information does not match, ignore this and click on Ok.

- **Click on "Reload Geometry."**

- **Click Ok to verify this operation.**

- **Ensure that Reselection is NOT selected.**

- **Ensure that Synchronous mode IS enabled.**

- **Click Ok to accept this configuration.**

- **Select the unit number of the newly installed drive noted above.**

- **Click on the Partition button and the window layout will change to display the partitions on the left and the filesystems on the right.**

  The Filesystem List should be empty. If there are any filesystems listed, they can be removed by clicking on them once and then clicking the DelFileSystem button.

- **Click on "Add FileSystem" to bring up the filesystem requester.**

- **Select the DBCFileSystem installed above, and click Ok.**

  The filesystem configuration window appears.

- **Click the cycle gadget that reads "FFS." Continue to click until it reads "Custom."**

- **In the Identifier field, type "0x44424300".**

- **Click the Ok button.**

  The Partition window re-appears.

- **Double-click on the partition to bring up the partition configuration window.**

- **Change the name of the partition to "DBC#" (where # is indicated, enter the unit number of the drive you just installed) and make sure to press the enter key after typing the new name.**

- **Ensure the Mask is set to 0xfffffffc.**

- **Ensure Boot is NOT checked.**

- **Ensure Mount is checked.**

- **Click on the cycle gadget that reads "FFS." Continue to click until it reads "Custom."**

- **Enter "0x44424300" into the Identifier field to link this partition to the chosen file system.**

- **Change the Buffers field to read 5.**

- **Click Ok and the previous menu will reappear.**

- **Click Ok to accept this partition.**

The main menu now appears.

- **Click "Save Changes" to write the changes to the drive.**
- **A message will appear asking if you wish to save the changes, click Ok.**
- **A second message appears verifying your choice, click Ok.**
- **Click "Quit".**
- **A message appears asking if you wish to reboot the computer. Remove the Fastlane Z3 disk from the computer and click Ok.**

The computer will reboot and an icon will appear for the new drive with strange characters written below it.

- **Click once on the new drive icon and pull down the Format Disk item in the Workbench Icons menu.**
- **Change the volume name to whatever you wish.**
- **Ensure the Put Trashcan option is NOT enabled.**
- **Click on "Quick Format" to format the drive (DO NOT USE THE STANDARD FORMAT unless it's time for lunch!)**
- **A requester will appear asking if it is Ok to format the drive. Click "Format."**
- **A warning will appear. Click "Format."**

The window will tell you it is initializing the disk and then the DBC DOS icon will appear on the workbench.

Preparing Drives With The WarpEngine (Preliminary Instructions)

- **Start HDToolbox from the CLI by typing:**

  1.System>hdtoolbox warpdrive.device

  This will bring up the HDToolbox program and tell it to use the WarpEngine's SCSI device driver, warpdrive.device.

  Once up, the main window of HDToolbox will be presented showing a list of the devices connected. The column labeled Address should include the SCSI ID of the drive you have just installed. The column labeled Drive Type may show the manufacturer, model number and firmwarerevision of the drive.

- **Highlight the newly connected drive by single-clicking on it in the list.**

- **Select the Change Drive Type button located on the middle-left of the HDToolbox window.**

  You may get a warning message concerning changing drive parameters and losing existing information. For new, un-configured drives this is not a concern and you may ignore it.

- **The Set Drive Type window will open and a list of known drive types will be displayed in the center. If you have previously configured the same model of drive, it should be listed. If the drive is listed and you wish to use the same configuration, select it and click the Ok button.**

- **If your drive is not listed, click on the Define New... button. The Define/Edit Drive Type window will open, allowing you to enter/edit the drive geometry.**

- **Click on the Read Configuration button and HDToolbox will inquire the drive to determine the appropriate values for the different parameters. A warning/information window will open. Read the information and then click on the Continue button.**

  HDToolbox will then fill in the various parameters with as much information as it can get from the drive. If HDToolbox is unable to get sufficient information from the drive, you will have to enter the values manually from the manual or spec sheet of the hard drive.

  For the Seagate Barracuda ST12550N, the following information should be displayed:

  Manufacturers Name: SEAGATE
  Drive Name: ST12550N
  Drive Revision: 0014 (Current as of this printing.)

  Cylinders: 2731
  Heads: 19
  Blocks per Track: 81
  Blocks per Cylinder: 1530

  Size: 2088450K (2039 Meg)

  These are safe values for the ST12550N and should be used when configuring this drive. If you are configuring a different drive, you will need to determine the appropriate values from the documentation for the drive. It is important that the values entered generate a resulting Size that is less than or equal to the drives formatted capacity.

- **Make a note of the number of cylinders for use in setting the partitions.**

- **If the Supports reselection button has been checked by the Read Configuration operation, click it once to un-check it.**

- **Once the parameters have either been accepted as read from the drive or entered manually, click on the Ok button to return to the Set Drive Type window. The drive type information will be saved automatically into the drive definitions file.**

- **Your new drive type should be displayed on the Drive Types list. Make sure the correct drive type is highlighted and click on the Ok button to return to the main HDToolbox window.**

  You may get a warning requester about changing drive types and losing old partitions. Click on the Continue button.

- **Select the Partition Drive button. This will change the HDToolbox display to the Partitioning window.**

  HDToolbox will default to two partitions of equal size for the drive. The partitions are graphically represented by a bar in the top of the window. A legend above the window explains the display.

- **Click on the rightmost partition to make it active and then click the Delete Partition button. The first partition will become active with a blue pointer beneath it at the end. Drag the pointer all the way to the right by clicking on the blue pointer and holding down the left mouse button while moving the mouse to the right.**

- **Click on the Advanced Options button so that it is Checked. The bottom of the display will change to show additional buttons and gadgets for configuring the partition.**

  The new gadgets display the Start, End and Total Cylinders for the Partition. The Start Cylinder should be 2 and the End Cylinder should be one less than the number of Cylinders reported when you set the drive type.

- **Change the Buffers to five.**

- **Click on the Bootable button to un-check it.**

- **Change the Partition Device Name if desired. Applied Magic suggests using the initials DBC and a number representing the SCSI ID of the drive, ie. DBC4 for the partition on drive SCSI ID 4. Doing this makes it easier to associate a partition with a SCSI ID number on a list of drives like the main display of the HDToolbox.**

- **Click on the Add/Update... button to go to the File System Maintenance window. A list in the center shows the filesystems loaded into the RDB of the drive. Use the Delete File System button to remove any existing filesystems. Then click the Add New File System... button to bring up a requester for selection of the DBC-Filesystem. The requester will default to "l:FastFileSystem". Change this to "l:DBCFilesystem" and click the Ok button.**

- **A new window will open and you will enter in the DosType for the filesystem. The correct DosType identifier for the DBCFilesystem is 0x44424300. Enter this value carefully into the DosType gadget and hit return. Then click the Ok button. The list should now show one custom filesystem with the DBCFilesystem identifier. Click the Ok button to return to the Partitioning window.**

- **Click on the Change button and the File System Characteristics window will open. Click on the Custom File System button. The Identifier field will clear and you should enter the DBCFilesystem DosType identifier 0x44424300. The Automount this partition button should be checked. If it is not, click on it.**

- **Click on the Ok button to return to the Partitioning window.**
- **Click on the Ok button to return to the main window.**
- **Click the Save Changes button to write the RDB to the drive. The button should become ghosted and the Status of the drive will toggle the entry to Not Changed.**
- **Click the Exit button to quit HDToolbox.**
- **Reboot the system to make the changes take effect.**

The DBCFileSystem

In order to obtain the required performance from the drives, a custom filesystem is used for reading and writing the captured video data to the drives. The filesystem is the DBCFileSystem and was installed into your L: directory as part of the normal Producer software installation.

The DBCFileSystem must be used on all hard drive partitions that you plan to use for recording video. Applied Magic strongly recommends that you use the DBCFileSystem for your audio partitions as well.

Most current Amiga hard drive controllers support Commodore's Rigid Disk Block (RDB) standard which is used for mounting drive partitions at system boot. The RDB can also contain a filesystem to be used for each drive's partitions. By loading the DBCFileSystem into the RDB of your video and audio drives and setting the appropriate flags and parameters, your drives will be automatically mounted with the DBCFileSystem when you boot up your system.

Testing the Hard Drive Speed

Good hard drive performance is critical to the correct operation of your Broadcaster Elite. To verify that you are getting the best possible transfer rates from your hard drive, use the supplied SpeedTest program. If

the standard installation procedure was followed, the SpeedTest program will be found in your Producer:Tools directory which was added to your shell command path. The SpeedTest program must be run from the command shell.

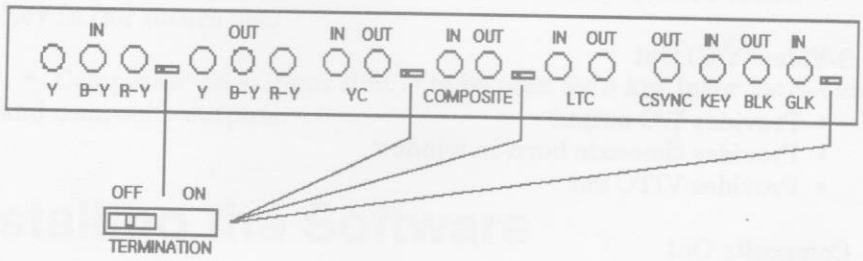
Syntax: SpeedTest <Drive>

Example: Speedtest DBC1:

With an empty Seagate ST12550N Barracuda drive, Speedtest should return a read/write speed of 5.2 to 5.4 megabytes/second. If the results from this program do not meet the expected results, feel free to call us with questions. This will be addressed further in the Troubleshooting section of the final revision of the manual.

Connecting the Breakout Box

The breakout box gives you a variety of inputs and outputs:



- **Component In**
- **Component Out**
- **S-Video (Y/C) In**
- **S-Video (Y/C) Out**
- **Composite Out**
- **Composite In**
- **LTC (Longitudinal Time Code) In**
- **LTC Out**
- **CSYNC (Composite Sync) Out**

- **Genlock In**
- **Black Burst Out**
- **Key In (Currently inactive, it is for future use)**

Component In

- Provides standard Betacam inputs
- Reads VITC (Vertical Interval Timecode) input on Y

Component Out

- Provides standard Betacam outputs
- Provides timecode burn-in window on Y
- Provides VITC out on Y

S-Video (Y/C) Input

- Provides Y/C input
- Reads VITC (Vertical Interval Timecode) input

S-Video (Y/C) Out

- Provides Y/C output
- Provides timecode burn-in window
- Provides VITC out

Composite Out

- Provides composite output
- Provides timecode burn-in window
- Provides VITC out

Composite In

- Provides composite input
- Reads VITC input

LTC (Longitudinal Time Code) In

- Reads LTC input

LTC Out

- Provides LTC output

CSYNC (Composite Sync) Out

- Provides horizontal and vertical composite sync

Genlock In

- Composite sync or video input to synchronize the Elite's output to an external video source.

Black burst out

- Provides black burst output

Key In (for future use)

- Composite video input that is to be used for a key layer for S-Video and composite outputs.

Installing the Software

- **Insert the Producer_Install disk into the floppy drive.**

  An icon with the Applied Magic logo will appear on your Workbench.

- **Double-click the Producer_Install disk icon to open it.**

- **Double-click on the Install_Producer icon to begin the install process.**

- **The install routine will lead you through the install procedure with both installation disks.**

Producer Overview

Producer is the editing software for the Broadcaster Elite. With it you can:

- **Digitize video onto your hard drive as JStreams.**
  This just takes a few mouse clicks in the Recorder window.

- **Digitize audio onto your hard drive as audio samples** with a few more mouse clicks in the Recorder window. If you digitize audio along with video they will stay synchronized as you edit.

- **Log (divide) your JStreams and samples into Shots.**
  You can do this as you watch a JStream by hitting a key at the end of every shot.

- **Organize your Shots into Source Lists.**
  You can do this automatically by using the search tools or manually by simply dragging and dropping Shots into a Source List

- **Combine the Shots into Edit Decision Lists (EDLs) to create edited scenes.**
  This is also drag and drop, or you can use the equivalent keyboard shortcuts.

- **Fine tune your edits and add effects in the Timeline window.**
  A graphic user interface makes this a breeze, and effects are automatic.

- **Play the EDLs in sequence to see and hear your video in real time.**
  It's simple and fast, and you can even rearrange the EDLs to create alternate versions with different scene orders in just a few seconds.

Lets explore these concepts:

- **Projects**
- **JStreams**
- **Shots**
- **Source Lists**
- **Audio Samples**
- **Edit Decision Lists**
- **The EDL Timeline**

Projects

The highest level in Producer is the Project. When you load a Project, Producer will load all the Source Lists, JStreams, Samples, Shots, EDLs and Tags associated with that project. When you save a Project, Producer will save all the above items with that project.

You can import more JStreams or Samples, log them into Shots, create new Source Lists, and create new EDLs as you work on a Project.

JStreams

A JStream is one continuous piece of video that you digitized from a camera or video tape. Often that will be an entire tape that you shot, but it does not have to be.

JStream is short for "JPEG Video Stream." Without compression there would be no way to record real time, full resolution, field interlaced video to a hard drive. The Broadcaster Elite has powerful dedicated processor chips that compress video in real time using a form of JPEG compression. This special compression scheme, named after the Joint Photographic Experts Group (JPEG standard JPEG-9-R7) who standardized it within the industry, makes it possible to record the video onto a hard drive in real time. See Appendix C: JPEG Compression for a short description of

how JPEG compression operates.

With a fast SCSI II controller and hard drive, the Broadcaster Elite can digitally record video with very little visible loss in quality. The quality can be higher than analog video tape formats like Betacam SP, S-VHS, Hi-8, and 3/4SP depending on the compression amount you choose and the quality of your source footage.

Audio Samples

Audio Samples, when recorded with the SunRize AD516 hardware, are files of 16 bit, 44.1 kHz digital sound (standard CD quality). As audio does not have the data requirements of video, it is stored in an uncompressed format.

Shots

A Shot is a subset of the JStream or Audio Sample. You can divide a JStream (or Sample) into as many Shots as you want by using Producer's Logging feature or the Split feature. Unless you divide it, the entire JStream is a single Shot.

When you create a Shot, you're actually creating a record of where the beginning and ending of that Shot are in the JStream. Producer does not create a copy of that part of the JStream, it just keeps track of which part of the JStream you have defined as a particular Shot. This saves a lot of hard drive space.

Source Lists

A Source List is a list of Shots. They can be from the same JStream or from different JStreams. Once you have divided a JStream into Shots, you can use Producer's Tags Selector window to automatically generate Source Lists of similar Shots. Shots can also be manually sorted into Source Lists.

Typically you would use Source Lists to collect shots in related groups, like a Source List of narrator stand-up shots; a Source List of scenic shots; a Source List of exterior shots; a Source List of car crashes; a Source List of all the takes of one shot; or whatever organizational grouping makes sense to you for a particular Project.

This Shot-based organizational capability is more like traditional film editing than video editing. This allows you to easily find and keep track of your best Shots during the edit session.

EDLs

EDL stands for "Edit Decision List." This is the term used by video producers for a list of all the shots used to put together the video. The EDL is based on SMPTE timecode.

To create an EDL in Producer, all you have to do is drag and drop Shot names from any Source List into an EDL.

You can even copy Shot names from one EDL to another.

When you play back an EDL, all of the Shots contained within it will play from first to last.

There are several ways to use EDLs in Producer. You can drag all of the Shots you need for an entire video into a single EDL. Or you can use separate EDLs for different scenes in your video and then play all the EDLs in sequence when you want to view the finished video.

If you use the latter method, Producer makes it very easy to change the order of the EDLs to quickly rearrange the scenes in your video.

The Timeline

The Timeline gives you a graphic view of all of the Shots and Samples in an EDL. You can see them represented as horizontal bars. They can be easily dragged from left and right to trim the in points; trim the out points; and to move them to earlier or later points in time.

If you recorded audio and video together, they will stay in sync as you move them on the Timeline.

There are two video channels on the Timeline. If you put one Shot on one video channel and then overlap another Shot on the other video channel, Producer automatically creates a transition in the effects channel.

Producer's built-in transitions include dissolves, wipes, and slides. Producer can also use other software, like Art Department Professional and ImageFX to produce external transitions. You can create your own external transitions to do almost anything that you can imagine.

All of Producer's transitions are rendered; they do not happen in real time. However, once they are rendered they do play back in real time.

To get around the time it takes to render transitions, Producer takes advantage of your Amiga's preemptive multitasking operating system to let you render the transitions in the background while you continue editing your video. Until a transition is rendered, you will see a cut during playback. Once rendered, you will see the selected transition during playback.

You can also batch process your transitions so that they all render at once, either while you continue to edit or at any other time you want to render them; even overnight.

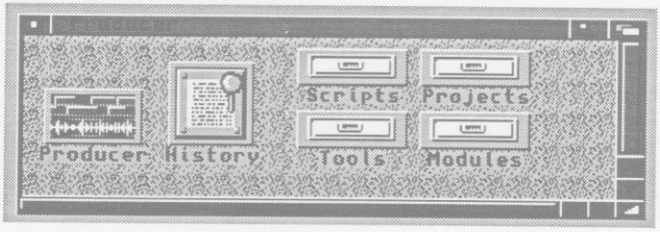
Producer Reference

This chapter will give you information about each menu command, interface window, and gadget in Producer. We will start with the Main Screen, followed by the menu commands and the interface windows.

One of Producer's strengths is that you can use either the mouse or keyboard shortcuts for most of its operations. At the end of the chapter you'll find a handy chart of all of Producer's keyboard shortcuts.

Running Producer

You might want to have Producer running so you can try its features as you read about them. To start Producer, double click the Producer Icon from the Workbench:

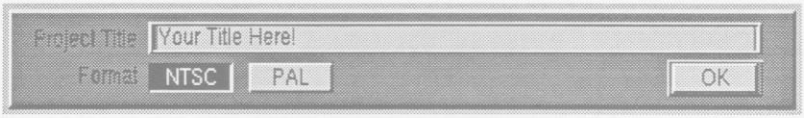


A status window will open on the Workbench screen showing the progress as the Broadcaster Elite is initialized, resources are allocated, and the SunRize AD516 board is initialized.

When the Producer screen is brought forward, you will be prompted as to whether you want to create a new Project or edit an old Project.

If you already have a Project you'd like to look at while you read this section, go ahead and load it by clicking the Edit Old button. You will see a standard file requester that will let you select the Project that you want to load.

If this is the first time you've run Producer, click the New button to start a new Project. You will see a requester where you can give your project a name and choose the video format for the Project.



You can give the Project any name you like by typing a name into the Project Title field. You can select to work in either the NTSC or PAL video standard for your project. The buttons will default to the setting, NTSC or PAL, of your Amiga. If you have the appropriate video equipment you can work in either format, but the Elite will not transcode between the two video standards. Finally, click the OK button to start the new Project.

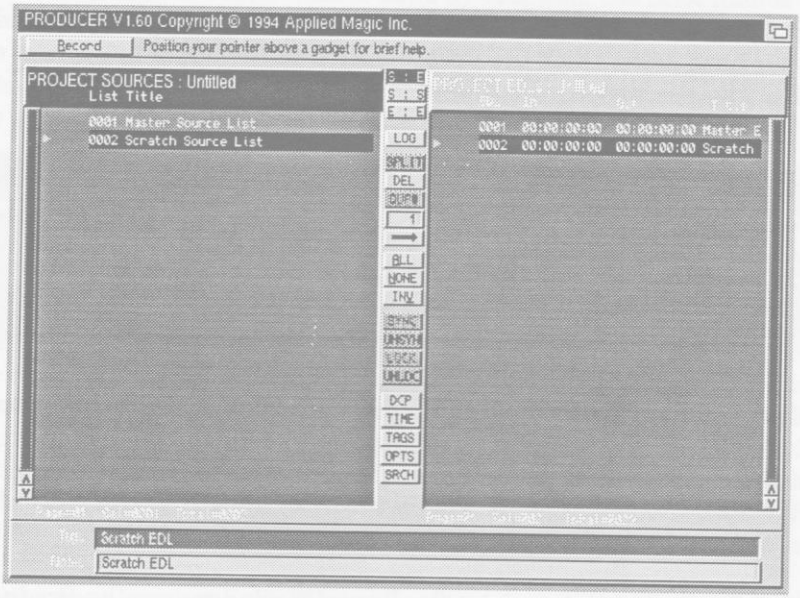
By the way, the new Project exists only in your computer's memory. If you want to keep it, save it to your hard disk with the Save As command. When you save a Project, Producer saves all the Source Lists, Edit Decision Lists, and Tags that you have created. Producer does not save any actual audio Samples or video JStream files with the project; these are saved to the hard drive when you digitize them. The Source Lists and Edit Decision Lists are pointers to that audio and video data already existing on the hard drive.

Producer will also keep track of other default information for you, including the current video path (the drive where new video will be recorded), the current audio path (the drive where new audio will be recorded), the screen mode, all the window positions, the Project path, and the Tags path. Producer saves all of this in a file called Config, inside a drawer

called Config, in the same drawer where Producer lives. This information gets saved when you quit Producer.

Main Screen

When you start Producer, the first thing you will see is Producer's Main Screen:



The Main Screen has two large Work Areas for viewing Sources or Edit Decision Lists (EDLs). Sources are the video, audio, and stills that you bring to the Project. EDLs are edited scenes that you can combine together to create your final video.

In between the Work Areas is a column of buttons that controls the Work Areas, lets you work with the Sources and EDLs, and lets you open interface windows.

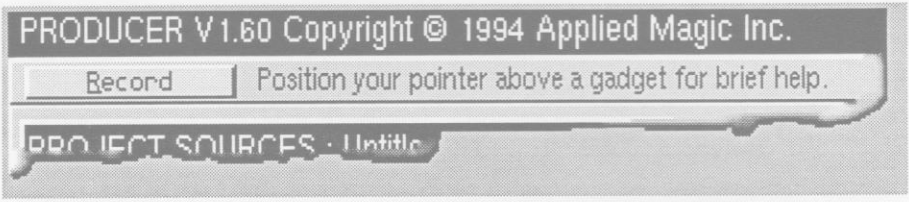
At the top left corner of the Screen is a button for opening the Recorder window, and beside it is the Help Area for reading about the buttons.

At the bottom of the screen is a button showing Tags for the currently selected Shot. Below it is a field for entering Notes for the current Shot.

Record Button

Keyboard shortcut: r

Before you can edit you'll need to record video (and optionally audio) to your hard drive. Click the Record button in the upper left corner of the Main Screen to open the Recorder window.



The Recorder window lets you record video and audio in real-time to your hard drive.

You can also open the Recorder window by selecting the Digital Recorder command in the Tools menu.

For more information about the Recorder window, see the Producer Interface Windows section later in this chapter.

Help Area

Immediately to the right of the Record button is the Help area. When you move the mouse pointer over any of the buttons on the Main Screen, you will see a brief description of the function of that button in the Help Area.

Work Areas

Most of the Main Screen is taken up by two columns, called Work Areas. Each Work Area can display Source Lists or Edit Decision Lists (EDLs). Source Lists show you the Shots available as you edit. EDLs are where you arrange the Shots into your final video.

The Work Areas make it easy to edit. All you do is choose Shots from Source Lists and copy them into Edit Decision Lists in the order you want to see them in your video. This is done by dragging the Shot names with the mouse, or with keyboard shortcuts.

Note: Once you have Shots arranged in EDLs, you can then use the Timeline window to fine tune each EDL in your video.

You can also copy Shots between Source Lists to organize them into categories. This makes it easier to find shots when you need them. Producer will even create new Source Lists for you automatically, based on the categories you set up with the Tags window.

When you start a new project, both Work Areas will be at the Project level. Here you will see Source Lists on the left and Edit Decision Lists on the right. Within the Source Lists Work Area, Producer will create both an empty Master and an empty Scratch Source List. Producer also creates empty Master and Scratch Edit Decision Lists in the EDL Work Area. You can use these lists if you like, and you can also create more lists for your Project.

You can change what each Work Area displays by clicking the S:S, S:E, or E:E button at the top of the column between the Work Areas.

The "S" stands for Source Lists, and the "E" stands for Edit Decision Lists. The S:S button puts Source Lists in both Work Areas. The S:E button puts Source Lists in the left Work Area and EDLs in the right Work Area. The E:E button puts EDLs in both Work Areas.

Only one Work Area is active at a time. The active Work Area is the one with the green bar at the top. To make a Work Area active, click in it.

You can also use the keyboard shortcuts: the Left Arrow key makes the left Work Area active and the Right Arrow key makes the right Work Area active.

Sources

Source Lists allow you see the Shots available to you as you edit. When you choose to have a Work Area show Sources, you can see them at two levels:

1. **Project Level**
   At the Project level you can see the names of all Source Lists that you have imported.

2. **Sources**
   At the Sources level you can see all of the Shots in a specific Source List.

It is very easy to switch between the Project level and the Sources level. From the Project level, double click the name of a Source list to see all of the shots in that list. To see the Project Level again, click the bar at the top of the Work Area.

How It Really Works

When you record video, Producer creates a JStream file onto the hard drive. When you record audio, Producer records an audio Sample onto the hard drive.

Producer then lets you create "pointers" to that data in the form of Source Lists, Shots, Samples, and Edit Decision Lists. Producer lets you log a JStream into individual Shots, copy Shots into Shot Source Lists, and copy shots into Edit Decision Lists. As you do so, Producer creates a database that keeps track of your Shots. It knows the exact location where the JStreams and audio Samples are stored on the hard drive.

When you play back one or more EDLs, Producer finds the original video segments in the original JStream files and the original Samples in the original audio files and plays them back in the order designated by your EDLs. Each time you play your video, Producer uses the edit decisions

made when creating your EDL (Edit Decision List) and creates the entire video in real time from your source data!

The beauty of this system is that it's all automatic. You do not have to think about the original data once it has been digitized. All you have to do is drag and drop and build your EDLs, and Producer creates your video in real time each time you play it.

Importing JStream Files and Audio Samples

Before you can edit anything you must have video and audio on your hard drives and available in the Work Areas within your current Producer Project.

You can add JStreams and Samples to the Project by recording them with the Recorder window. You can import already recorded JStreams and Samples into the Project with the Import menu commands.

Note: All the JStreams in a Project must be recorded at the same quality level. This includes any JStreams you make from imported animation frames.

Creating Shots

In Producer, a JStream looks like a Source List with one Shot in it. You can use Producer's Logging feature or the Split button to divide it into more Shots.

Source Lists

Source Lists can contain any number of Shots. They are similar to Source Lists in traditional film editing.

A Source List can be a list of all the Shots logged from a single JStream, or a combination of Shots from several JStreams.

When you first record a JStream with the Recorder window, it will show up as a Source List with a single Shot in it. It will also have one or two audio Shots if you recorded audio at the same time.

To create empty Source Lists, simply make a Source Work Area active and then use the New command in the Edit menu.

Shots can also be manually sorted into Source Lists by using your mouse to drag shots from any Source List in one Work Area into any Source List in another Work Area. The Tab key allows you to copy Shots and Samples between lists.

You need to be looking at Sources in both Work Areas to do this. Clicking the S:S button between the Work Areas on the Main Screen allows you to show Sources in both Work Areas. Then double click the Source List you want to copy from in the left Work Area, and the Source List you want to copy to in the right Work Area.

Note: When you copy a video Shot that is synced to one or more audio Shots, the audio will also be copied to the new list. When you copy a Shot of audio that is synced to video, the video Shot will also be copied to the new list.

Dragging a Shot with the mouse and releasing it in a new position in the list rearranges the order of the Shots in a Source List .

You can use the Tags Selector window in Producer to automatically create Source Lists of shots that share a common trait, like a Source List of scenic shots, a Source List of your best takes from a particular scene, or whatever you want.

Edit Decision Lists

Edit Decision Lists (EDLs) are lists of Shots that you've combined to create edited scenes. Typically you will use more than one EDL when you create a video. With each EDL holding the shots for a different section of the video, you can then play back a series of EDLs to watch your video.

EDLs in a Work Area can be seen at two levels:

- **Project Level**
  At the Project level you can see a list of all the EDLs available in the current Project. The order in which you arrange them from top to bottom determines the order in which they will play back. To play them back, select the ones you want to see and press the 6 key on your numeric keypad.

- **EDL Level**
  Double click the name of an EDL to see all the Shots available within it.

  To see the Project Level again, click the bar at the top of the Work Area.

Edit Decision Lists can have any number of Shots.

Manually put Shots from Source Lists into Edit Decision Lists by dragging them with your mouse from any Source List in the left Work Area into an EDL in the right Work Area. You can also use the Tab key to copy Shots between lists.

You need to be looking at Sources in the left Work Area and EDLs in the right Work Area to do this. Click the S:E button between the Work Areas to accomplish this. Then double click the Source List you want to copy from in the left Work Area, and the Edit Decision List you want to copy to in the right Work Area.

As you copy Shots into an EDL, you actually create a scene for your video. The video will play the Shots in order from top to bottom. You can rearrange the order of the Shots by clicking and dragging a Shot with the mouse and releasing it in a new position in the list.

With the EDL Timeline window open when you are at the EDL level, you see a graphic representation of the current EDL. You can fine tune the scene and add video transitions by manipulating graphic elements in the Timeline.

Note: When you copy a video Shot that is synced to one or more audio Shots, the audio will also be copied to the new list. When you copy a Shot of audio that is synced to video, the video Shot will also be copied to the new list.

Selecting Shots

To select a Shot in a list, click it once. It becomes highlighted to show that it is selected.

Multiple Shots can be selected by clicking on the first one, holding the shift key down, then clicking on the remaining Shots. Or drag-select by holding the shift key and the left mouse button down, and dragging the mouse pointer over the Shots that you want to select.

Click the ALL button to highlight all Shots in the active window. The keyboard shortcut is "A".

Click the NONE button to un-highlight all entries in the active window, except the currently selected one. The keyboard equivalent is "N".

Click the INV button to invert all entries in the active window. This highlights all un-highlighted entries, and un-highlights all highlighted entries, except the currently selected one. The keyboard shortcut is "V".

Tags Line

The Tags display shows the Tags belonging to the currently selected Shot. Tags are a quick way of labelling a Shot, and you can also use them to automatically create Source Lists of similar Shots.

Notes Field

This field shows the note belonging to the currently selected Shot. You can type the note for the Shot directly into this field. Also use the Notes field for any kind of description you want, up to 64 characters.

Center Controls

In between the Work Areas you see a column of buttons for often used functions. They make it easy to edit with your mouse. Most of these functions have keyboard shortcuts as well.

S:S, S:E and E:E Buttons

There are three buttons that let you choose what the Work Areas are displaying. The "S" stands for Source, and the "E" stands for EDL.

S:S Button

Keyboard shortcut: none

The S:S button puts Sources in both Work Areas. This makes it easy to copy Shots from Source Lists on one side into other Source Lists on the other to better organize your Shots.

S:E Button

Keyboard shortcut: none

The S:E button puts Sources on the left Work Area and EDLs on the right Work Area. This makes it easy to copy Shots from Source Lists on the left side into Edit Decision Lists on the right side. This is how you edit scenes together.

Note: You can fine tune your EDLs and add transitions with the Timeline window.

E:E Button

Keyboard shortcut: none

The E:E button puts Edit Decision Lists in both Work Areas. This makes it easy to copy shots from one EDL to another.

LOG Button

Keyboard shortcut: Right-Amiga L

Click the Log button to turn on Logging Mode. Logging Mode lets you break up a JStream into multiple Shots.

When you record video, Producer shows the entire JStream as a single shot within a Source List. Use the Logging Mode to break it up into multiple Shots.

Note: This will not affect the data on your hard drive, it just adds pointers to that data from within your Project database. The Shots you edit within Producer are entries in Producer's database for the current project. Producer uses that database internally to create your video from the original JStreams and Samples on your hard drive each time you play the video. If this sounds complicated, don't worry about it - it's all automatic.

How To Use Logging Mode

Click the Log button to turn on Logging Mode. Now play the JStream you want to log by selecting it in the Work Area and hitting the 6 key on the numeric keyboard.

As you watch the JStream, hit the minus "-" key on the numeric keypad (or the Out button on the Digital Control Panel) to mark an out time at the end of each Shot you want to Log. Producer will end the current shot and start a new one.

You can also scan through the JStream using the Digital Control Panel and mark an out time anywhere you want the current Shot to end and a new one to begin.

If there is audio associated with the video, the audio Shot will stay with the video Shot as you log them.

Do not worry about being very exact when Logging Shots. In fact, you will want to make sure to leave enough slack at the beginning and ending

of shots so you have room to make adjustments later when you trim your Shots in the EDL Timeline.

Once you have broken up a JStream into Shots, you can move the shots into other source lists to organize them. You can do this manually by dragging them, or automatically with the Tag Selector window. Or if you prefer, you can also move logged Shots directly into EDLs.

Logging your footage and organizing Shots into Source Lists will make you better organized. Being better organized will help you to make sure that the best Shots end up in your final video.

SPLIT Button

Keyboard shortcut: Right-Amiga /

The SPLIT button lets you divide any Shot into two Shots. There are two ways to do it. If you split the Shot from the Work Area, it automatically splits exactly in the middle. If you split it from the EDL Timeline, you can choose exactly where the split will occur.

Splitting A Shot In The EDL Time Line Window

If you select a Shot on the EDL Timeline window, the SPLIT button will cut it into two Shots at the location of the Timeline cursor. Before you split the shot, you can drag the Timeline cursor to the frame where you want the new Shot to begin.

This is very useful for insert editing. You can SPLIT a Shot, trim the out point of the new first shot and the in point of the new second shot to make a space, and then drag another shot into that space. If the Shot is part of a synced audio-video pair, you can split only the video by making sure that only the video shot is highlighted when you click the SPLIT button. The audio Shot will remain intact and maintain sync with both of the resulting video Shots.

For example, if you had an interview shot of a person talking, you could split it into two shots, make room for a cutaway, and then insert the cut-

away shot. When you play back the EDL you'll see the person talking, see the cutaway shot but still hear the person's voice continuing under the cutaway, and then see the person talking again. The talking is all from the original Shot and it stays in sync with both of the new Shots.

Splitting A Shot That's Not In The EDL Time Line Window

If you select a shot in a Source List, the SPLIT button will cut the Shot exactly in half. This is another way to divide a Shot into multiple Shots, but using the Log button (see above) allows you to do this with greater control and accuracy.

If you select a shot in an Edit Decision List, normally it will also be selected in the Timeline. The SPLIT button will split it at the location of the Timeline cursor. But if the Timeline window is not open, the SPLIT button will split it exactly in half.

DEL Button

Keyboard shortcut: Right-Amiga D

The DEL button lets you remove Shots, entire Source Lists or entire Edit Decision Lists from the current Project. To use it, select the entries you want to remove and click the DEL button.

Warning: This will not erase any of the actual JStream or Sample data stored on your drives. But if you use the DEL button on a Source List or an Edit Decision List, you will lose those lists forever.

DUP# Button

Keyboard shortcut: Right-Amiga Z

The DUP# button lets you duplicate Shots. First, select the Shots you want to duplicate. Then in the DUP Field (see below), enter the number of times you want them duplicated. Finally, click the Dup # button.

The Selected Shots will be duplicated within the current Source List or Edit Decision List.

Note: Shots are pointers to the actual JStream (video) and Sample (audio) data on your hard drive. When you duplicate Shots, Producer creates new pointers to the already existing data and adds these pointers to the current Source List or Edit Decision List within the Project database. Producer does not duplicate the actual data on your hard disk. This is good because it saves disk space. It's also automatic so all you have to worry about is how your video looks, while Producer does all the database management work behind the scenes.

DUP Field

The DUP Field lets you specify how many times selected Shots will be duplicated when you click the DUP # button (see above).

Copy Button (----->)

Keyboard shortcut: TAB

The Copy button lets you copy one or more Shots from the left Work Area to the right Work Area.

Select the Shots in a Source List or Edit Decision List in the left Work Area. Then click the Copy button ---> to copy them to the current Source List or Edit Decision List in the right Work Area.

You can also use the mouse to drag any number of Shots from one Work Area to the other.

ALL

Keyboard shortcut: a

Click the ALL button to select all the entries in the active Work Area.

If the Active Work area is at the Project level, when you click the All button you will select all the names of the Source Lists or Edit Decision Lists in the Work Area.

If the Active Work Area is at the Source or EDL level, when you click the All command you will select all the Shots in the current Source List or Edit Decision List.

NONE

Keyboard shortcut: n

Click the NONE button to un-highlight all entries in the active Work Area except the currently selected one.

INV

Keyboard shortcut: v

Use the INV button to invert all entries in the active Work Area. All un-highlighted entries will be highlighted and all highlighted entries will be un-highlighted, except the currently selected one.

SYNC

Keyboard shortcut: s

The SYNC button lets you keep multiple Shots together in a group. You can use it to keep video and audio Shots synchronized.

For example, use it to keep video of someone talking in sync with the corresponding audio. You can do this even if the sound was recorded at a different time if you first get them aligned in the EDL Timeline. Then when you Sync them they will stay together in the same alignment even if you move one of them.

When you record audio and video together, Producer automatically syncs them as if they were selected and the SYNC button used.

When you move any one of the members of a synced group, all of the other members will follow. For example, if you move a synced video Shot from a Source List into an Edit Decision List, the synced audio Shot will follow automatically.

You can also use the SYNC button to make groups of Shots stay together as a single entity when you move them. This is useful when you have a section of your EDL that is edited, but you want to move that section later in the EDL. Move any one of the members of the synced group and all the other members will follow automatically.

To select multiple entries, click the first one, hold the shift button, and then click the remaining entries. Click the SYNC button to group them all into a single entity. Synced Shots have a red "S" next to them in Source Lists and Edit Decision Lists.

You can Sync Shots in any combination either in a Work Area on the Main Screen or in the EDL Timeline window.

UNSYN

Keyboard shortcut: none

Use the UNSYNC button to unlink the selected clip from the others in a synced group (see above). Once you Unsync a Shot, you can then move it separately in a list or on the EDL Timeline.

LOCK

Keyboard shortcut: none

The LOCK button temporarily locks a Shot to a particular position on the Timeline. Locked Shots are indicated by an "L".

UNLOC

Keyboard shortcut: none

The UNLOCK button frees a locked Shot.

DCP

Keyboard shortcut: F6

Click the DCP button to open the Digital Control Panel window. The Digital Control Panel window gives you a graphic interface for playing Shots, or one or more EDLs; for adjusting the in and out points of Shots in either Source Lists or EDLs; and for setting the key frame of a Shot.

Most of the gadgets in the Digital Control Panel window also have keyboard shortcuts using keys on the numeric keypad.

For more information about the Digital Control Panel window, see the section on Producer Interface Windows later in this chapter.

TIME

Keyboard shortcut: F8

Click the Time button to open the EDL Timeline window. This window gives you a comprehensive graphic user interface for editing and adding transition effects to the currently selected EDL.

For more information about the EDL Timeline window, see the section on Producer Interface Windows later in this chapter.

TAGS

Keyboard shortcut: F9

Click the TAGS button to open the Tags Selector window. The Tags Selector window gives you an interface for tagging the active Shot with key words within categories that you set up. Using these keywords, the Tags Selector window can then automatically generate Source Lists of shots that share any set of characteristics that you specify.

For more information about the Tags Selector window, see the section on Producer Interface Windows later in this chapter.

OPTS

Keyboard shortcut: F10

Click the OPTS button to open the Editor Display Options window. The Editor Display Options window lets you control what information you see in the Work Areas.

For more information about the Editor Display Options window, see the section on Producer Interface Windows later in this chapter.

SRCH

Keyboard shortcut: none

Click the SRCH button to open the Search Options window. The SRCH Options window lets you set the criteria for automatically generating Source Lists, if you're at the Project level, or selecting matching Shots if you're at the Sources or EDL level of a Work Area.

For more information about the Search Options window, see the section on Producer Interface Windows later in this chapter.

Menus

Producer has four drop down menus:

- **Project**
  Ten commands for opening, saving and renaming projects; choosing a screen mode; exporting a CMX edit decision list; seeing the version numbers of Producer and your Broadcaster Elite; and quitting Producer.

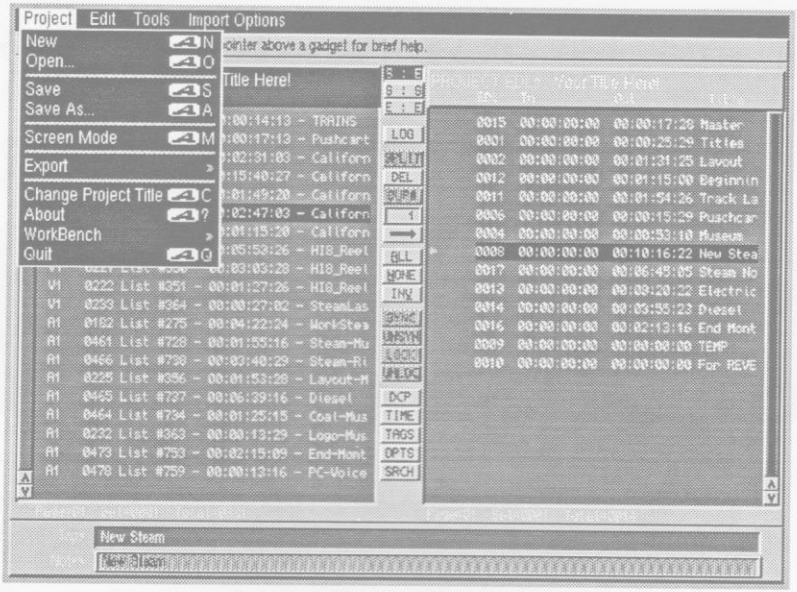
- **Edit**
  Fourteen commands for adding new Source Lists and Edit Decision Lists; adding comments to the Work Area; getting information about JStreams, Samples, Source Lists, Edit Decision Lists, and Shots; and Logging, Splitting, Deleting, Duplicating, Moving, Marking, Locking, and Syncing Shots.

  Note: Many of these commands are also available from the buttons between the Work Areas of the Main Screen.

- **Tools**
  Ten commands for opening various Producer Interface Windows and for converting all the shots in an EDL into a single JStream.

- **Import Options**
  Seven commands for importing video, audio and stills.

Most of these commands have keyboard shortcuts. Some of them are also duplicated by the buttons in the upper left corner and the center column of the Editing Screen.



The Project Menu

The Project menu has ten commands:

- **New**
  Lets you start a new project

- **Open**
  Lets you open an existing project

- **Save**
  Lets you save the current project

- **Save As...**
  Lets you save the current project under a different name without erasing the last saved version of the project.

- **Select Screen Mode**
  Lets you choose the type of screen on which to run Producer.

- **Export**
  Lets you save a CMX format edit decision list.

- **Change Project Title**
  Lets you rename the current project.

- **About**
  Lets you find out the serial number of your Broadcaster Elite card, the version number of Producer, and the phone and fax numbers for Applied Magic.

- **Workbench**
  Lets you toggle the Workbench screen on and off.

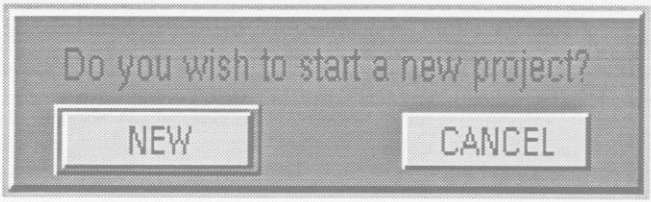
- **Quit**
  Lets you exit Producer.

New

Keyboard shortcut: Right-Amiga n

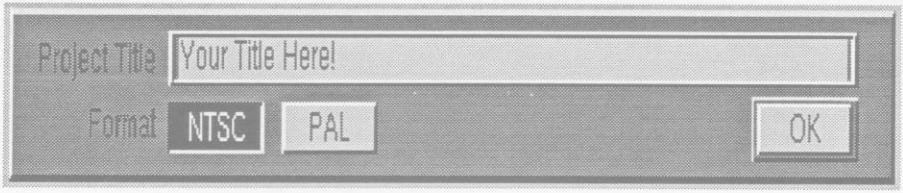
Select the New command to clear the current project and begin a new Project. A Project includes Source Lists, Edit Decision Lists, and Tags. A Project does not include any actual audio Samples or video JStream files. The Source Lists and Edit Decision Lists are pointers to existing audio and video data.

When you choose the New command, Producer will ask you if you want to start a new Project:



Click the Cancel button if you changed your mind and don't want to start a new Project.

Click the New button if you do want to start a new Project. You will see the Project Requester:



Type a name for your new project in the Project Title field. Click either the NTSC or the PAL button to select either video format to use for the new project. Then click the OK button to start your new project.

Once you've started a new Project you can record new JStreams and audio Samples using the Record window, or you can import existing JStreams and audio Samples using the commands in the Import menu. You can translate animation frames into JStreams using ADPro and the Frames2JST ARexx script (included with Producer), and then import them using the commands in the Import menu. When you record new JStreams and Samples, the actual JStream and audio Sample data do not become part of the Project file. The Shots, Source Lists and Edit Decision Lists that make up a Project refer to the JStream and audio Samples on your hard disk. They are the directions Producer uses to find the segments of video and audio that make up your Shots.

Note: Remember that all the Video within a Project must be recorded at the same quality level. The Broadcaster Elite cannot edit together video of differing quality levels. This applies to recorded JStreams and animations translated into JStreams.

Open

Keyboard shortcut: Right-Amiga o

Select the Open command to load an existing project. A Project includes Source Lists, Edit Decision Lists, and Tags. A Project does not include any actual audio files or video JStream files. The Source Lists and Edit Decision Lists are pointers to existing audio and video data.

When you choose the Open command, you will see a standard Amiga file requester. Use it to choose the file you want to open. Producer will then load a Project.

By default, projects are kept in your Producer:Projects drawer.

Save

Keyboard shortcut: Right-Amiga s

Select the Save command to save the current Project to your disk. When you save a Project, Producer saves a database of all the Source Lists, Edit Decision Lists, and Tags that you've created. Producer doesn't save any actual audio Samples or video JStream files; you save those to the hard drive when you digitize them. The Source Lists and Edit Decision Lists are directions that tell Producer where to look to use that existing audio and video data.

When you save a Project, it will replace the file created the last time you saved that Project. Producer will also automatically save the transition script file for batch processing of the transitions in the Project.

If you haven't yet saved the Project, the Save command triggers the Save As command instead.

Save As

Keyboard shortcut: Right-Amiga a

Select the Save As command to save a Project for the first time, or to save a project under a new name in order to keep the old version of the Project intact.

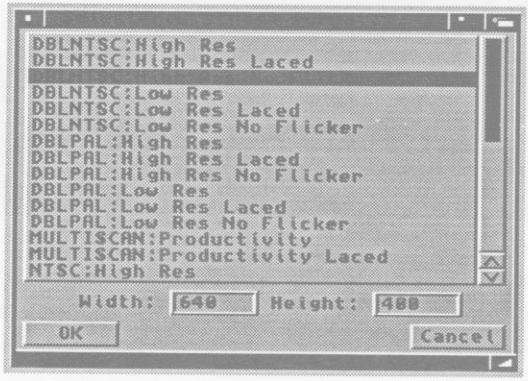
The Save As command opens a standard Amiga file requester where you can choose a path and name for the Project file. Click OK to save the Project in the path you chose and under the name you typed.

Producer will also automatically save the transition script file for batch processing of the transitions in the Project when you save a Project file using the Save As command.

Screen Mode

Keyboard shortcut: Right-Amiga m

Select the Select Screen Mode command to choose a different screen mode for Producer's editing screen. You'll see the standard Amiga screen mode requester showing all the screen modes available on your Amiga. If you have a graphics card, you should see its screen modes listed along with the native Amiga screen modes:



Double click the name of a screen mode from the list, or click a name once and then click the OK button. Producer will open on the new screen.

Export

Keyboard shortcut: none

Select the Export command when you want to export the current EDL in a standard EDL format. You will see a submenu listing EDL output formats. Currently only CMX is available.

Select the CMX command in the submenu to export the current EDL as a CMX list. You'll see a standard Amiga file requester. Use it to find the directory where you want to save the list; enter a name for the list; and click the OK button. Producer will save a standard ASCII format CMX list.

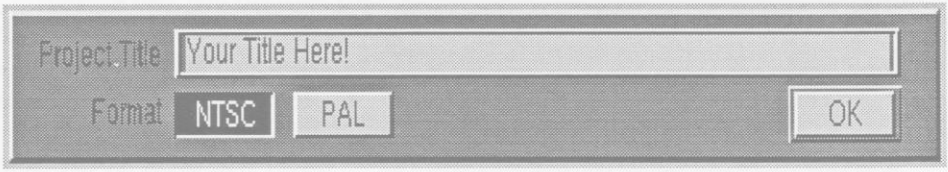
The current version of Producer exports cuts-only CMX lists. Transitions are not supported in the CMX lists. Also, there is currently no support for drop frame time code in Producer.

To export multiple EDLs and combine them into a single EDL, you can export them individually and then combine them in a text editor.

Change Project Title

Keyboard shortcut: Right-Amiga t

Select the Change Project Title command to change the title of the current Project. You'll see the Project window.



Type in a new title and click the OK button. The new Project name will appear at the top of both columns on the Editing Screen when you look at the available Source Lists or available EDLs.

This does not change the name of the Project file on your disk. To do that, use the Save As command in the Project menu.

About

Keyboard shortcut: Right-Amiga ?

Select the About command to see a window with information about Producer and your Broadcaster Elite. You'll see the software version number and the serial number of your card:

Should you have any trouble with your Broadcaster Elite system, the Applied Magic tech support team will want to know these numbers from your system.

Workbench

Keyboard shortcut: none

Select the Workbench command to see a submenu with commands for opening and closing the Workbench screen. If you are low on memory, select the Close command in the submenu to close the Workbench screen and free up the memory it was using. If you want to reopen the Workbench screen, select the Open command from the submenu.

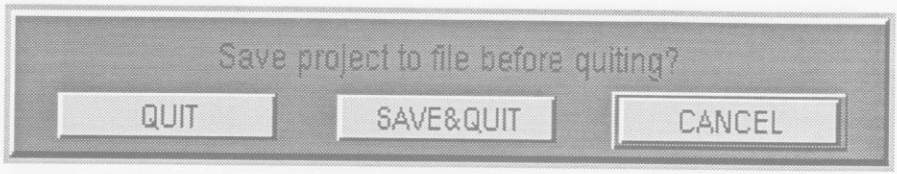
Note: You can only close the Workbench screen if there are no programs running on it.

If you are low on memory it helps to close any other programs you might have open. You can see the amount of available memory at the top of the Workbench screen. If you are short on memory, you can add more RAM, run fewer programs, or, if need be, close the Workbench screen.

Quit

Keyboard shortcut: Right-Amiga q

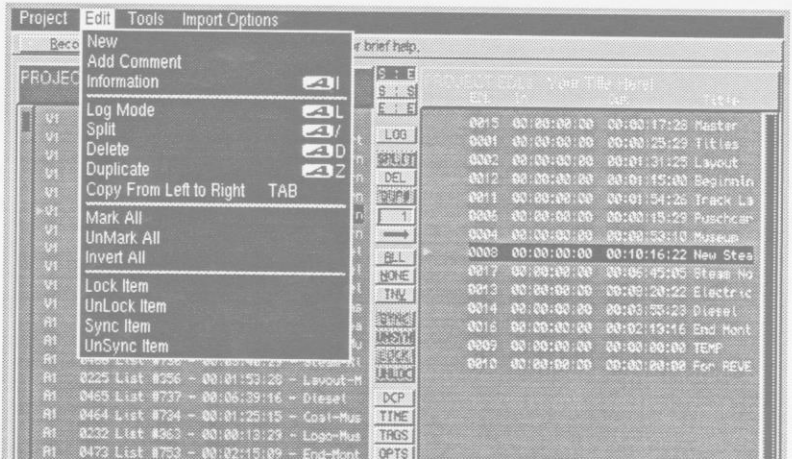
Select the Quit command to close Producer. You will see a requester that asks if you want to save the current project.



The Save & Quit button allows you to save the project and close the program. You can click the Quit button to quit without saving; or click the Cancel button to close the program without saving the current project.

Warning: If you close the program without saving the Project, all of the changes that you made since the last time you saved will be lost forever!

The Edit Menu



The Edit menu has 15 commands:

- **New**
  Lets you add a new Source List if the current Work Area is a Sources Work Area, or a new Edit Decision List if the current Work Area is an EDL Work Area.

- **Add Comment**
  Lets you add a comment line to a Source List, EDL List, or Shot.

- **Information**
  Lets you see information about the currently selected Source List, Edit Decision List, Shot, or Transition.

- **Log Mode**
  Lets you divide a Shot into multiple Shots. This is very useful for dividing a long piece of digitized video or audio into its component Shots for editing.

- **Split**
  Lets you divide a Shot into two shots. This is very useful on the EDL Time Line window for creating a gap where you can insert cutaway video.

- **Delete**
  Lets you remove a Source List, EDL or Shot from the Project. This will not delete the original JStream or audio Sample file.

- **Duplicate**
  Lets you make a copy of a Shot in a List. This does not actually make a new copy of the original JStream video file or the audio Sample.

- **Copy**
  Lets you copy any selected Shot in the left Work Area to the current Edit Decision List shown in the right Work Area.

- **Mark All**
  Lets you select all the Source Lists, Edit Decision Lists or Shots in the current Work Area.

- **Unmark All**
  Lets you deselect all but one of the Source Lists, Edit Decision Lists or Shots in the current Work Area. The remaining selected entry will be the one that was marked with the red pointer in the Work Area.

- **Invert All**
  Lets you select all unselected entries and unselect all selected entries in one step.

- **Lock Item**
  Lets you lock all selected Shots to their current position on the EDL Timeline.

- **Unlock Item**
  Lets you unlock locked Shots.

- **Sync Item**
  Lets you group two or more Shots together so when you move one, the other(s) move with it and they all stay in sync.

- **Unsync Item**
  Lets you ungroup any selected Shots that were synced in a group.

New

Keyboard shortcut: none

Adds new EDL to EDL Work Area or Source List to Source Work Area.

Add Comment

Adds a comment line to a Source List, Edit Decision List or Shot.

Information

Keyboard shortcut: Right-Amiga i

Displays information on the currently selected Source List, Edit Decision List, Shot or Transition. The information displayed depends on the type of item selected. All items will have the title, data-type, in & out-times, duration, usage count, status and filename. For JStreams you can look here to see the average frame size, the minimum data rate for playback and the mean compression ratio of the frames in the JStream. For transitions, the A & B sources are listed along with frame offsets.

The information display for audio Samples adds four additional slider gadgets for setting the volume and pan of the left and right channels.

Log Mode

Keyboard shortcut: Right-Amiga l

Operates the same as the [LOG] button

Split

Keyboard shortcut: Right-Amiga /

Operates the same as the SPLIT button.

Delete

Keyboard shortcut: Right-Amiga d

Operates the same as the DEL button.

Duplicate

Keyboard shortcut: Right-Amiga z

Operates the same as the DUP button.

Copy From Left To Right

Keyboard shortcut: Tab

Operates the same as the [--->] button.

Mark All

Keyboard shortcut: a

Operates the same as the ALL button.

Unmark All

Keyboard shortcut: n

Operates the same as the NONE button.

Invert All

Keyboard shortcut: none

Operates the same as the INV button.

Lock Item

Keyboard shortcut: none

Operates the same as the LOCK button.

Unlock Item

Keyboard shortcut: none

Operates the same as the UNLOC button.

Sync Item

Keyboard shortcut: none

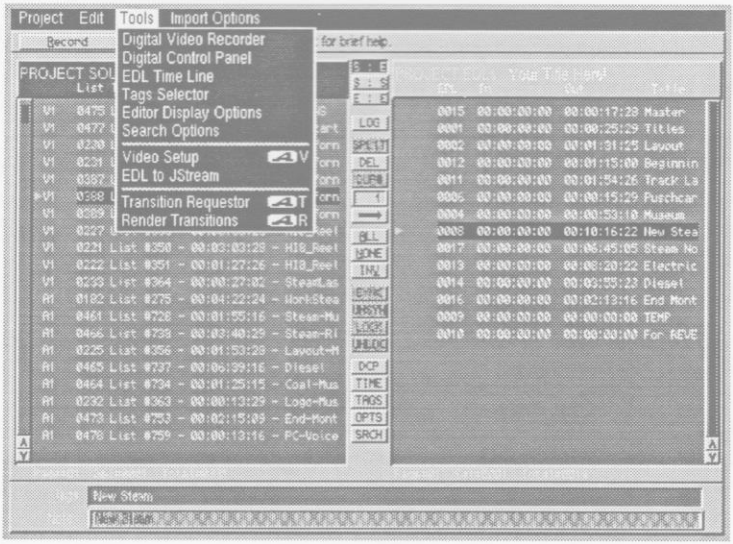
Operates the same as the SYNC button.

UnSync Item

Keyboard shortcut: none

Operates the same as the UNSYN button.

The Tools Menu



The Tools menu has 10 commands:

- **Digital Video Recorder**
- **Digital Control Panel**
- **EDL Timeline**
- **Tags Selector**
- **Editor Display Options**
- **Search Options**
- **Video Setup**
- **EDL To JStream**
- **Transition Requester**
- **Render Transitions**

Digital Video Recorder

Keyboard shortcut: r

Operates the same as the RECORD button.

Digital Control Panel

Keyboard shortcut: F6

Operates the same as the DCP button.

EDL Time Line

Keyboard shortcut: F8

Operates the same as the TIME button.

Tags Selector

Keyboard shortcut: F9

Editor Display Options

Keyboard shortcut: F10

Operates the same as the OPTS button.

Search Options

Keyboard shortcut: none

Operates the same as the SRCH button.

Video Setup

Keyboard shortcuts: Right-Amiga v and F7

Opens the Video Setup Window for setting the parameters of the time-code burn-in window and enabling/disabling external sync.

The Video Setup window controls the timecode burn-in window, timecode output and external sync.

Timecode Monitor

ON/OFF - Turns the timecode burn-in window on or off.

The Broadcaster Elite does not require you to select an output type. However, in early revisions of the Broadcaster hardware, the burn-in window could only appear on one of the following three outputs:

- **Composite Video**
- **S-Video**
- **Component Video**

A square box fills the center section of the window and contains a smaller rectangle that can be dragged around the larger box to place the burn-in window in your output.

LTC

Select either to Write LTC to the LTC out jack, or None.

VITC

Select either to Write VITC onto the outgoing video, or None.

External Sync

Enable or disable syncing to incoming video.

EDL To JStream

Keyboard shortcut: none

Converts the various video Shots on the current EDL to a single JStream. You will be prompted to select a name for the JStream and to select the drive on which to create it. Note the predicted file size and make sure you have enough room on the drive.

To create the new file, EDL to JStream extracts only the frames being used from the existing JStreams. This allows you to delete the old JStreams which likely contain a lot of unused footage.

If you are experiencing a problem playing back highly edited footage (looping), using EDLtoJStream will often correct the problem as it creates a single file, reducing or eliminating hard drive head seeks.

Note: The EDLtoJStream operation requires that you have sufficient hard drive space available, the same amount as used by your current project. Ideally this should be done on a newly Quick Formatted partition or additional drive.

Transition Requester

Keyboard shortcut: Right-Amiga t

This menu selection opens the Transition Requester allowing you to select the transition type for your video transitions.

See the Producer Interface Windows section later in this chapter for more information.

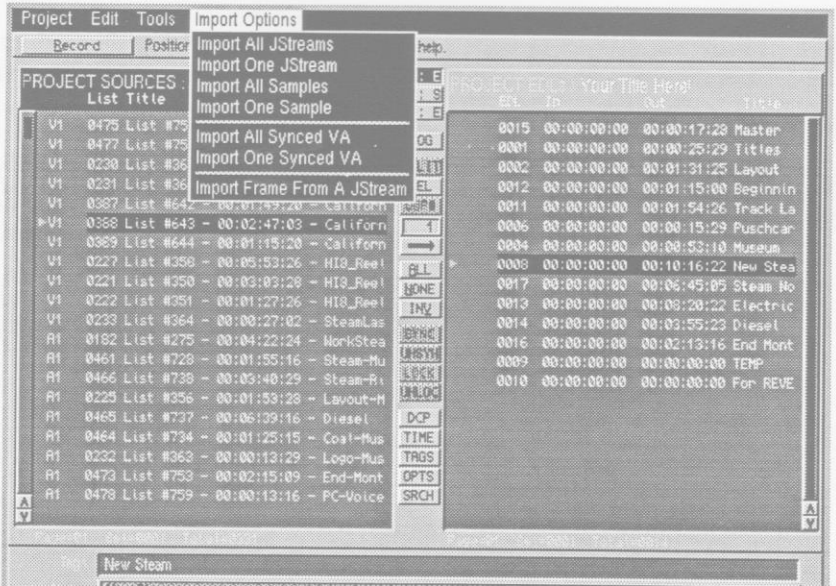
Render Transitions

Keyboard shortcut: Right-Amiga r

This menu selection opens the Render Transitions Requester allowing control over the transition rendering process.

See the Producer Interface Windows section later in this chapter for more information.

The Import Options Menu



The Import Options menu has 7 commands:

- **Import All JStreams**
- **Import One JStream**
- **Import All Samples**
- **Import One Sample**
- **Import All Synced VA**
- **Import One Synced VA**
- **Import Frame From A JStream**

Import All JStreams

Keyboard shortcut: none

Import all JStreams from the selected hard drive into the Sources Work Area.

Import One JStream

Keyboard shortcut: none

Import one JStream from the selected hard drive into the Sources Work Area.

Import All Samples

Keyboard shortcut: none

Import all audio Samples from the selected hard drive into the Sources Work Area.

Import One Sample

Keyboard shortcut: none

Import one audio Sample file from the selected hard drive into the Sources Work Area.

Import All Synced VA

Keyboard shortcut: none

Import all synced video-audio pairs from the selected drive. Synced video-audio pairs refers to the video JStreams and audio Sample files created when you record video and audio simultaneously.

Import One Synced VA

Keyboard shortcut: none

Import one synced video-audio pair from the selected drive.

Import Frame From A JStream

Keyboard shortcut: none

Import a single frame or field from a JStream as a single Shot in a Source List. You'll see a requester asking you to select the specific frame to import. You can choose to import both fields or only the first.

The selected frame (or field) will be imported as a one second Shot into the current Source List. This can be placed on the Timeline like any other Shot.

Note: Imported frames will only work with internal transitions. They won't work with external transitions.

Producer Interface Windows

In addition to the Main Screen, there are a number of control windows you can open that give you useful controls and functions. More than one of these control windows may be open at one time.

Note: When you have more than one window open, you may need to put one window behind another. Click the button in the upper right corner of each window to bring that window to the front if it is not already there, or move it to the back of all other interface windows if it is already in front. If you hold the shift key when you click this button the window will move to the back regardless of its present level. Pressing the hotkey for one of the control windows while it is open will cause it to be closed.

Recorder Window

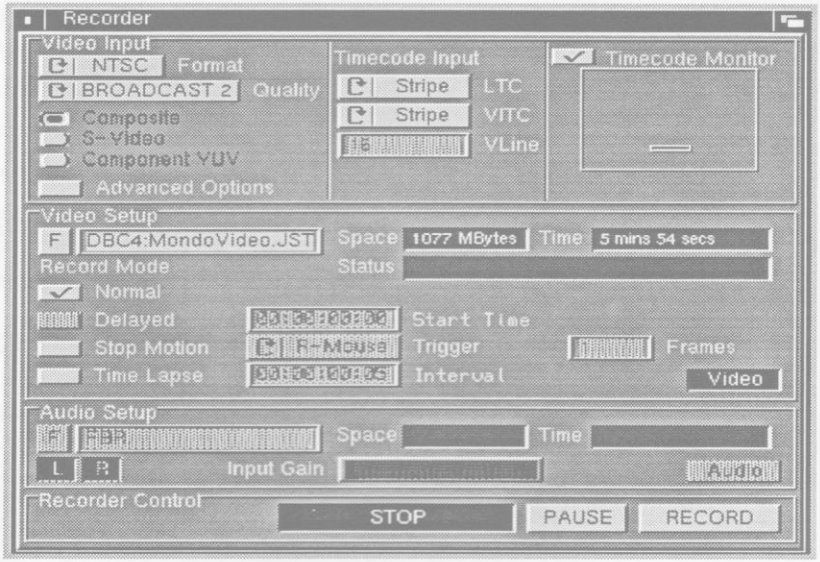
Before you can edit video and audio you need to record it onto your hard drive.

The Recorder window lets you record video and audio in real-time to your hard drive. The Broadcaster Elite stores video as JStream (JPEG stream) files, and audio in the SunRize_2.0 file format. You can import these video and audio files into Producer for editing.

To open the Recorder window, select the Digital Recorder command in the Tools menu or click the Record button in the upper left corner of the Editing Screen, or hit the hotkey for the Recorder window: "r".

The Recorder window has four sections:

- **Video Input**
- **Video Setup**
- **Audio Setup**
- **Recorder Control**



Video Input

The Video Input section controls the video input and settings for the recording process. Controls are as follows:

- **Input Format**
- **Quality Level**
- **Video Input**
- **Advanced Options**
- **LTC Control**
- **VITC Control**
- **VLine Selection**
- **Timecode Monitor**
- **Timecode Placement**

Input Format Cycle Gadget

Use the Input Format cycle gadget to choose the video standard you want to use for input. You can choose NTSC or PAL.

NTSC - 30 frames/second (60 fields/sec) frame size: 720 x 480 pixels

PAL - 25 frames/second (50 fields/sec) frame size: 720 x 576 pixels

Quality Level Cycle Gadget

Use the Quality Level cycle gadget to choose the level of compression for the video you're going to digitize.

Here are the approximate compression ratios, data rates, and storage capacities at the various quality settings available.

Video Quality, Compression, Storage and Speed:

Quality Level	Compression Ratio	Storage per Gigabyte	Data Transfer Rate
Rough 1	80:1	46:00.00	375 KB/sec
Rough 2	70:1	40:16.00	444 KB/sec
Draft 1	55:1	31:38.00	565 KB/sec
Draft 2	40:1	23:00.00	777 KB/sec
VHS 1	30:1	17:15.00	1.03 MB/sec
VHS 2	25:1	14:23.00	1.24 MB/sec
S-Video 1	20:1	11:30.00	1.55 MB/sec
S-Video 2	15:1	08:37.00	2.07 MB/sec
Broadcast 1	12:1	06:54.00	2.59 MB/sec
Broadcast 2	10:1	05:45.00	3.11 MB/sec
Master 1	8:1	04:36.00	3.88 MB/sec
Master 2	7:1	04:01.00	4.44 MB/sec
Master 3	6:1	03:27.00	5.18 MB/sec

Note: The numbers above are only rough approximations based on average video footage. The footage itself will be a major factor in determining the compression ratio and thus the data rate. This will in turn determine the highest quality a particular system can record.

Recording at a level higher than the setup supports will result in a message indicating fields/frames were lost during recording. Trying playback with data too abundant for the system will result in a looping effect in the video. Note that the highest quality level available on a particular system will depend on a number of things:

1) Sustained transfer rate of the hard drive

Video requires very high transfer rates and both the hard drive and the SCSI controller in use effect the sustainable transfer rate. See Section 3.2 for the recommended hard drives and controllers.

2) Disk fragmentation

After continued recording and deletion of video reels (JStreams) from a hard drive, fragmentation may occur. This can cause video files to be broken and scattered around a drive rather than being placed sequentially on the unit. This fragmentation can decrease hard drive efficiency and lower video quality levels. There are two ways to solve this problem. The first is by Quick Formatting. You should back up any video already on the drive, do a Quick Format on the video drive in question, and then restore the video. The second solution to do the EDLtoJStream operation.

Note: The EDLtoJStream operation requires that you have sufficient hard drive space available, the same amount as used by your current project. Ideally this should be done on a newly Quick Formatted partition or additional drive.

3) Video contents

The JPEG compression technique does not ensure a constant compression ratio across different video images. Instead, the quality of the images will be maintained while the

compression varies to compensate. For example, if the video is of blue skies and clouds, JPEG compression will be very efficient and compress the video more than the average listed in the above table. If the image is of a field of flowers, white noise, or if it is just simply a noisy signal, the compression will be less efficient to maintain the desired video quality. As a result, it is possible to have video footage that will not compress sufficiently to record at a particular quality given the data rate required. In Producer this is usually indicated by a requester reporting a loss of fields/frames after the recording is stopped. If this happens, you may need to record at a lower quality level.

Also note that the hardware of the Broadcaster Elite cannot correctly play two Shots with differing quality levels sequentially.

4) Drive storage remaining

Hard drives by their nature can transfer data faster on the outer tracks than on the inner tracks. Since most file systems (including our own) begin in the outer tracks, recording on an empty drive can often be accomplished at higher quality levels than when the drive is partially full.

5) The number of audio channels to be played

Due to the 16 bit bus architecture (Zorro II) of the audio card being used, playing audio uses more than its fair share of the bus bandwidth. As a result, playing a pair of audio tracks will usually lower the available video quality level by at least one level. Playing two pairs will reduce the maintainable video quality level by at least two levels. Keep this in mind since only two tracks are recorded when audio and video are recorded together. As such, it is often possible to record video and audio that cannot be successfully played back with another pair of audio tracks enabled.

We recommend using the LOWEST quality setting sufficient for your application. Begin with S-Video 1 and work your way up until the quality is sufficient for your needs.

Input Radio Buttons

The Input Radio Button determines which of the breakout box inputs are to be used as the video source for recording.

- **Composite**
- **S-Video**
- **Component**

Timecode Input

LTC Cycle Gadget

Clicking on this cycle gadget selects one of two options:

- **Stripe (Default)**
  Puts SMPTE timecode information into the JStream starting from a timecode of zero.

- **Read**
  Reads the incoming timecode off the LTC input. This information is stored in the video JStream on disk.

VITC Cycle Gadget

Clicking on this cycle gadget selects one of two options:

- **Stripe (Default)**
  Puts SMPTE timecode information into the JStream starting from a timecode of zero.

- **Read**
  Reads the incoming timecode off the selected video input. This information is stored in the JStream on disk.

VLine Field

Selects which scan line the VITC is read from. The default is 16.

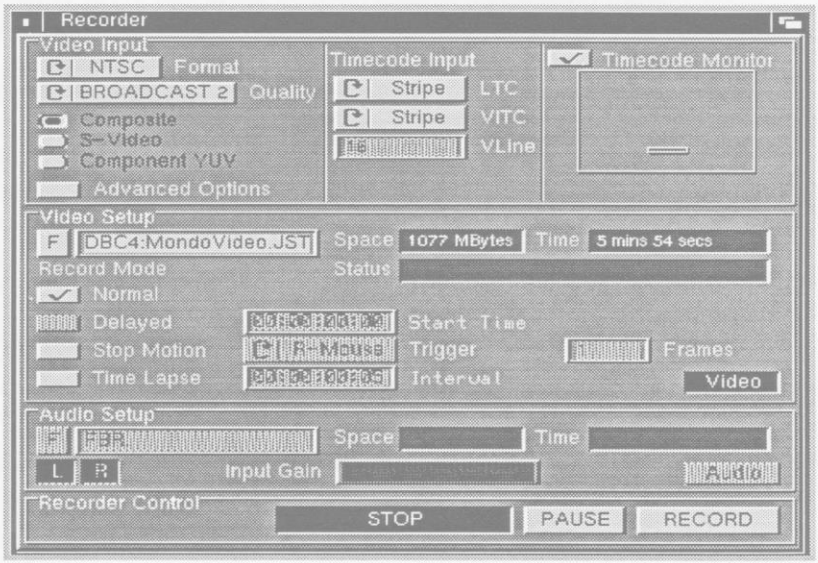
Timecode Monitor Button

These settings do not apply to the Elite because the Elite always provides timecode output.

This feature is included in the interface because it is relevant to older versions of Broadcaster hardware. The Timecode Monitor Enabled check mark allows the timecode burn-in window to be turned on and off. This window can only be present when the output is the same format (composite, Y/C, or component) as the chosen input (see Video Input at the beginning of this section).

Timecode Positioner (Placement)

The rectangular area below the Timecode Monitor Enabled check mark allows placement of the timecode burn-in window. Simply place the mouse pointer over the thin rectangle within the larger one, hold down the left mouse button, and move the window to the desired location. Release the mouse button to release the burn-in window.



Video Setup

The Video Setup section allows setup of the video recording mode and its accompanying options:

- **Filename**
- **Space & Time**
- **Record Mode**
- **Video Button**

Filename Button

The File button, denoted by "F", is used to open a file requestor to select the path and filename of the JStream you wish to record.

Filename Field

The Filename field allows specification of the name for a JStream. The "F" button may be used to specify a filename and path from a requester. Or a path and filename may be entered directly into the Filename field.

You can only record video onto a partition that has been formatted by the DBCFileSystem. All other partitions will be rejected and the Filename field will be left blank.

It is highly recommended that video be recorded to a high speed hard drive (preferably a Seagate Barracuda) attached to a Fastlane SCSI-II controller. Other hard drives may be used, but the level of video quality available may be substantially reduced. IDE drives connected to the internal controller of the Amiga 4000 CANNOT BE USED to record video with the Broadcaster Elite.

Space Display

Space Display indicates the approximate amount of space remaining on the drive during the record process.

Time Display

Time Display indicates the approximate time remaining during the record process. The time remaining may, at times, actually increase

during the recording process as the amount of compression of the video stream changes.

Record Mode Buttons

- **Normal**
  This is the default video capture mode. It captures video when you press the Record button.

- **Delayed (Start)**
  When this mode is active, recording of the input video will start at the timecode specified in the Start Time gadget. Enabling the Delayed Start recording mode activates the Start Time gadget. This feature is currently inactive and is planned for a later release.

  Start Time Field
  Enter in the start timecode for recording to begin.

- **Stop Motion**
  When this mode is active, the user can manually trigger the recording of a user selected number of frames. This technique is commonly used for stop-motion animation.

  Clicking the Stop Motion button enables the Trigger Cycle gadget and the Frames field.

  Trigger Cycle Gadget
  By clicking on the button, you can select from the keyboard, joystick or mouse button triggering of the capture process. The number of frames captured each time is set in the Frames number gadget.

  Frames Field
  Enter here the number of frames to capture with each trigger event during Stop Motion recording. Maximum number of frames per trigger event is 30 for NTSC and 25 for PAL.

  When recording multiple frames per trigger event, one frame

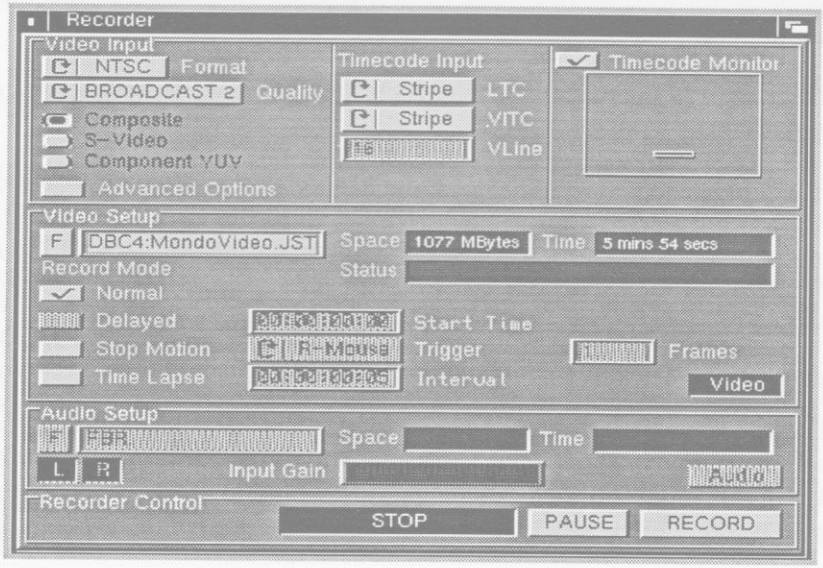
will be captured every five frames.

- **Time Lapse**
  Enabling the Time Lapse Recording mode activates the Interval input gadget. The time value entered into the Interval gadget controls how often a frame of video is captured.

  Interval Field
  The Interval field specifies the rate at which time lapse recording will capture frames. The minimum interval is 5 frames.

Video Button

Clicking on this button enables or disables video recording. With video disabled, you can record audio only.



Audio Setup

Allows customization of audio settings for the record process. Audio operations are only available when using the optional sound card.

At this time, the Producer software supports only the AD516 sound card from SunRize Industries. Version 2.08 of the SunRize software must be installed to work correctly with the Producer software.

Note: It is strongly recommended that partitions used to store audio Samples be formatted with the DBCFileSystem.

Filename Button

The File button, denoted by "F", is used to open a file requestor to select the path and filename of the audio Sample you wish to record.

Filename Field

The Filename field allows specification of the base name for an audio track. The "F" button may be used to specify a filename and path from a requester or a filename and path may be entered directly into the Filename field.

Producer will not allow you to enter a filename that already exists on the partition.

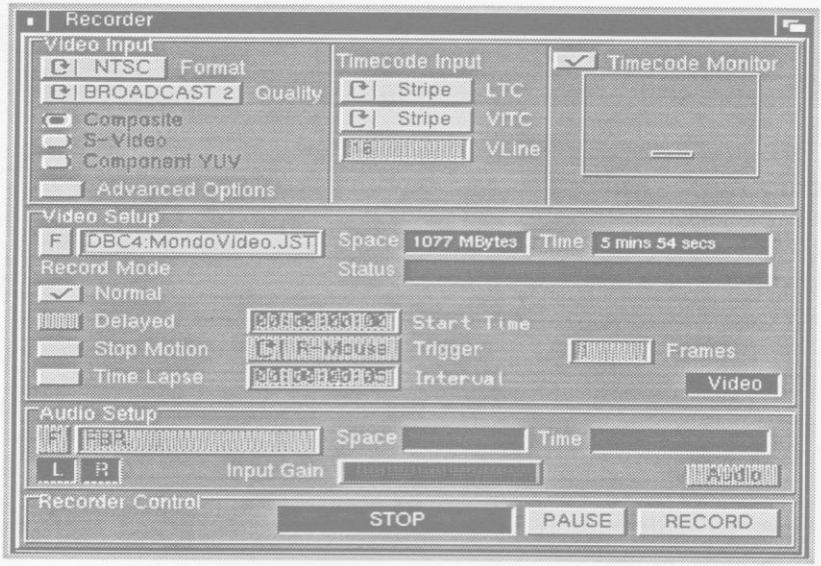
It is highly recommended that audio be recorded to a high speed, Fast SCSI-II hard drive attached to a SCSI-II controller. IDE drives connected to the internal controller of the Amiga 4000 CANNOT BE USED to record audio with the Broadcaster Elite. The audio should never be recorded to the same drive as the video.

L & R Buttons

The L & R buttons enable the recording of the left and right audio channels respectively. The Input Gain slider controls the level of the incoming audio. Adjust this slider to achieve the maximum volume on the input without clipping or distortion.

Audio Button

Clicking on the Audio Button enables or disables audio recording. If you have a supported audio card installed, audio recording is automatically enabled.



Recorder Control

Stop Button

Halts the record process.

Note: If audio was being recorded, the audio graphs for the audio clips will be created at this time. An information window will pop-up and indicate the approximate time it will take to create the audio graph. This is approximately 1/5 of the duration of the recorded material. (If the audio was not recorded to a DBCFileSystem, it will take a LOT longer.)

Pause Button

Allows you to temporarily halt the record process and then continue recording into the same JStream. This feature is for video only recording.

Record Button

Initiates the record process. There is a slight delay between when you actually press this button and when the first frame is captured.

In order to begin recording, one or both of the Video and Audio buttons in their respective setup areas must be selected. A valid volume and file-name must also be selected for each.

During the recording process, the Time Remaining and Space Remaining indicators are updated approximately once per second.

Advanced Options Button/Window

This window allows some control over the luminance processing functions of the video decoder.

Chroma Filter Button

Eliminates most of the color carrier signal from the Luminance. This should be enabled for composite inputs and disabled for S-Video and component inputs.

Pre-Emphasis Button

Emphasizes high frequency components to compensate for loss in the Chrominance Trap Filter.

Band Filter Button

The high frequency components of the luminance signal can be "peaked" by enabling two bandpass filters with selectable transfer characteristics.

Band Filter Frequency Cycle Gadget

This is the first cycle gadget below the Band Filter button. It selects from 4 different aperture center frequencies. The next cycle gadget selects the aperture factor.

Aperture Cycle Gadget

A cycle gadget to select the aperture factor.

Default Button

Restores the settings of all functions to their default for the selected video input.

Frame Size Display

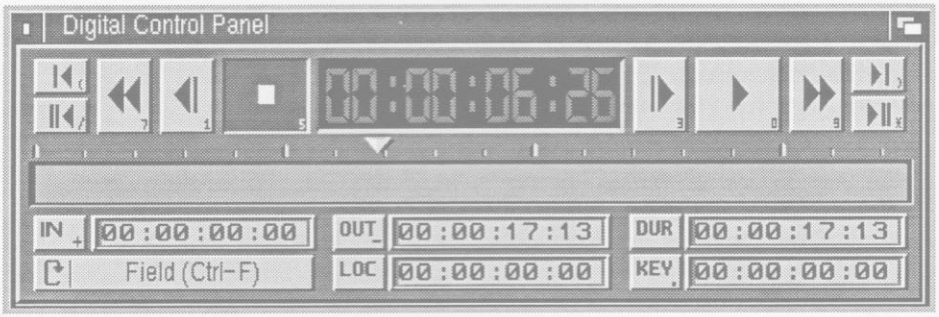
The Advanced Options window also displays important information about the video passing through the Elite while in record mode. The following information is presented and updated approximately once each second.

Mean Frame Size - The average frame size over the last 30 frames.

Peak Frame Size - The largest frame over the last 30 frames.

Compression Ratio - Average amount of compression achieved over the last 30 frames.

Digital Control Panel Window



Transport Buttons

|<

Keyboard shortcut: (

Move to the in time of a Shot.

Also, hitting 6 on the keyboard plays from the start of the Shot.

||<
Keyboard shortcut: /
Move to the earliest possible in time of a Shot. In a Source List, the earliest possible in time is the start of the JStream. In an EDL the earliest is the in time of the untrimmed Shot.

<<
Keyboard shortcut: 7
Skip Backwards (1 Second)

<|
Keyboard shortcut: 1
Step backwards one frame.

Stop
Keyboard shortcut: 5
Hitting this key stops playback. Hitting 2 or 8 on the numeric keypad will also stop the Elite from playing.

|>
Keyboard shortcut: 3
Step Forward 1 Frame

>
Keyboard shortcut: 0
Play From Current Position

>>
Keyboard shortcut: 9
Skip Forward (1 Second)

>|
Keyboard shortcut:)
Move to End of Shot

>||
*Keyboard shortcut: **
Move to the maximum out time for a Shot.

Time Code Display

Numerically shows the current timecode.

Position Bar

The horizontal bar in the center represents the active Shot. The light blue region within the dark blue region represents the Shot in relation to its maximum bounds.

Position Pointer

The yellow arrow pointer indicates the position of the currently displayed frame. In the case of audio, it represents the relative position within the audio sample, corresponding to the indicated timecode. Current timecode can be changed by using the mouse to position the pointer.

IN Button

The In button sets the in time for the selected Shot to the currently displayed frame. The keyboard equivalent is the "+" key on the numeric pad.

IN Field

A particular in time can be set with this field.

OUT Button

The Out button sets the out time for the selected Shot to the currently displayed frame. Keyboard equivalent is the "-" key on the numeric pad.

OUT Field

A particular out time can be set with this field.

DUR Button

The Dur button is non-functional. It only exists for symmetry. The timecode field beside this button shows the current setting.

DUR Field

A particular duration can be set with this field. Changing the duration will only effect the out time.

LOC Button (Locate)

The Loc button takes you to the frame indicated by the timecode in the Loc field.

LOC Field (Locate)

All of the timecode fields mentioned above can be edited directly by clicking inside of them and entering the numbers directly. The + and - keys of the numeric keypad allow you to increment and decrement the timecode by 1 frame with each keypress. You must hit enter to cause the edited timecode value to take effect.

KEY Button

The Key button sets the key frame of the active Shot to the currently displayed frame. The key frame is the frame shown when the Shot is selected. The keyboard equivalent is the "." on the numeric keypad. The timecode fields next to this button shows the current key frame timecode.

KEY Field

A particular key frame can be set using this field.

Frame/Field Cycle Gadget

Keyboard shortcut: Ctrl-F

When you are not playing video, the Broadcaster Elite displays a still image on your video monitor. The image comes from the currently selected Shot or JStream.

Use the Frame/Field cycle gadget to choose whether that still image consists of a complete frame (two fields interlaced together) or the first field of the frame shown twice.

Frame

If you choose Frame, you will see the two fields that make up a frame. Since each field is sampled 1/60th (or 1/50th for PAL) of a second apart in time, if anything moved between the two fields in the frame you'll see a flicker where the motion occurred. You don't see the flicker when the video is playing, but looking at a flickering still frame while editing can be very disconcerting to watch.

Field

If you choose Field, the Broadcaster Elite will show the first field of the frame twice. This gets rid of the flickering effect. Because you are only seeing one of the two fields that normally make up a frame, only half of the normal vertical resolution will be seen when you are not actually playing video. Usually this doesn't matter for editing purposes. Most video decks show only one field when parked.

Full Quality Playback

The Frame/Field setting is there for your convenience as you edit. It does not effect the video when you play it back. The Broadcaster Elite always plays back your video at full quality with all the fields shown.

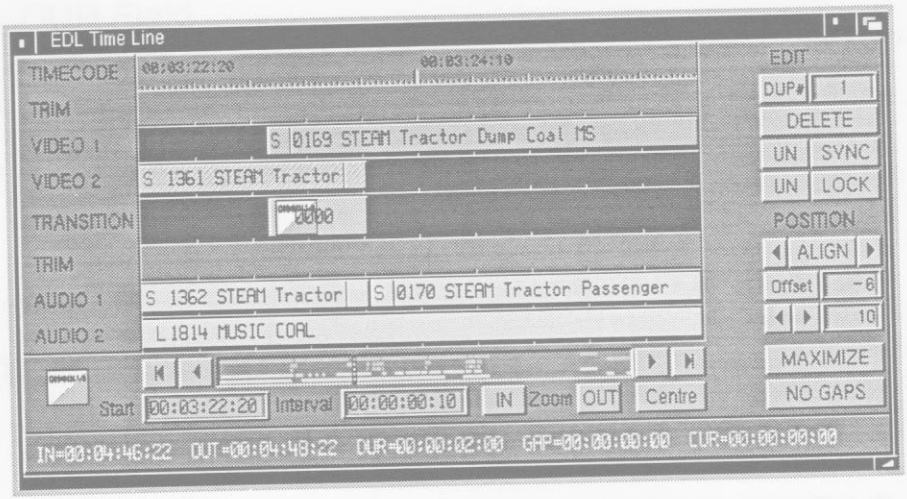
EDL Timeline Window

Keyboard shortcut: F8

The Timeline window gives you a graphic interface for editing EDLs. You can open it by selecting the Timeline command in the Tools menu, or by clicking the TIME button in the center column on the editing screen.

The Timeline gives you two video channels, a video trim channel, a video effects channel, two audio channels, and an audio trim channel. It provides a set of Edit buttons for Duplicating, Syncing, Locking, and Deleting Shots and Samples; a set of Position buttons for Aligning and Offset-

ting Shots and Samples; Start and Interval fields for changing the Timeline view; an EDL Scope for seeing the entire Timeline and graphically selecting an area to view; a timecode "ruler" at the top; and a series of useful timecode displays at the bottom:



The EDL Timeline window works with the currently open EDL on the Main Screen. If you do not have an EDL open in a Work Area, the EDL Timeline window will not show any Shots.

If you are looking at the Shots in an EDL in a Work Area, those Shots will show up on the EDL Timeline window when you open it. After changing EDLs in the Work Area, the EDL Timeline will update to show you the Shots in the new EDL.

You can move the Shots and Samples with the mouse. If a Shot or Sample is Synced (indicated by an "S" left of the Shot or Sample name in the EDL List in the Work Area), it will stay with its group. When moving a Shot or Sample, any other Shots or Samples synced to it will move along with it. This lets you keep video and audio together as you edit. It also allows you to keep completed sequences together.

To trim the in or out times for a Shot or Sample, drag the in or out handles. As you drag, you'll see the in or out frame on your video monitor while you change it.

If the in and out handles are not visible, use the zoom or center gadgets to expand the Shot or Sample. When you slide a Shot or Sample along the Timeline, you can push other Shots and Samples ahead of it by holding the Alt key.

To get information about an individual Shot or Sample on the Timeline, click it, and then open the information window with the Information command in the Edit Menu.

Timecode Ruler

This is where the small yellow pointer will appear to indicate current position on the Timeline. There are two timecodes displayed in the Timecode Ruler. The first represents the timecode at the left side of the Timeline display and the second is the timecode at the center of the Timeline display.

Trim Line (Video)

The Trim line shows a filmstrip that represents the length of the Shot as you logged it, which allows you to always see how much room you have to expand the Shot if you have first trimmed it with the trim handles on the EDL Timeline window.

You can also change the start and end time of the Shot without changing its duration or position on the Timeline. To do this, drag the filmstrip to the left or right in the Trim Line.

Video 1 Channel

The Video 1 Channel on the EDL Timeline window displays Shots as rectangles. They can be rearranged with the mouse.

Video 2 Channel

The Video 2 Channel also displays Shots as rectangles which can also be rearranged with the mouse. When you overlap two shots, one on the first

Video Channel and the other on the second Video Channel, Producer will automatically place a Transition Box in the Transition Channel. Until you render the desired transition, Producer will play it as a cut.

Transition Channel

When Shots on the two video channels overlap in time, Producer automatically creates a transition box on the EDL Timeline window. You'll see a small picture representing the type of transition displayed in the lower left corner of the Timeline window.

By default, the new Transition will be a Dissolve. You can select a different default transition type in the Transition Requester window. To change the transition type, highlight the clip by clicking on it once and then bring up the Transition window. See the Render Transition window section for information on processing transitions.

Until you render the transition, Producer will play the transition as a cut.

Depending on the length of the transition and the depth of zoom, you might see a small graphic image of the transition type on the Transition Box. Newly created transitions will always be of the active transition type. The active transition type is displayed in the lower left corner of the Timeline window. The active transition type is always that of the last selected transition clip. You can set the transition type for a particular Transition Box with the Transition Requester window.

Trim Line (Audio)

The Trim line shows a waveform graph that represents the length of the Sample as you logged it. The same as with video, you can always see how much room you have to expand the Sample if you've first trimmed it with the trim handles on the EDL Timeline window.

You can also change the start and end time of the Sample without changing its duration or position on the Timeline. To do this, drag the waveform graph left or right in the Trim Line.

Audio 1 Channel

The Audio 1 Channel shows Samples. Each sample can be a mono sample or a stereo pair. They can be rearranged with the mouse.

Note: You can change the levels and pans for the Active Sample by using the Information command to open the Information window. Controls for changing volume and pan are shown in the Information window.

Audio 2 Channel

The Audio 2 Channel also shows Samples. Each sample can be a mono sample or a stereo pair. They can be moved them with the mouse.

Note: You can change the levels and pans for the Active Sample by using the Information command to open the Information window. Controls for changing volume and pan are shown in the Information window.

Transition Icon

You can see the Transition Icon in any Transition Box if you're zoomed in close enough. Each kind of Transition has its own identifying icon. Internal Transition Icons are blue and white; External Transition Icons are blue and yellow.

If you select a Transition Box, you will see the Transition Icon for that Transition in the lower left corner of the EDL Timeline window. If no Transition Box is selected, you will see the Transition Icon for the default Transition. The Default Transition is the one that Producer will use when you overlap Shots in the two Video Channels. You can change the Transition in the Transition Requester window.

|< < > >|

The buttons below the Timeline allow moving to the beginning of the Timeline [|<], stepping back one displayed unit [<], stepping forward one displayed unit [>], and moving to the end of the Timeline [>|]. Also, the start time of the displayed area and its size can be adjusted with the Start and Interval fields respectively.

Note that the Interval represents the time between major graduations of the Timeline.

Zoom In/Out and Centre Buttons

The Zoom IN and OUT buttons allow showing less or more of the Timeline. The Centre button takes the currently selected Shot or Sample and moves it to the middle of the display at a zoom level which allows it to fill about 1/3 of the displayed region.

Start Field

The Start field shows the first frame number of the range of time you can see in the EDL Timeline window. You can type a new starting frame number directly into this field or you can change it by selecting a new range in the EDL Scope or by using the Zoom and Centre buttons.

Interval Field

The Interval field shows the amount of time between hash marks in the Timecode ruler. You can enter a new interval directly into this field, or you can change it with the Zoom and Centre buttons.

Edit Controls

The Edit buttons to the right of the Timeline display behave as their counterparts on the main screen.

DELETE Button

Deletes the highlighted Shot(s).

DUP# Button & DUP Field

Duplicates the highlighted Shot(s) the number of times indicated by the DUP Field.

UN & SYNC Buttons

Unsyncs and syncs, respectively, the highlighted Shot(s).

UN & LOCK Buttons

Unlocks and locks, respectively, the highlighted Shot(s).

Position Controls

The Position buttons allow precise movement of the Shots and Samples.

ALIGN Buttons

The Align button aligns the in time of two Shots or Samples. Select the first one and then hold the shift key to select the second one. The left align arrow aligns the lower Shot's out time to the in time of the upper Shot. The right align arrow aligns the lower Shot's in time to the out time of the upper Shot.

Offset Button & Offset Field

Use the Offset button and numeric field to align the beginning of one Source before or after the beginning of another by a specific number of frames. This works on any pair of selected Sources. Simply shift-click to select any combination of two Shots or Samples. If you want to do this with two Shots, make sure they are on two different channels. For example, you can use a positive offset number to specify exactly how long the shot in the first video channel will last before the transition to the second video channel begins. If you want the Shot in the second video channel to be before the Shot in the first video channel, use a negative Offset number.

Selecting different offsets can also be useful in fine tuning the synchronization of audio and video. This can be used, for example, in solving lip sync problems. Negative Offset numbers cause the audio to begin that number of frames before the video begins and positive numbers cause it to begin that number of frames after the video begins.

< > & Move Field

The left & right arrow keys below the Offset button allow the Shot to be moved by one frame. Holding down the shift while pressing the arrow keys, moves the Shot precisely the number of frames expressed in the numeric field. Holding down the alt key while pressing the arrow keys, moves the Shot 1 second. Holding down the shift and alt keys while

pressing down the arrow keys, moves the Shot precisely the number of seconds expressed in the numeric field.

MAXIMIZE Button

The Maximize button causes a Shot or Sample to be extended to the full size of its original logged length, or the maximum room it has between two other Shots or Samples.

NO GAPS Button

Click the No Gaps button to delete any empty spaces in the EDL Timeline. After you have moved or trimmed Shots there may be gaps left in the Timeline. By using the No Gaps button, no manual manipulation of shots is needed to eliminate these gaps.

Warning: The No Gaps operation also effects the Audio lines.

EDL Scope

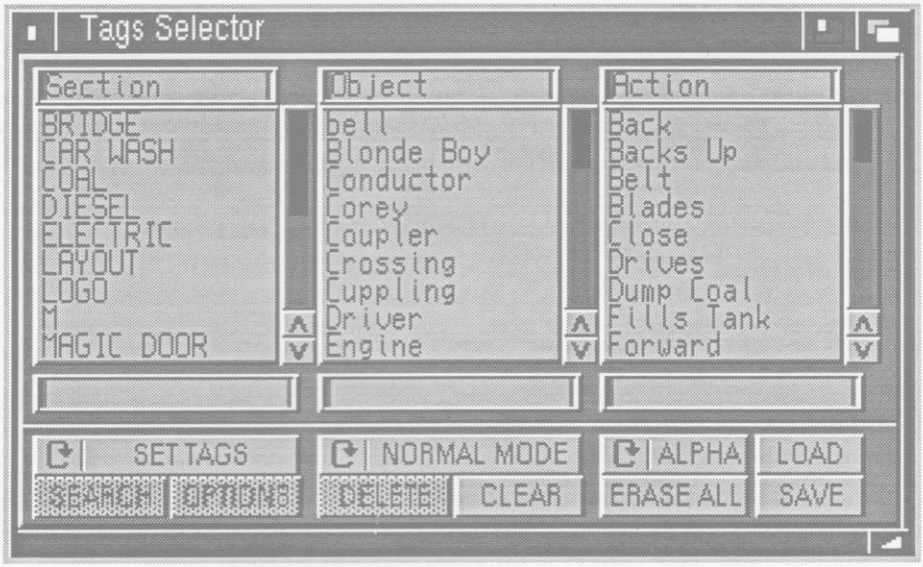
Directly below the Timelines is the EDL Scope window. The EDL Scope shows every Shot and Sample from timecode zero to the out frame of the EDL. You can use the EDL Scope to select the region the main EDL Timeline window represents. The area displayed on the Timeline is represented in the EDL Scope window by a black background color and is bounded by red braces.

To adjust the amount of the Timeline displayed, simply click in the Scope window at the in time and drag the mouse to the out time. When you let go of the left mouse button the Timeline will refresh. To pan to a new position on the Timeline without changing the zoom level, single-click the mouse at the new in-time you require on the EDL viewer.

Tags Selector Window

The Tags Selector window lets you assign descriptive words to your shots, and then find shots based on those words. It can even create new Shot Lists containing shots that match your search criteria.

There art three ways to access this window. Use the Tags Selector command in the Tools menu, the TAGS button in the center of the Main Screen, or type F9 to open the Tags Selector window:



You can have up to 8 categories of Tag words. To see more categories, simply resize the Tags Selector window to make it larger.

Each category has its own column where you can add up to 1000 Tag words. You can name each column to better organize your Tag words. For example you might want to have a column for all the actors in your video, another column describing types of camera angles, yet another column for locations, and more columns for whatever else you want to use to categorize your Shots. Then in the first column, enter names of all actors; enter the actual camera angles in column two, and all locations used for your footage in column three.

Tags allow you to label Shots quickly without having to type descriptions for each one. Once you have done that, you can use the Tags Selector window to find specific types of Shots, like all of those done at a specific location, with certain characters, from certain camera angles, etc.

Using the Search button at the Project level, Producer can create a Source List of all the Shots that match any combination of Tags. If you are already at the Source level, it will highlight the matching tagged Shots in the currently active list.

When you're slaving away at 2am trying to find that perfect shot that you know you have somewhere, or you want to quickly review all the takes for a particular Shot, the Tags Selector window is your powerful ally. Never again will you forget to use that perfect Shot. The Tags Selector window lets you keep a handle on even the largest editing projects.

The Tags Selector window has three modes of operation:

- **Normal**
- **Edit**
- **Delete**

You can select the mode using the Mode cycle gadget.

Normal Mode

Normal mode has two submodes of its own: Set Tags and Search Tags. Use the Set Tags/Search Tags cycle gadget to switch between the submodes. This cycle gadget is only available in Normal mode.

Set Tags Submode

Allows you to assign Tags to a selected Shot or enter new tags into any of the eight columns.

Search Tags Submode

At the Project level, this mode allows you to generate Source Lists made up of Shots that match the Tags that are selected.

At the Sources level, you can select all of the Shots in the current Source List that match the Tags you select in the columns.

Edit Mode

Allows you to change the Tags in the columns. You can also change the category names as in Normal mode.

Delete Mode

Allows you to eliminate Tags from the columns. Select the Tags you want to delete, and then click the Delete button.

Load and Save Buttons

Use the Save button to save all of the Tags from the current project. You can then use the Load button to bring a group of saved Tags into the current project. This can be useful, for instance, to Load in commonly used sets of Tags for use in multiple projects.

Clear Button

Use the Clear button to deselect the currently highlighted Tags. This works while in Normal and Delete modes.

Erase All Button

Click the Erase All button to eliminate all Tags from the columns. It will also remove all Tags from all your Shots in the current Project.

Warning: This will REALLY erase all your Tags. Since it takes time to set up the Tags, do not do this unless you really want to get rid of your Tags forever.

Order Cycle Gadget

Use the order cycle gadget to display the Tags in alphabetical order or the order in which they were entered.

Tag Columns

There are eight sets of Tags available for categories of keywords to associate with Shots.

In Normal or Edit mode, type a label in the field above each column to describe that column or category. Normal mode allows you to add new

words to a column by typing them individually into the field below the column. In Edit mode, select any word to change it. You can change any word by selecting it while in Edit mode. It will appear in the field below the column and you can edit it there.

From the Work Area of the Main Screen, you can assign your Tags to individual Shots by choosing the Tag that you want to associate with the Shot and clicking on it. You have the flexibility of choosing multiple Tags from the same list.

Search Button

In the Work Area at the Project level, the Search button lets you create new Source Lists of Shots that match the Tag words that you select. For example, you can select the name of a character in one column of the Tags Selector window and a camera angle in another column. Click the Search button, and Producer will find all the Shots that have that character shot with that camera angle and put them into a new Source List for you. Then you can choose the best shot and drag it into an EDL.

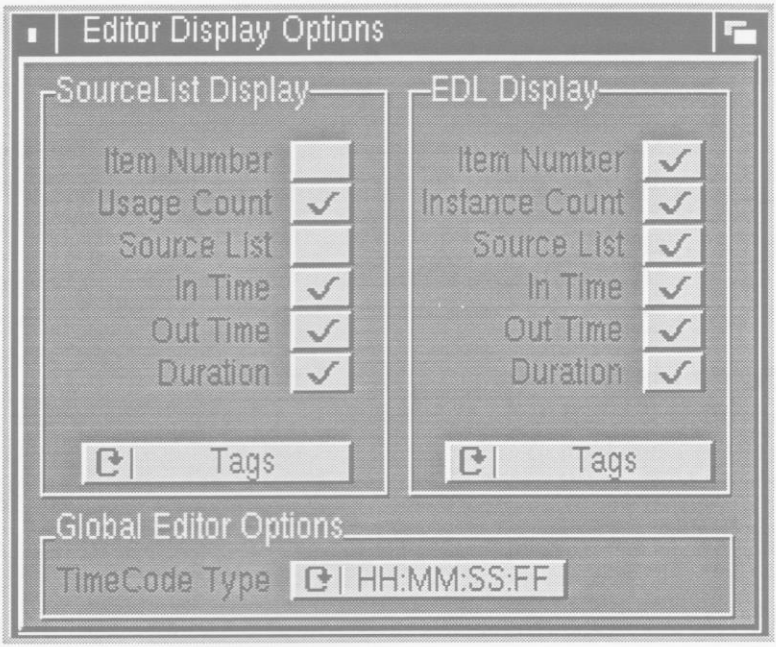
When the current Work Area is at the Sources level, the Search button lets you select all shots within a Source List that match the Tag words you select.

Options Button

Use the Options button to open the Search Options window (see the Search Options Window section later in this chapter).

Editor Display Options Window

Click the OPTS button to open the Editor Display Options window. The gadgets in this window let you choose how you want Shots and Samples to be labelled in the Work Area and in the EDL Timeline window.



The Editor Display Options window is split ito three parts:

- **Source List Display**
  Use these buttons to choose how to display the Shots in a Source List in the Work Area.

  The Display cycle gadget lets you choose to display Tags, Notes or Nothing for the Shots and Samples that are shown within a Source List.

  Note: You can see the Shots in a Source List by double clicking the name of a Source List in one of the Work Areas on the Main Screen.

- **EDL Display**
  Use these buttons to choose how to label the Shots in EDLs in the Work Area.

The Display cycle gadget also lets you choose to display Tags, Notes or Nothing for the Shots and Samples that are graphically displayed in the EDL Timeline window.

Note: You can see the Shots in EDL lists by double clicking the name of an EDL in one of the Work Areas on the Main Screen.

- **Global Editor Options**
  Use the Global Editor Options to choose how to display time code throughout the program.

Source List Display and EDL Display

The choices for the Source List Display and the EDL Display are almost the same. They both offer a cycle gadget and six checkbox buttons you can click to choose the information you want to see with your Shots.

Click once to see a check mark in the button, and again to remove the check mark. To select one of the options, click it so that the check mark appears.

You can choose to view any combination of the following display options with your Source Shots and your EDL Shots.

Item Number Button

With this button selected, the Shot number is displayed with each shot. The Shot number shows the order in which the Shot was created or added to the Source List when you logged its original JStream.

Usage Count Button

When selected, the number of times that a shot has been used in an EDL is displayed.

Instance Count Button

If the Shot has been used more than once, each time that Shot appears in the EDL, it will be numbered.

Source List Button

When you check this button, you will see a number identifying the Shot's parent Source List.

In Time Button

When you check this button you will see the Shot's In Time in its parent JStream.

Out Time Button

When you check this button you will see the Shot's Out Time in its parent JStream.

Duration Button

When you check this button, the length of the Shot will be displayed.

Tags/Notes/Nothing Cycle Gadget

Use the cycle gadgets at the bottom to choose between displaying the Tags, Notes or Nothing for each Shot.

The Tags for a particular shot are chosen from the Tags Selector window.

The Notes are created in the Notes text field at the bottom of the display.

Nothing means just that. Neither Tags Nor Notes will be displayed.

Global Editor Options

In the Global Editor Options area of the Editor Display Options window, there is a cycle gadget. Use it to choose how you want to see time code throughout the program.

Timecode Type Cycle Gadget

There are two options for timecode type:

- **Frame #**
  Use this setting to see all time code numbers as absolute frame numbers. For example, a time of 00:00:1:20 in NTSC time code would be shown as 50 frames.

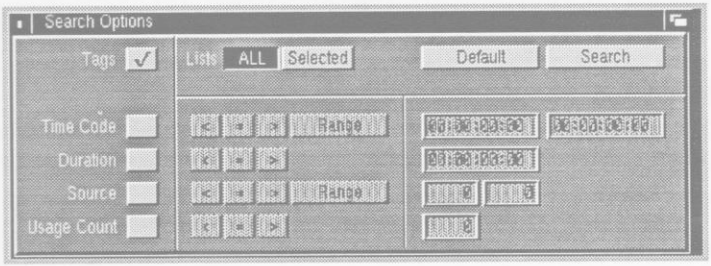
  This method of displaying time code can be useful when you are working on short videos like commercials or animations.

  Note: This setting does not effect the timecode burn-in window on the output, which is always shown in HH:MM:SS:FF format.

  If you choose to display time code as frame numbers, you will not be able to enter or edit time code numbers directly into any of Producer's time code fields.

- **HH:MM:SS:FF**
  Use this setting to view all time code numbers in the hours:minutes:seconds:frames format. This format can be useful when you are working on longer videos.

Search Options Window



Click the SRCH button to open the Search Options window.

This window, along with the extensive tagging options of the Tags Selector window, allow you to automatically create Source Lists full of Shots that fit the search parameters you define.

The Search Options window is divided into four sections.

The top portion has two buttons, ALL & Selected. Click All to search all Source Lists. Click Selected when you want to restrict the search to only those Source Lists that you have already selected.

Click the Search button on the right to automatically create a new Source List based on your search criteria. A new Source List will only be created when the selected Work Area (the one with the green bar at the top) is at the Project level. At the Project level you can see all the JStreams and Source Lists if the Work Area is showing Sources, or all the Edit Decision Lists if the Work Area is showing EDLs.

Click the Default button when you want to reset all the parameters to their defaults. Once you have done this, only Tags will be selected.

The left section has buttons that let you choose your search criteria. You can select any number of the buttons to narrow the search. To choose a search criteria, click its button so you see a check mark. To remove a criteria from the search, click its button again so the check mark disappears.

The middle section has buttons to set the parameters of the corresponding search criteria. Some of these buttons activate fields in the rightmost section where you can enter parameter values.

The search criteria buttons on the left all correspond to the different attributes of the scenes to be searched. These attributes are listed below:

- **Tags**
- **Timecode**
- **Duration**
- **Source**
- **Usage Count**

Lists: All & Selected Buttons

Selecting one of these buttons will enable searching on either all Source Lists or only selected Source Lists

Default Button

Click the Default button when you want to reset all the parameters to their defaults. The default setting is to have only Tags selected.

Search Button

Click the Search button and Producer will search the indicated Source Lists for Shots matching the search criteria. All Shots matching the criteria will be copied into a new Source List

Tags Button

Activating this button will select only those scenes which are tagged with the selected tags in the Tags Selector window.

Time Code Button

Checking this button activates the four sort operation buttons in the center section. This sort criterion operates on the In Time of the scene in its parent JStream.

In order, they are:

- <
  Less than - Activates the first timecode entry gadget for entry of the top limit for the In Time.

- =
  Equal to - Activates the first timecode entry gadget for entry of the In Time to match.

- >
  Greater than - Activates the first timecode entry gadget for entry of the bottom limit for the In Time.

- **Range**
  Range of In Times - Activates both timecode entry gadgets. Enter a beginning and ending timecode and all scenes with an In Time within that range will be included.

The "equal to" button may be combined with either the "less than" or "greater than" buttons.

Duration Button

Checking this button activates the three sort operation buttons in the center section. This sort criterion operates on the duration of the Shot.

In order, they are:

- <
  Less than - Activates the timecode entry gadget for entry of the top limit for the duration.

- =
  Equal to - Activates the timecode entry gadget for entry of the duration to match.

- >
  Greater than - Activates the timecode entry gadget for entry of the bottom limit for the duration.

The "equal to" button may be combined with either the "less than" or greater than" buttons.

Source Button

Checking this button activates the four sort operation buttons in the center section. This sort criterion operates on the Source List number of the shots parent Source List.

In order, they are:

- <
  Less than - Activates the first numeric entry gadget for entry of the top limit for the Source List number.

- =
  Equal to - Activates the first numeric entry gadget for entry of the Source List number to match.

- >
  Greater than - Activates the first numeric entry gadget for entry of the bottom limit for the Source number.

- **Range**
  Range of Source numbers - Activates both numeric entry gadgets. Enter a beginning and ending Source List number and all Shots belonging to a Source List within that range will be included.

The "equal to" button may be combined with either the "less than" or "greater than" buttons.

Usage Count Button

Checking this button activates the three sort operation buttons in the center section. This sort criterion operates on the usage count of each Shot.

In order, they are:

- <
  Less than - Activates the numeric entry gadget for entry of the top limit for the usage count.

- =
  Equal to - Activates the numeric entry gadget for entry of the usage count to match.

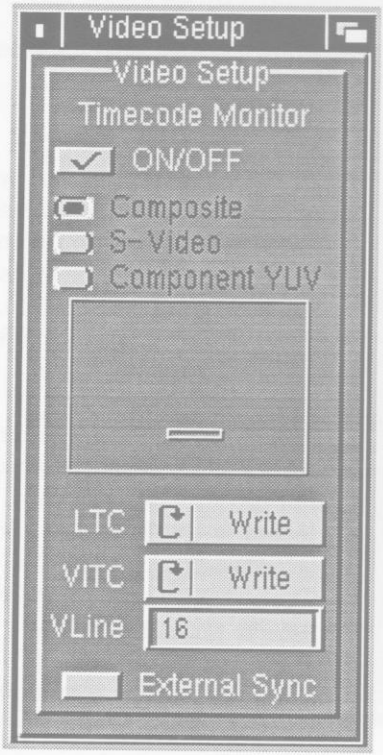
- **>**
  Greater than - Activates the numeric entry gadget for entry of the bottom limit for the usage count.

The "equal to" button may be combined with either the "less than" or "greater than" buttons.

Video Setup Window

Keyboard shortcut: F7 or R-Amiga-V

Allows you to set the parameters of the timecode burn-in window and to enable or disable external sync.



This window controls the timecode burn-in window, timecode output and external sync.

Timecode Monitor

ON/OFF - Turns the timecode burn-in window on or off.

The Broadcaster Elite does not require an output type selected. However, in early revisions of the Broadcaster hardware the burn-in window could only appear on one of the following three outputs:

- **Composite Video**
- **S-Video**
- **Component Video**

Timecode Positioner

A square box fills the center section of the window and contains a smaller rectangle that can be dragged around the larger box to place the burn-in window in your output.

LTC

Select either to Write LTC to the LTC out jack, or select None.

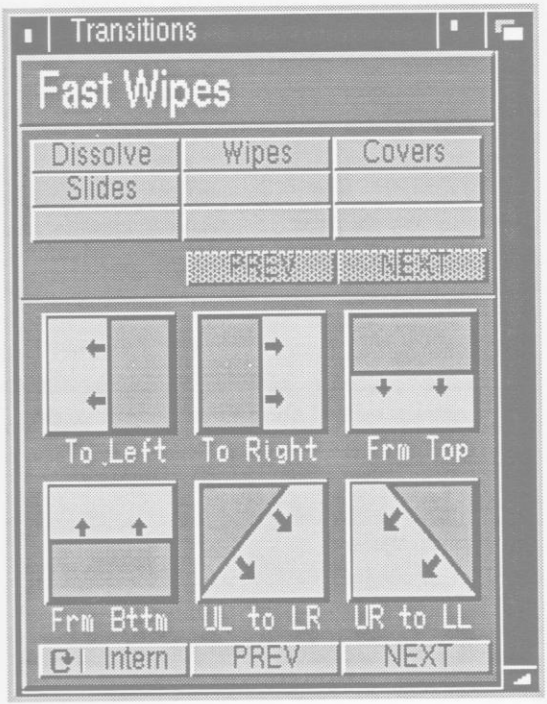
VITC

Select either to Write VITC onto the outgoing video, or select None.

External Sync

Enable or disable syncing to incoming video.

Transitions Requester



Allows you to select a video transition.

First choose whether you want to use an internal or external effect. Then choose the class of effect you want to use, whether it be a dissolve, wipe, cover or slide. Then choose the exact effect you want.

The Transition Requester works in two ways. If you do not have a transition selected in the EDL Timeline window, you can use the Transition Requester window to set the default transition. The default transition is the transition

that Producer puts into the Timeline whenever you overlap two Shots. When you first start Producer, the default transition is a dissolve. The second way to use this requester is to change a specific transition. To do so, in the Timeline, click the transition that you want to change. Then click a new transition in the Transition Requester. The transition in the Timeline will change to the new transition type.

Note: If you zoom in on the EDL Timeline, you can see an icon for each transition in the transition channel. This icon gives you a visual indication of the type of transition that Producer will use.

Internal/External Cycle Gadget

In the lower left corner of the window is a cycle gadget for choosing between internal and external effects. Internal effects are those that Producer can do by itself. External effects are those that other programs, like Art Department Professional from Elastic Reality, Inc.; or ImageFX from Nova Design, Inc. can produce.

Internal Transitions

Internal transitions render faster, and use special techniques to reduce or eliminate generation loss.

External Transitions

External transitions take longer to render because each field involved in the effect must be decompressed and then compressed again. Some of them also have fixed lengths. But by using external transitions, you have more to choose from and also the ability to create your own transitions.

Classes Buttons

At the top of the window are a group of buttons for choosing the effect class of transitions. There are currently four classes of effects:

- **Dissolve**
  A dissolve is where the end of one shot fades out as the beginning of the next shot fades in.

- **Wipes**
  A wipe is where the screen changes from one shot to the next using a pattern.

- **Covers**
  A cover is where the next shot slides onto the screen, covering the previous shot.

- **Slides**
  A slide is where one shot slides off of the screen as the next Shot slides onto the screen.

Transition Buttons

There are a variety of transitions available in the Transitions Requester window. To choose one, click one of the Transition buttons. Each button has a picture and a brief description indicating the type of transition.

Some of the external transitions have fixed lengths which are written directly on the button for that transition.

You can re-size the Transitions Requester window to see more available transitions, or you can use the Previous and Next buttons to show different pages of transitions.

To see your transitions, you first have to render them from the Render Transitions Requester

Render Transitions Window

Keyboard shortcut: Right-Amiga R

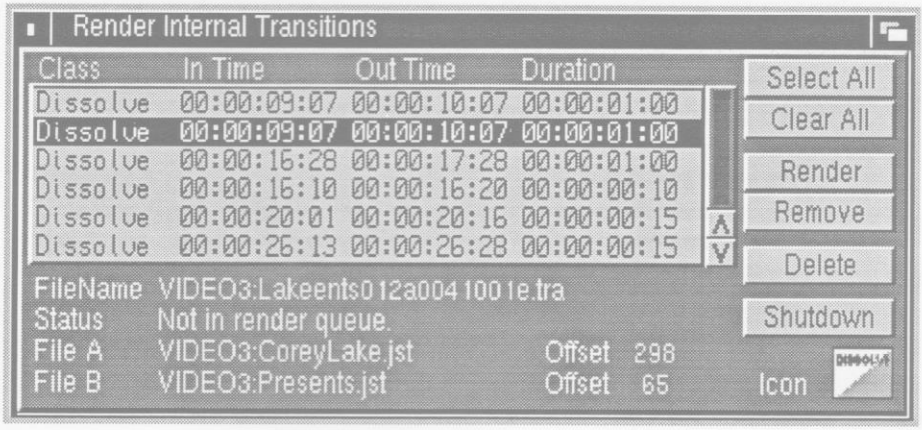
Producer lets you easily create transitions between Shots in the EDL Timeline window (see above). These transitions are rendered in the background, rather than in real time.

Note: There are two kinds of transitions: internal and external. You can render the internal transitions using the Render Transitions window. You can render the external transitions by using the ARexx script Generate.

To open the Render Transitions window, use the Render Transitions command in the Tools menu. The Render Transitions window lets you choose any number of pending internal transitions to render. It renders them in the background so you can continue to edit while they render.

Before you can render transitions you have to create them. You create them in the EDL Timeline window by overlapping Shots on the two video lines. Producer then automatically creates a transition on the transition line. You can change the transition type with the Transitions Requester.

Once you have one or more internal transitions setup, use the Render Transitions window to render them:



This window lets you choose which transitions to render. If you change your mind, you can cancel the rendering process at any time. You can also delete any finished transitions.

In the upper left corner of the window is a list showing the Class, In Time, Out Time, and Duration for each transition.

When you click the name of a transition in the list you will see further information about it below the list. You'll see the transition icon, the file-name and path, and the current status. The status will indicate one of the following:

- **The transition has been rendered.**
- **The transition is currently being rendered.**
- **The transition is in the queue to be rendered.**
- **The transition is not in the queue.**
- **The transition is to be rendered externally.**

Note: Rendering the internal transitions requires an extra two megabytes of fast ram. Producer will try to allocate the RAM from the system the first time the Render Internal Transitions requester is opened. If the Producer is unable to access enough memory, you'll see an error message. If that happens, make sure there's enough RAM installed in your system. Then try closing other programs to free up 2 megs of memory.

Buttons

On the right side of the window is a row of buttons:

- **Select All**
- **Clear All**
- **Render**
- **Remove**
- **Delete**
- **Shut Down**

Select All Button

Clicking this button allows you to select all the transitions in the EDL Timeline window. If the EDL Work Area is at the Project level, it will select all the transitions in all the EDLs. If the Work Area is at the EDL level it will select the transitions in the current EDL. You can then render all the selected transitions at once with the Render button (see the following page).

You can also use this along with the transition requestor to change all transitions to a particular type.

Clear All Button

Click the Clear All button to unselect all selected transitions.

Note: you can also do selecting, multi-selecting, or unselecting by holding down the shift key and clicking the mouse on the list of transitions.

Render Button

Click the Render Button to add all the selected transitions to the render queue, and begin rendering the first transition in the que in the background.

Note: Although the Amiga multitasks, background rendering is only performed when the video is not playing. When the play is stopped, the rendering will start again automatically.

Remove Button

Click the Remove button to Remove a transition from the render queue.

You can also use it to cancel a transition that is currently being rendered.

Delete Button

Click the Delete button to delete the selected transition file. Do this when you change your mind about the type or length of a transition and want to get rid of the old one to render a new one.

Shut Down Button

Click this button to terminate any rendering in process; close down the window to free up the memory being used by the rendering process.

Automatic Shot Syncing

When you render a transition or place one in the queue to be rendered, the software will now automatically 'Sync' the two Shots on either side of the transition. An "S" will appear on the left of each of these Shots in the Edit Decision List. When you move one of these Shots, the other will move with it.

This protects you from accidently separating or changing the timing between the two Shots, which would make the rendered transition invalid.

The in and out trim bars that would effect a rendered transition are also locked for the same reason.

To change some factor of a transition such as duration, use delete in the Render Transition window (or Remove if in the render queue). Once the transition is deleted (or removed) the trim bars are free again. The Shots will still be synced, but you can unsync them by selecting either Shot and clicking the Unsync button on the Main Screen or on the EDL Timeline window.

Rendering External Transitions

Included in the Scripts drawer of your Producer installation is an ARexx script called "Generate," which takes a transition list (TList) for a project and creates all of the external transitions required by the project. Generate will only create new transitions. This includes brand new transitions or ones that have been changed in some way since they were originally rendered.

Generate

Since Generate is an ARexx script, the ARexx command interpreter must be running before you can execute Generate. The RexxMast program should be in your Workbench WBStartup drawer so that it runs

automatically when you boot your computer. Consult your AmigaOS manuals if you need more information about ARexx and RexxMast.

Generate uses Art Department Pro V2.5 from Elastic Reality to render transitions. ADPro must already be running when you run Generate.

To use Generate, double click the Generate icon. It will ask you which transition list you want to process. Each Project has its own transition list. Select the transition list you want to process and click the OK button. ADPro will then process your external transitions.

Transition List File

Producer will save the Transition List (TList) file when you save a project. The Generate script uses this file to render external transitions.

The TList file is a plain ASCII text file with an entry for each transition in the project. Each transition entry includes details about the source files and transition type.

Here's an example entry. Notice that it contains eight pieces of information:

DIS 00:00:13.00 734 Source1.jst 230 Source2.jst 30 Trans.jst

1. **Transition Type**
   In our example you will see "DIS" for dissolve.

2. **EDL In Time**
   In our example you will see "00:00:13:00".

3. **First frame of Source A**
   In our example you will see "734".

4. **Name w/path of Source A**
   In our example you will see "Source1.jst".

5. **First frame of Source B**
   In our example you will see "230".

6. **Name w/path of Source B**
   In our example you will see "Source2.jst".

7. **Duration of transition in frames**
   In our example you will see "30".

8. **Transition filename w/path**
   In our example you will see "Trans.jst".

Some transitions use an additional ninth parameter that is specific to the transition type.

External Transition Classes

There are seven classes of external transitions:

- **DIS**
  Dissolve
- **WIP**
  Wipe
- **SLD**
  Slide
- **COV**
  Cover
- **TNM**
  Tranim (Transition Animation)
- **FAD**
  Fade
- **Custom Wipes**

Dissolve

The A and B sources are mixed, beginning with 100% A and 0% B and ending with 0% A and 100% B.

Example:
DIS 00:00:13.00 734 DBC:A.jst 230 DBC:B.jst 30 DBC:0000.jst

Wipes

A Wipe transition "wipes" away the A source to reveal the B source underneath.

The internal transition module supports orthogonal and diagonal wipes as well as Big Blocks and Small Blocks wipes.

The Wipe transition adds a ninth parameter to indicate one of four directions : UP, DOWN, LEFT, or RIGHT. These are the horizontal and vertical wipes. The other wipes are actually created through the Tranim routine.

Example:

WIP 00:00:13.00 734 V:A.jst 230 V:B.jst 30 V:0000.jst LEFT

Slides

A Slide transition "slides" in the B source, pushing the A source off the screen.

The Slide transition adds a ninth parameter to indicate one of four directions: UP, DOWN, LEFT, or RIGHT.

Example:

SLD 00:00:13.00 734 V:A.jst 230 V:B.jst 30 V:0000.jst DOWN

Covers

A Cover transition brings in the B source from one of the four cardinal directions, "covering" the A source.

The Cover transition adds a ninth parameter to indicate one of four direc-

tions: UP, DOWN, LEFT, or RIGHT.

Example:

COV 00:00:13.00 734 V:A.jst 230 V:B.jst 30 V:cover.jst DOWN

Transition Anims

Part of the power and flexibility of doing transitions off-line begins to be apparent in the use of animations as wipe templates. The diagonal wipes, circle wipe and paintbrush wipe, which are included in Producer software, are accomplished by using animations to control the position of different video sources and where they appear on the screen.

The Tranim script uses the ninth parameter to indicate the full path and filename of the animation to be used in rendering the transition.

Example:

TNM 00:00:13.00 734 V:A.jst 230 V:B.jst 30 Anims:DiagUL2LR.anim

Note: The Tranim routine assumes the animations have 2 loop frames at the end.

Tranims do not show up in the Transition Requester window.

Fade In/Out

This transition type cannot be selected from the Transition Requester because it is currently setup for transitions between two sources and the Fade uses just one source. If you wish to render a transition along with others, you can add an entry for it to your projects TList.

Fades use the ninth parameter to select either a Fade IN or a Fade OUT. Parameters five and six for the B source are not used but must be present in order for the entry to be used by the Generate script.

Example:

FAD 00:00:13.00 734 V:A.jst 0 foo..jst 30 V:FadeOut.jst OUT

Fades don't show up in the Transition Requester window.

Custom Wipes

The creation of custom wipes is as easy as creating an animation or anim. Several third party software packages are available for creating animations suitable for use as wipes. Deluxe Paint IV and Brilliance are two examples of painting/animation programs which are best suited for the creation of these animations.

The anims should be at least the resolution of the video stream. For NTSC this is 720 x 480, and 720 x 576 for PAL. If the program of choice uses larger resolutions than these, use the upper left corner of the appropriate size (i.e. the upper left 720 x 576 of a 736 x 582 screen).

The anims may be any number of colors from 2 to the number supported by the animation program.

The convention is that each pixel of an anim which is true black (0,0,0) is replaced with a pixel from the A video reel. True white pixels (255,255,255) are replaced with a pixel from the B video reel, and all other pixels are left as the color of the anim. Therefore, it is easy to begin with a black frame and end with a white frame to create a wipe.

There are several examples included in the Anims directory.

Smoother transitions can be created by field rendering the animations. To ease the creation of this type of animation, we have included an AREXX script for ADPro V2.5 to convert a frame rendered animation into a field-rendered animation. Begin by creating a full size frame animation which is double the number of frames desired in the completed animation (i.e. a 720 x 480, 60 frame anim for an NTSC 30 frame wipe). When finished, run the LaceANIM AREXX script located in the Scripts drawer of your Producer installation to convert it to an interlaced anim (in this

example a 720 x 480, 30 frame anim). The resulting animation can be used with the Tranim script to generate transitions.

Custom wipes do not show up in the Transition Requester.

Custom Transitions

With a working knowledge of AREXX, it is possible to use external image processing programs such as ADPro 2.5 or ImageFX 2.0 to create even more spectacular transitional effects including layering and picture-in-picture. You can also use 3-D animation programs to create video transitions or texture map image sequences from JStreams onto 3-D objects. You can then put the resulting rendered images back into a JStream for playback.

Keyboard Shortcuts

Menus
=====

Project Menu	Keyboard Shortcut	Button
New	RA-N	
Open	RA-O	
Save	RA-S	
Save As...	RA-A	
Select Screen Mode	RA-M	
Export		
Change Project Title	RA-C	
About	RA-A	
Workbench		
Quit	RA-Q	

Edit Menu		
New		
Add Comment		
Information	RA-I	
Log Mode	RA-L	LOG
Split	RA-/	SPLIT
Delete	RA-D	DEL
Duplicate	RA-Z	DUP#
XFER to EDL	TAB	--->
Mark All	a	ALL
UnMark All	n	NONE
Invert All	v	INV
Lock Item		LOCK
Unlock Item		UNLOC
Sync Item		SYNC
UnSync Item		UNSYN

Tools Menu

Digital Video Recorder	r	Record
Digital Control Panel	F6	DCP
EDL Timeline	F8	TIME
Tags Selector	F9	TAGS
Editor Display Options	F10	OPT
Search Options		SRCH
Video Setup	F7	
EDL to Reel		
Transition Requestor	RA-T	
Render Transitions	RA-R	

Imports Options Menu

- Import All Video Reels
- Import One Video Reel
- Import All Audio Reels
- Import One Audio Reel
- Import All Synced VA
- Import One Synced VA
- Import Frame From Reel

Transport Control

Function	Keypad	Button
Beginning of clip	(	|<
Beginning of reel	/	||<
Jump Backward 1 Second	7	<<
Back One Frame	1	<|
Stop	8/5/2	[]
Step Forward One Frame	3	|>
Play From Beginning	6	
Play From Current Position	0	>
Jump Forward 1 Second	9	>>
End of Clip	/	>|
End of Reel	*	>>|

```
Clip/Logging Control
====================
Function                    Keypad          Button
  Set In Time                 +               IN
  Set Out Time                -               OUT
  Set Keyframe                .               KEY

Index Movement
==============
  Out to Index Level          F1
  Enter First List            F2
  Enter Last List             F3
  Back One List               F4
  Forward One List            F5
  Enter Current List          RETURN
  Move down one entry         Crsr-Down
  Move up one entry           Crsr-Up
  Make Right Index active     Crsr-Right
  Make Left Index Active      Crsr-Left

Other Functions
===============
  Field/Frame Display         Ctrl-f          Field/Frame
  Edit Notes Title Field      T
```

Appendix A: Common Questions & Answers

This chapter attempts to save you a phone call to Applied Magic, Inc. by answering what we have found to be the most common questions about this product.

- Timecode on outputs
- Timecode Burn-In/Striping
- Titling or Text Overlay
- Toaster Compatibility
- Other Amigas - A3000/A3000T
- Can I Adjust Resolution?
- Slow Speedtest results
- Looping Video
- Video keeps playing...
- Audio stopped working...

Timecode on outputs

Q. How many outputs are receiving timecode at any one time?

A. All output receives timecode.

Timecode Burn-In/Striping

Q. Can the timecode burn-in window be placed on one output, but the actual striping of the timecode done on another output?

A. No. As stated above, if active, the burn-in window will be present on all outputs.

Titling or Text Overlay

Q. Can Titling/Text Overlay be done on the Broadcaster Elite?

A. Yes. You have two options to do Titling/Text Overlay:

1. Separate computer with Genlock - A separate machine could genlock to the video output of the Broadcaster Elite and do the character generation as needed, using an external genlock.

2. Software - Many software packages may be used to rotoscope the individual JPEG frames of a recording/animation with text.

Toaster Compatibility

Q. Can I use my Toaster with the Broadcaster Elite?

A. Certainly. However, there are a number of limitations which may encourage you to put it into a separate machine.

First, the Toaster takes the space of two slots and thus there is not room for the Broadcaster Elite, SCSI-II Controller, and the sound card while using the Toaster.

Second, both the Toaster and the Broadcaster Elite use the majority of the bandwidth (power) of the computer. Therefore, any simultaneous use of the Toaster and the Broadcaster Elite will result in one or both of them being starved for CPU (computer) time. The result will be erratic or jumpy Toaster effects, and looping playback with the Broadcaster Elite.

The Toaster may be used in the same machine as a Broadcaster Elite to generate LightWave animations. These frames can be placed on the hard drive and the Broadcaster Elite utilities can be used to create the video stream. This would replace a single-frame recorder, and allow animation output in S-Video or component as well as composite.

Other Amigas - A3000/A3000T

Q. Can I use the Broadcaster Elite in an Amiga 3000 or 3000T?

A. Yes. See the Installation chapter for details on how to configure an A3000 or A3000T to work properly with the Broadcaster Elite.

Can I Adjust Resolution?

Q. Can I adjust the resolution of the Broadcaster Elite?

A. Currently there is no way to adjust the digital resolution of the Broadcaster Elite. The CCIR 601 standard for video resolution is used throughout the board. This specification identifies 13.5 MHz pixels for 720 pixels per line. The vertical resolution is a function of the data compression chips which require a vertical number divisible by 8 lines per field (16 lines per frame). This leads to the standard resolutions of 720 x 480 for NTSC, and 720 x 576 for PAL.

Drive Speed

Q. The results from running the SpeedTest program differ from the manufacturer's speed specifications.

A. Manufacturer's specifications often refer to burst transfer rates or apply only to the faster outer tracks of the drive. For example, the manual of the Seagate ST12550N shows a 10MB/sec burst transfer speed. But real world testing with the Fastlane controller shows that the you can actually expect 5.5MB/sec when writing to the outer tracks.

If you have a Barracuda that is getting less than 5.5MB/sec or you think your drive may not be up to speed, please feel free to call us with your questions. This will be addressed in the Troubleshooting Appendix of the final manual.

Looping Video

Q. I get repeating loops of video when playing back a compiled animation. Why?

A. The system must be able to support a data throughput rate that allows the video data to be fed to the Broadcaster Elite in real time. If this data throughput is insufficient, the Broadcaster Elite will finish playing loaded frames before the next series of frames has finished loading. At this point the board must stall while the next set of frames is loaded. Since it must display something, it repeats the frames it already has loaded.

When compiling an animation, it is imperative that the data rate not exceed the throughput of the computer system which will play back the animation. To determine the data rate, the size of a typical compressed field can be multiplied by 60 (50 for PAL). If this rate exceeds 90% of the data rate indicated with the included SpeedTest utility, the compression must be increased to ensure loop-less playback.

For example, a typical A4000 system with a Fastlane and a Seagate Barracuda ST12550N averages about 5.3 MB/sec transfer rate. This means that it cannot support individual fields greater than approximately 80 KB (95 KB in PAL) without looping during playback. It is a good idea to pre-process the most complex bit of an animation to determine its size before committing to process an entire animation.

Video keeps playing...

Q. When playing back low quality video or black and pressing stop, the video does not stop immediately. Why?

The type of memory that is used on the Broadcaster Elite is FIFO. When video data is transferred from the hard drive to the Broadcaster Elite FIFOs, it is done in large chunks. When playing low quality video or black, that amount of necessary data to transfer is much less. When

playing, data is being transferred continuously. So, when the stop button is clicked, the data transfer is continued until the FIFO is empty.

Audio stopped working...

Q. I edited some audio Samples with the Studio 16 software and my audio doesn't play anymore.

A. If you use V3.0 of the Studio 16 software, you must reboot the Amiga before you run the Producer software. The studio.library of V3.0 is not compatible with the Producer software and the Amiga must be reset to remove it from memory.

If you edit an audio Sample that is part of a Synced Video/Audio pair, it must remain the same overall length if you wish to reload it with its mating JStream into the Producer software.

If you edit an audio Sample in the V3.0 Studio 16 software, you must save it as a V2.0 file.

Appendix B: Utilities

ExtractJPEG

The ExtractJPEG utility will quickly pull any given frame (as two fields) from a JStream. The data is copied from the JStream (and is thus non-destructive) into two standard JFIF JPEG files. These files represent the two fields of the chosen frame. Their dimensions will be the same as the frame in width, and half the height of the full frame (ie. NTSC frames are 720x480 and thus its fields are each 720x240). Any program capable of loading standard JFIF JPEG files can then load and process these fields.

Usage: ExtractJPEG <JStream-name> <frame-number> [filename]

JStream-name is the JStream to extract the frames from and must be supplied. The JStream-name should include the path to the file.

Frame-number is the frame to extract and must be supplied. A frame number greater than the number of frames in the JStream will extract the last frame.

Example: ExtractJPEG DBC1:MyVideo.jst 1800

This would extract the 1800th frame as two fields named MyVideo.jf0 and MyVideo.jf1 and put them on drive DBC1:.

Filename is optional, and if given, the extracted fields will be given this name (and path) with the extensions ".jf0" and ".jf1". Otherwise extracted fields will be given the name of the source JStream file plus the extensions ".jf0" and ".jf1" to indicate the even and odd fields respectively.

Example: ExtractJPEG DBC1:MyVideo.jst 1800 RAM:F1800

This would extract the 1800th frame as two fields named F1800.jf0 and F1800.jf1 and put them in the RAM: disk.

Append JPEG

AppendJPEG allows you to append frames (as a pair of fields) to a JStream. If the JStream does not exist, it is created. Otherwise, the fields are appended to the end.

Most significantly, any frames extracted with ExtractJPEG can be added with AppendJPEG. Frames appended to an existing JStream must be of the same Quality level as the existing frames. (See the section on Quantization tables below.)

Usage: AppendJPEG <JStream-name> <fieldname>

JStream-name is the file to be created or appended to and should include the path to the file. You should include the ".JST" suffix in the JStream-name. Fieldname is the name of the fields to be added less the ".JF0" and ".JF1" suffix.

Example: AppendJPEG DBC2:NewFile.jst RAM:F1800

This would create a new JStream named "NewFile.jst" if it did not already exist and append the fields F1800.jf0 and F1800.jf1 that are located in the RAM disk.

Using fields created by other means is a bit more complicated. This will be covered in the final manual in the Creating JStream Compatible Frames section.

ExtractJST

ExtractJST allows you to conveniently extract frames from JStreams. The extracted frames can be saved out as a sequential series of JPEG fields or as a JStream. Double-click on the icon to open the ExtractJST window.

Select the JStream to work on by clicking on the F button in the upper left corner. This will open a standard system file-requester for selection of the JStream.

The total number of frames in the selected JStream will be displayed in the text field labeled "Frames". The input fields labeled "Beg Frame" and "End Frame" will automatically default to the first and last fields. You can change these values to select the desired range of frames to extract.

The output directory and base filename are chosen by clicking on the F button in the lower left corner of the window. The selected path and filename is displayed in the text field in the bottom.

WARNING: Do not extract using the Field output format to a different DBCDOS drive. Use either the same drive or a non-DBCDOS drive for storing the output files. When extracting to any of the other formats, a DBCDOS partition may be used.

Directly below the frame number input fields is a cycle gadget labeled "Extract to:". This gadget allows you to select the format in which to extract the frames. There are six possible choices:

1. Fields: Each frame is extracted to a pair of fields in JFIF JPEG format. The fields will be saved as NAME.###.JF0 and NAME.###.JF1. Where NAME is the filename chosen through the file-requester and ### represents the frame number.

2. JStream: The selected range of frames is extracted to a new JStream and saved with the selected filename.

3. SloMo 1/2: The selected range of frames is extracted to a new JStream but the original frames have been expanded out to result in 1/2 the playback speed of the original.

4. SloMo 2/5: The selected range of frames is extracted to a new JStream but the original frames have been expanded out to result in 2/5 the playback speed of the original.

5. SloMo 1/3: The selected range of frames is extracted to a new JStream but the original frames have been expanded out to result in 1/3 the playback speed of the original.

6. Reverse: The selected range of frames is extracted to a new JStream in reverse order. The resulting JStream will be one frame less in length than the number of frames selected as the first and last fields must be discarded.

WCPT (Write Cache Page Tool)

See the AmigaGuide document for WCPT in your Producer:Tools/ drawer.

Speedtest

Speedtest tests the read and write performance of the given volume by simulating the transfer of data between the Elite's onboard FIFOs and the drive as it would be under record and playback conditions.

Speedtest is a shell-based utility.

Usage: Speedtest <volume>

Speedtest will return the approximate read and write speed of the drive in bytes per second.

The chosen volume must have 4 megabytes of free space available to complete the test. Speedtest is non-destructive so you can use it on partially full volumes and the resulting speed ratings will reflect the transfer rates possible with the current drive space available.

ImageFX Loaders/Savers

A preliminary ImageFX V2.0 JStream saver is supplied with the Producer software. An ImageFX V2.0 JStream loader is being developed and will be available soon.

Saver - This allows you to create a new JStream or append to an existing JStream. Your source image must already be the correct size for the display format: NTSC 720x480, PAL 720x576. When used from the ImageFX interface you will be prompted for a reference JStream to establish a quality setting. The reference JStream must be supplied. When you are appending to an existing JStream you can use the existing JStream

as the reference. This is compatible only with ImageFX V2.0.

ADPro Loaders/Savers

The JPEG saver included with ADPro will save JStream compatible JPEG JFIF files that can be used with AppendJPEG to create JStreams. This feature of the ADPro JPEG saver is only available through ARexx. Please consult your ADPro V2.5 manual.

MakeGraph

Only audio files recorded through the Producer interface will have audio graphs. To make an audio graph for audio clips captured through the Studio 16 software, you can use the supplied Makegraph utility. Makegraph is in your Producer:Tools/ directory and should be in the command path for your Shell.

How To Make Graphs For Existing Audio Files

Usage: MakeGraph <filename less extension> 44100 <fps>

Filename should include the full path. FPS is the frames per second appropriate to the video standard, ie. 25 or 30.

Example: MakeGraph audio:MyAudioFile 44100 30

This will make the audio graph file called MyAudioFile.ag on your Audio: partition appropriate for NTSC video.

Appendix C: JPEG

JPEG Compression

JPEG stands for Joint Photographic Experts Group, which is the name of the original committee that developed the standard for the digital compression and coding of continuous-tone still images. The JPEG standard covers a variety of image formats, compression schemes and coding methods. The Broadcaster Elite hardware supports extended sequential DCT-based Huffman coding for 8-bit source images according to the JPEG-9-R7 standard.

The Elite works on YCbCr image data rather than RGB which is typical in computer graphic applications. The chrominance components are further downsampled per CCIR 601 to 4:2:2 YCbCr. The Y component of the data represents the luminance part of the image and the Cb and Cr components are the chrominance or color information for the image.

The JPEG compression process is made up of several different operations. First is the Discrete Cosine Transform or DCT of the YCbCr image data. This is followed by Quantization and re-ordering of the resulting coefficients from the DCT step. These results are both run-length encoded and Huffman encoded.

The DCT process converts the pixel data of the image into frequency coefficients. It does this on an 8x8 block of pixels at a time and the results of the DCT are an 8x8 block of frequency coefficients. When working with low quality settings you can see the boundaries of these 8x8 blocks on the reconstructed image. This is also why corrupted JPEG images often have a very blocky appearance.

Example block of pixel data. Values range from 0 to 255 but, like most images, within an 8x8 area the values often do not vary by much.

```
140  144  147  140  140  155  179  175
144  152  140  147  140  148  167  179
152  155  136  167  163  162  152  172
168  145  156  160  152  155  136  160
162  148  156  148  140  136  147  162
147  167  140  155  155  140  136  162
136  156  123  167  162  144  140  147
148  155  136  155  152  147  147  136
```

The same data after a DCT has been performed on it.

```
 151  -18   14   -9   23  -10  -14  -19
  20  -35   26   -9  -11   10   13    7
 -11  -24   -2    6  -19    3  -21   -1
  -9   -5   14  -15   -9   -3   -4    8
  -4    9    7    1  -11   17   18   15
   3   -3  -19    8    8   -4    0   -7
   8    0   -3    3   -2   -8   -2   -2
   0   -8   -3    1    1    4   -7    0
```

The most important information to the reconstruction of the image data is found in the upper-left element of the matrix. As you move away from it diagonally towards the lower right, the elements contribute less and less to the image. This is very important for the next step.

The next step is referred to as Quantization and this is where the quality selection takes place. The frequency coefficients resulting from the DCT process are quantized and re-ordered into the decreasing order of visual importance. There are 64 coefficients in the 8x8 block and these are quantized individually with 64 quantization values. These 64 quantization values are referred to as quantization tables and a separate table is used for the luminance and chrominance components of the image.

This is an example luminance quantization table as given in the book "JPEG - STILL IMAGE DATA COMPRESSION STANDARD". This table will give results close to what you will get with the Elite's Draft 2 setting.

Luminance Quantization Table:

```
 16   11   10   16   24   40   51   61
 12   12   14   19   26   58   60   55
 14   13   16   24   40   57   69   56
 14   17   22   29   51   87   80   62
 18   22   37   56   68  109  103   77
 24   35   55   64   81  104  113   92
 49   64   78   87  103  121  120  101
 72   92   95   98  112  100  103   99
```

The quantizing step divides each element in the DCT block by its corresponding quantization value in the quantization table.

Data after quantizing:

```
  9   -2    1   -1    1    0    0    0
  2   -3    2    0    0    0    0    0
 -1   -2    0    0    0    0    0    0
  0    0    1   -1    0    0    0    0
  0    0    0    0    0    0    0    0
  0    0    0    0    0    0    0    0
  0    0    0    0    0    0    0    0
```

As you can see, many of the coefficients have been reduced to zero and when the reverse process is applied, they will remain zero. This is the lossy part of the JPEG process. JPEG compression relies upon the fact that these frequencies are the least important in the reproduction of the image when viewed by the human eye.

The quantized values are then re-ordered and passed to the Huffman encoder. The re-ordering is done with a zig-zag pattern that results in the most important coefficients at the beginning of the run of 64 values and

the least important at the end.

Zig-Zag pattern for re-ordering the quantized coefficients.

```
 0   1   5   6  14  15  27  28
 2   4   7  13  16  26  29  42
 3   8  12  17  25  30  41  43
 9  11  18  24  31  40  44  53
10  19  23  32  39  45  52  54
20  22  33  38  46  51  55  60
21  34  37  47  50  56  59  61
35  36  48  49  57  58  62  63
```

Result after zig-zagging.

9,-2,2,-1,-3,1,-1,2,-2,0,0,0,0,0,0,1,0,0,0,1,0,0,0,0,0,-1,...,0

Notice that the last 39 values in the run are zero. This is important in the next part.

The 64 values resulting from quantization and zig-zagging are passed to the Huffman encoder. The Huffman encoding process is complex and we only need to know that through a combination of run-length and entropy encoding, the first 25 values will be stored in only a few bytes while the 39 zeroes will be stored in as little as 4 bits. The Huffman part of the JPEG process is lossless. The very same values will be reproduced by the decoding process.

This is how the JPEG process can obtain such high compression rates while maintaining high image quality.

Appendix D: JStream

JStream IFF Format

The JStream contains the JPEG quantization tables, information about number of frames and image size, the actual JPEG compressed video data, offset tables, field size information and timecode references.

It's a good idea to give JStreams a ".jst" extension, because only JStreams with a .jst extension can be loaded into the Producer software.

The JStream is in standard IFF format:

FORM (IFF identifier)
<form length> (ULONG; length of file - 8)
DBJS (Digital Broadcaster JStream)

Mandatory chunks:

NMFR (NuMber of FRames)

Note: This chunk should appear BEFORE the DATA chunk.

0x00000004 (length of ULONG)
<# of frames> (ULONG)

ISIZ (Image SIZe)

Note: This chunk should appear BEFORE the DATA chunk.

0x00000004 (length of two UWORDs)

<height in pixels> (UWORD)
<width in pixels> (UWORD)

YTAB (Luma (Y) quantization TABle)

Note: This chunk should appear BEFORE the DATA chunk.

0x00000040 (length of table)
<quant table> (64 UBYTEs)

CTAB (Chroma quantization TABle)

Note: This chunk should appear BEFORE the DATA chunk.

0x00000040 (length of table)
<quant table> (64 UBYTEs)

DATA (JPEG DATA chunk)

Note: We HIGHLY recommend that this chunk be LONG WORD ALIGNED to maximize transfer speed during playback.

<data size>(length of data)
<JPEG data> (JPEG compressed data for all frames)

- **Each field is stored sequentially.**
- **The data is encoded from 4:2:2 YUV.**
- **The JPEG data uses the Huffman entropy encoding method with standard tables.**
- **The Huffman encoded data is NOT byte stuffed.**
- **The last long word of data in a field is padded with binary 1s to maintain long word alignment.**
- **Each field is followed by 4 long words of 0xFFFFFFFF as a requirement of the playback hardware.**

OFFS (Frame OFFSets into the DATA chunk)

Note: This chunk should occur AFTER the DATA chunk.

<size of offsets> (number of frames * 4)
<frame offsets>

- **Frame offsets into the DATA chunk referenced from the data size - i.e. the first reference is ALWAYS 0x00000004. There is one long word offset for each frame in the JStream.**

FLSZ (FieLd SiZes)

Note: This chunk should occur AFTER the DATA chunk.

<size of sizes> (Number of frames * 8)
<field sizes> (ULONGs field sizes for each field in the JStream)

- **This field size includes the 4 long words of 0xFFFFFFFF at the end of each field.**

Optional JStream specific chunks:

SMPT (SMPTE timecode information)

Note: This chunk should occur AFTER the DATA chunk.

<size of SMPTE data> (Number of frames * 8)
<SMPTE data> (SMPTE code for each frame)

- **SMPTE data is stored in the data format of the ICS2008 chip used for SMPTE.**
- **SMPTE data includes users bits.**

- **There are two long words of data for each frame.mm**

AUDI (AUDIo file for reel)

<size of filename> (size of base audio filename including path)
<filename> (null terminated ASCII string)

- **example: "AUDIO:MyAudioFile"**
- **This chunk should only be added by the Producer software.**

Other optional chunks:

AUTH (Standard IFF AUTHor chunk)

Note: We recommend that this chunk be placed before the DATA chunk, and that it be padded out to a multiple of 4 for long word alignment.

<size> (size of author descripton)
<author info> (ASCII string with author information)

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