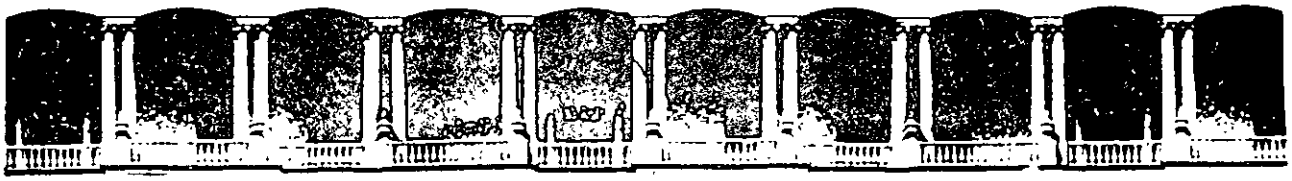

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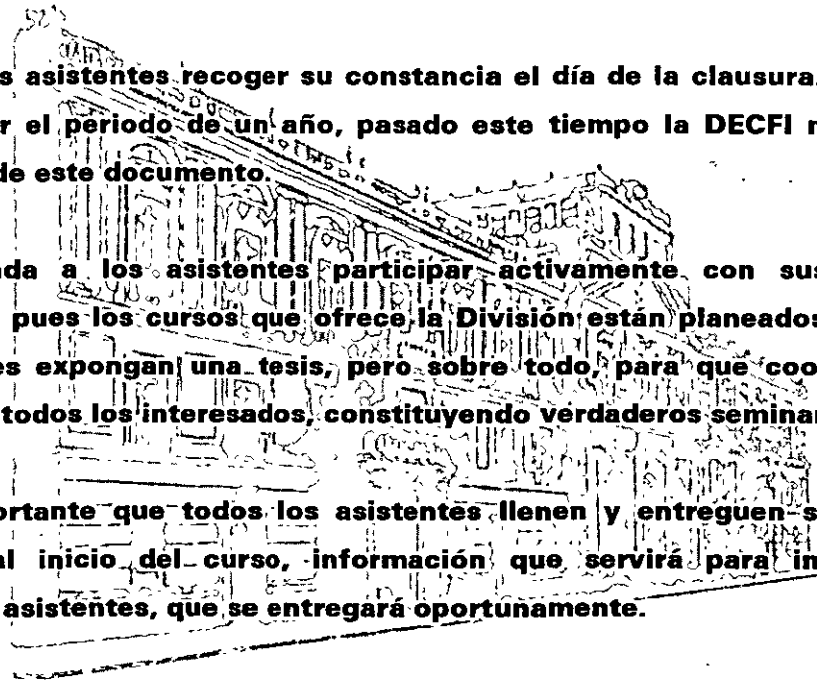

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Con el objeto de mejorar los servicios que la División de Educación Continua ofrece, al final del curso deberán entregar la evaluación a través de un cuestionario diseñado para emitir juicios anónimos.

Se recomienda llenar dicha evaluación conforme los profesores impartan sus clases, a efecto de no llenar en la última sesión las evaluaciones y con esto sean más fehacientes sus apreciaciones.

Atentamente

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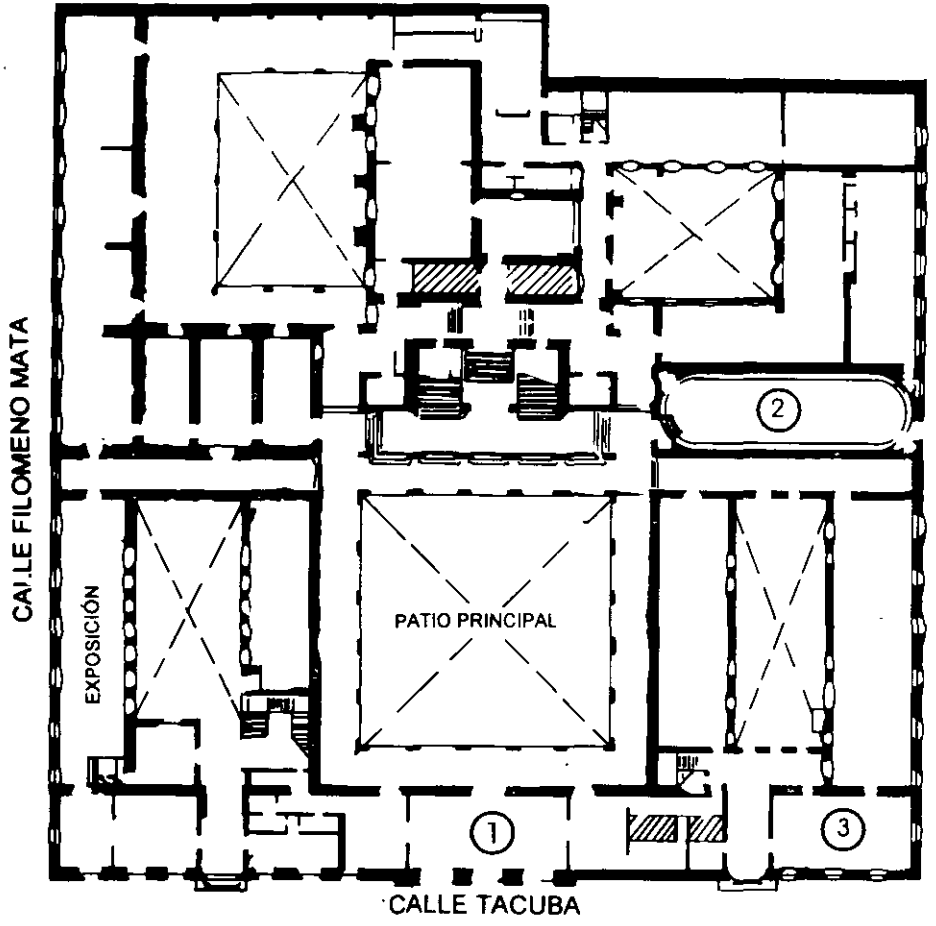

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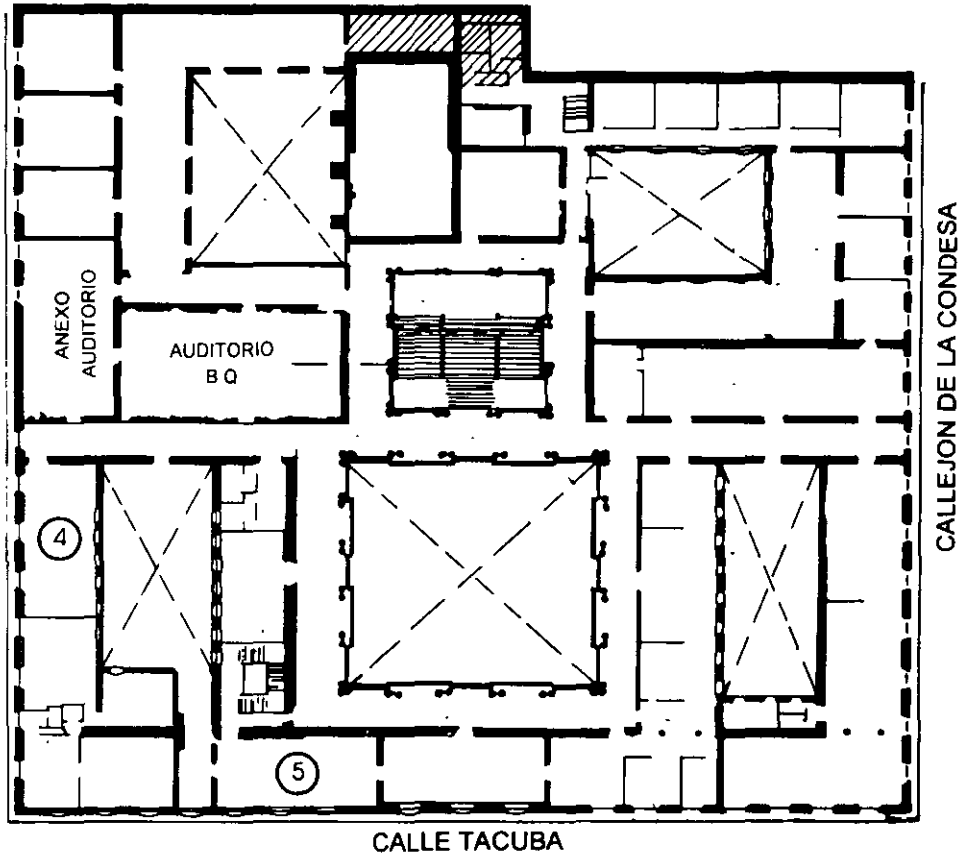

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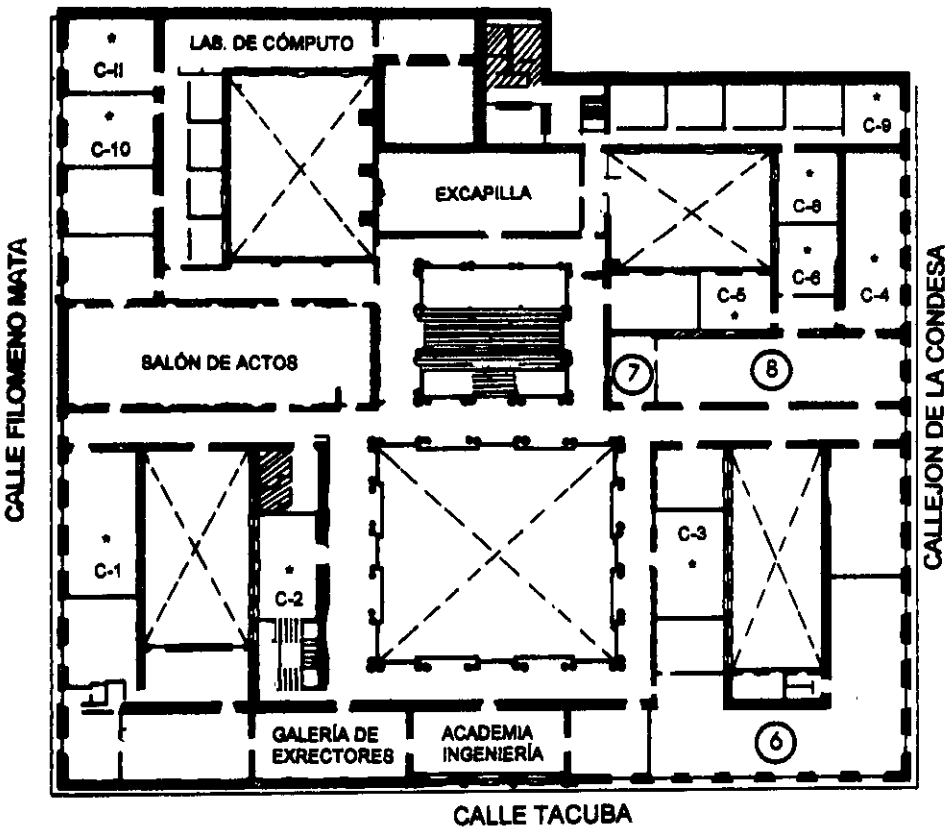

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FACULTAD DE INGENIERIA U.N.A.M.
DIVISION DE EDUCACION CONTINUA

Edición de Archivos Digitales de Audio y Video

(CC061)

Instructor:
Ing. Eduardo Ordúñez Segura

Agosto de 1998

INTRODUCCIÓN

Multimedia es la combinación de medios. Es la combinación de texto, gráficas, sonido y video para presentar información, No basta únicamente con combinar medios electrónicos, la Multimedia se crea cuando logramos conjuntar varios medios, entre ellos:

- El sonido (de un león que aparece en el monitor de la computadora)
- La imagen en movimiento (de un avión que rápidamente se desplaza por el aire)
- Las gráficas (con animación que muestran el rendimiento y la productividad de una empresa)

El sonido, el vídeo, el texto y las animaciones son objetos empacados en archivos de datos que son controlados por algún programa o manejador de objetos y son presentados en secuencia o con un orden dictado por el usuario. Cuando un sistema Multimedia da control al usuario utilizando algún medio interactivo éste puede estimular sus ojos, oídos y mente para poder sentir la transformación de los objetos presentados en pantalla o en algún otro dispositivo de salida.

Las sensaciones que se inducen en el usuario provienen en su mayoría de el audio y el video que se le presenten, y a la vez son un ejemplo claro de que se puede llamar multimedia y lo que no, cuando una aplicación presenta conjuntamente imágenes y sonidos, coordinados y coherentes, podemos decír que es una apliación multimedia, si presentara independientemente, y sin congruencia el audio, las imágnes y el video, podríamos hablar de manejo electrónico de medios, no de multimedia.

Existen dos tipos de sistemas multimedia:

- Multimedia Interactiva: Cuando se le permite a un usuario final controlar ciertos elementos y cuando deben presentarse.
- Hipermedia: Cuando el sistema proporciona una estructura de elementos ligados a través de los cuales el usuario puede navegar por el sistema (Dado que aún exíste ambigüedad en los términos, aún es posible confundír el término Hipermedia con Macromedia).

Macromedia e Hipermedia pueden ser idénticos en todo, exepto que Macromedia se refiere a una transmisión de los medios a un nivel global (como internet), mientras que Hipermedia puede hacerlo a un solo usuario en una sola máquina.

EQUIPO HUMANO QUE DESARROLLA MULTIMEDIA

Actualmente existen muchas especificaciones para el personal que labora en el campo de la Multimedia, pero, una encuesta realizada en la Universidad de San Francisco define las actividades y responsabilidades de un equipo de producción y desarrollo Multimedia:

- Gerente de Proyecto.
- Diseñador de Multimedia.
- Escritor.
- Especialistas en Vídeo.
- Especialistas en Audio.
- Programador de Multimedia.

Estas divisiones no limitan que un escritor no conozca y realice el trabajo del programador de Multimedia, o que un diseñador de Multimedia evite crear pistas de vídeo para un proyecto. Generalmente las responsabilidades son compartidas y se toma la experiencia de todos los miembros del proyecto. (ver anexo A).

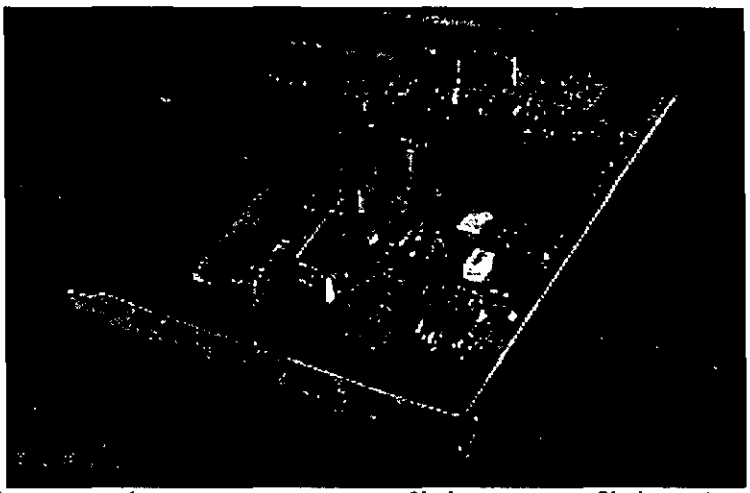
Todas las personas que desarrollen alguna de estas actividades son muy importantes en la realización de un proyecto multimedia, sin embargo, la textura, la comodidad y en general, la presentación que se dará al usuario final dependerá únicamente de los Especialistas en Audio y Video. Es por ello, que vale la pena hacer el esfuerzo por tener las mejores herramientas para el desarrollo de estas aplicaciones, que mercadológimamente, son el punto central de las aplicaciones.

EDICIÓN DE AUDIO DIGITAL (la física del sonido)

ANTECEDENTES

La primer tarjeta de sonido en el mercado de computadoras apareció justo en el momento en que la bocina del sistema 8086 u 8088 era aburrida y monótona. Está tarjeta de sonido la ADLIB, permitía escuchar verdadera música en la computadora, interactuar con juegos, reproducir señales de error sin escuchar el famoso "beep" del sistema, etc. Poco después apareció en el mercado una tarjeta que superaba las capacidades de reproducción de la ADLIB, la sound blaster. De entonces a la fecha, varias compañías de computo han lanzado al mercado sus productos cuyas funciones principales se describen a continuación :

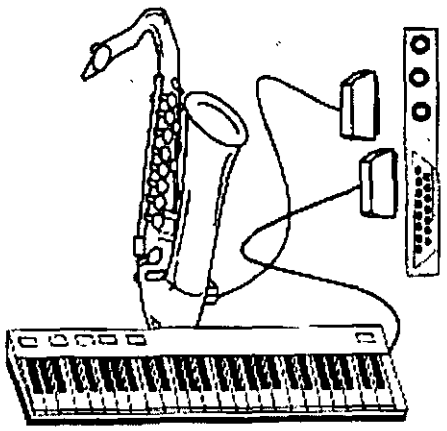
La tarea más importante de una tarjeta de sonido consiste en capturar con calidad aceptable las señales procedentes del exterior, ya sea a través de un micrófono o de cualquier dispositivo capaz de generar una señal de onda, como un equipo de música o similar. Además de capturarlos, debe ser capaz de reproducirlos, es decir, generar una señal muy parecida a la



original. Asimismo, puede tener soporte monofónico, estereofónico y/o multicanal.

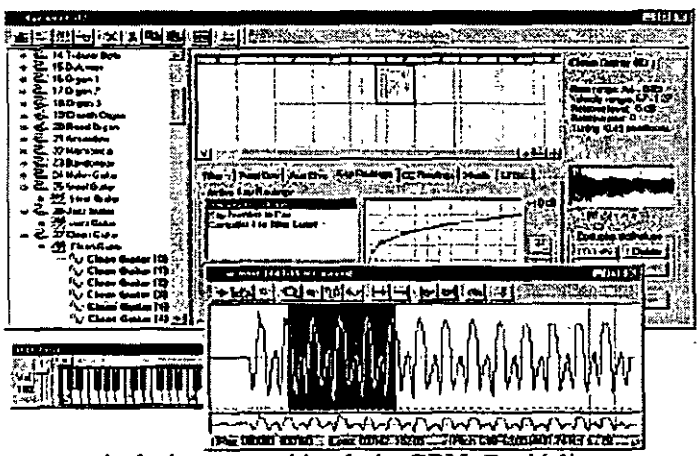
Una tarjeta de sonido es una tarjeta de expansión que se instala dentro de la computadora. Si solo se utiliza la bocina de la computadora y se administra con el controlador de Windows, todas las operaciones de la computadora quedan suspendidas mientras se reproduce el sonido. Este tipo de controladores hacen que la CPU inspeccione la generación de sonido, mientras que una tarjeta de sonido hace este trabajo y esto libera a la CPU para que realice otras operaciones. La instalación de una tarjeta de sonido se realiza en las ranuras de expansión de la computadora.

La mayoría de las tarjetas de sonido permiten la entrada para puertos estero, micrófono MIDI, etc. los puertos de entrada de estéreo y micrófono, permiten que la tarjeta de sonido grabe voz y música. Como se muestra a continuación, se puede conectar a la tarjeta de sonido un estéreo, una televisión o un micrófono externo. La entrada MIDI de la tarjeta de sonido permite que se pueda digitalizar y almacenar sonido de algún instrumento MIDI.



Como se analizará más adelante, una forma de onda debe ser convertida a un formato digital para ser utilizada en la PC. Para ejecutar estas conversiones, la tarjeta de sonido contiene un convertidor analógico digital. Igualmente, para enviar sonido de salida a las bocinas o a otros aparatos, la tarjeta de sonido debe convertir la representación del sonido digital de la computadora otra vez al formato analógico utilizando un convertidor digital analógico.

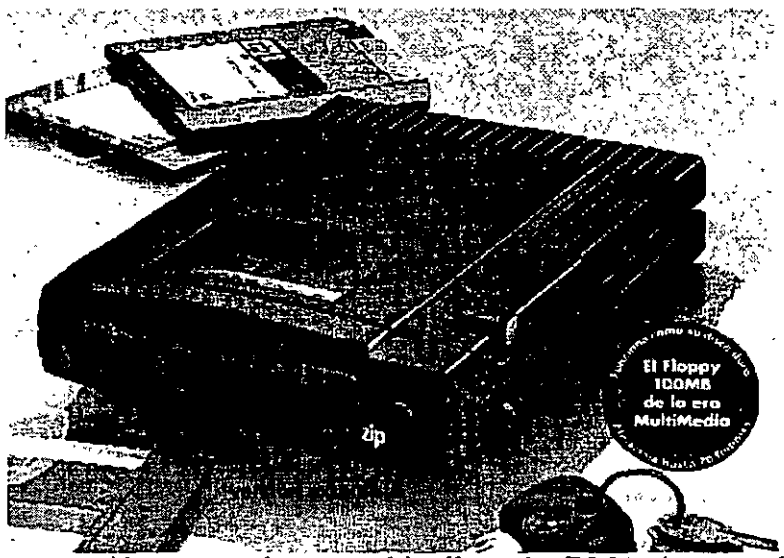
El IRQ es una abreviación para petición de interrupción (Interrupt ReQuest). Algunos dispositivos en la computadora como unidades de disco, o la misma tarjeta de sonido, son



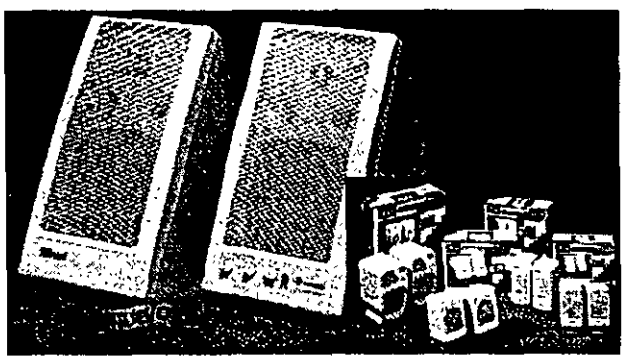
capaces de ejecutar tareas sin la intervención de la CPU. Periódicamente estos dispositivos deben interrumpir a la CPU y pedirles que ejecuten algún proceso para ellos. Para interrumpir a la CPU, estos dispositivos les envían señales mediante los cables llamados líneas de petición de interrupción. Cada dispositivo utiliza su propia línea. Cuando se instala una tarjeta de sonido, se debe seleccionar una línea de petición de interrupción que no sea utilizada por otro dispositivo. Si dos dispositivos utilizan la misma línea, el sistema se bloqueará.

Noy hay una IRQ fija o establecida para estos dispositivos, la IRQ recomendada para la tarjeta de sonido es la que se instale por default con el sistema de instalación automática o alguna de las que se tenga la seguridad de que no esta siendo utilizada por otro dispositivo.

Para enviar grandes cantidades de datos a los dispositivos de alta velocidad, la computadora tiene dos opciones: La primera, la CPU puede inspeccionar la transferencia moviendo los datos desde la memoria al dispositivo. Desafortunadamente, mientras la CPU está moviendo los datos, no puede ejecutar otros trabajos útiles, y el desempeño del sistema disminuye.



La otra opción es emplear un chip llamado DMA (acceso directo a memoria) para ejecutar la transferencia de datos. Debido a que varios dispositivos pueden necesitar transferirlos simultáneamente, la computadora proporciona muchos caminos para datos (llamados canales DMA) sobre los cuales el chip DMA puede transferir los datos. Un canal DMA, por lo tanto, es una vía de alta velocidad para transferir datos a o desde un dispositivo. Como era el caso con las IRQ, debe ser seleccionado un canal DMA para la tarjeta de sonido. Este canal puede ser compartido por varios dispositivos, pero se tiene que tener la certeza que solo será utilizado por un dispositivo al mismo tiempo.



Otra función de una tarjeta de sonido es la de soportar la reproducción y comprender las partituras MIDI, cuyos sistemas son:

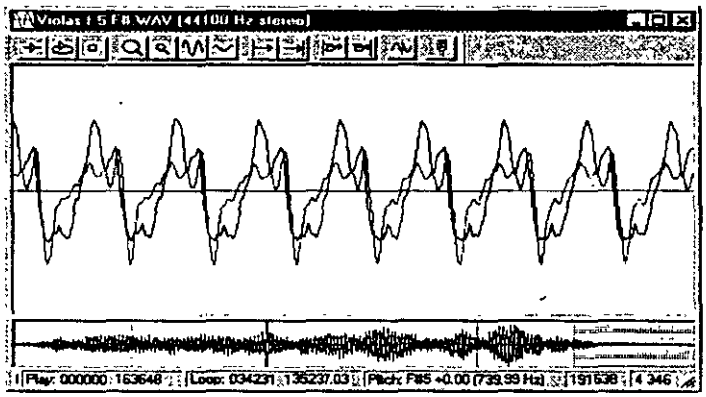
- Generación por F.M.
- Síntesis por tabla de onda

La tarjeta Sound Blaster podía reproducir cualquier tipo de sonido con calidad superior a la ADLIB. Poco a poco fue ganándose a los usuarios de multimedia y se convirtió entonces en el estándar de las tarjetas de sonido.

Estas tarjetas de sonido utilizaban la tecnología de generación de sonidos, una técnica denominada modulación de frecuencia . Dicha técnica consiste en la modificación de una señal

fija sobre otra que varia su frecuencia según determinados parámetros contenidos en una tabla de datos interna. Dependiendo de la tecnología empleada, era posible la utilización de un número de voces o canales determinados.

La nueva tecnología se llama tabla de ondas. Este sistema consiste en la previa digitalización de una nota de los instrumentos musicales, que son almacenados en un formato deseado y determinado por el fabricante de la tarjeta.



Dependiendo de la calidad de la señal digitalizada y la potencia del circuito reproductor, se pueden obtener señales de 16 bits y 44.1 KHz. o superiores.

Desde las 8088 ya era posible la captura y reproducción de sonidos en la computadora, pero la calidad dejaba mucho que desear. El oido humano tiene un espectro de frecuencias que va desde los 20 Hz hasta los 20 KHz aproximadamente, y la frecuencia de muestreo debe tener un valor mínimo del doble de ancho que la del oído. Teniendo en cuenta estos aspectos, es fácil calcular que una digitalización debe realizarse a una frecuencia de 44.1 KHz o superior para poder obtener el total del espectro de la banda de audio.

Desde entonces muchos fabricantes luchan por ganarse más y más usuarios evolucionando las capacidades de las tarjetas pero manteniendo en el mismo nivel la estandarización de los equipos.

El tamaño de los archivos que contienen los sonidos digitalizados está en proporción con la calidad de la captura de sonido: a mayor frecuencia de digitalización mayor consumo de espacio de almacenamiento. Para reducir el tamaño de estos archivos se emplean distintas técnicas, algunas de hardware y otras de software:

- Las tarjetas suelen incluir uno o varios circuitos denominados DSP (procesador digital de señal), que se encargan de comprimir la información antes de ser grabada en el disco.
- Adaptative delta pulse code modulation (adpcm). Se basa en almacenar unicamente la diferencia existente entre cada muestra y su predecesora.
- A-law es un sistema que, aprovechando que la mayor parte de la información es de carácter bajo, utilizando una resolución de 13 bits la almacena en 8 bits.
- M-law, sistema igual que el anterior no lineal. Resolución de 14 bits y almacenamiento en 8 bits.

Como cualquier otra tarjeta necesita unos parámetros para su configuración. Dichos parámetros son:

- Dirección de funcionamiento.

- IRQ de control.
- DMA para transferencias.
- Un slot libre en función de la capacidad de muestreo (8 ó 16 bits).
- Espacio en el disco duro para la instalación de software.

Una onda de sonido se produce cuando se habla, se enciende la radio o se habla por teléfono. Como se muestra en la siguiente figura, está onda entra por el oído y causa que el tímpano vibre.

Cuando hablamos por teléfono una onda de sonido es transmitida por los cables del teléfono. Ya hace algún tiempo, el medio más común para almacenar formas de onda es por señales magnéticas. La información representada por una onda continua es llamada datos analógicos. La siguiente figura ilustra los 3 componentes principales de una forma de onda: Para ser de utilidad una señal analógica debe ser medible o de otra manera su contenido no tendría sentido.

La línea base de una señal proporciona un punto para medir el sonido. Observe en la figura, que la línea base corta el sonido exactamente a la mitad. El período de la señal es la cantidad de tiempo que transcurre entre dos picos sucesivos de la onda de sonido.

Normalmente, una onda de sonido tiene miles de picos por segundo. El número de picos define la frecuencia de la señal. Está frecuencia se mide en hertz (Hz), lo que representa evento por segundo o kilohertz (KHz), el cual representa miles de eventos por segundo. Por ejemplo, si una señal tiene 5000 picos por segundo, la señal tiene 5000 Hz ó 5 Khz.

La amplitud de la señal es la distancia de la línea base de la señal a un pico dado. La amplitud determina el volumen de la señal. A mayor amplitud, mayor volúmen.

La señal de audio como se conoce cotidianamente, viaja como una onda analógica (o continua). Su computadora, sin embargo, utiliza señales digitales cuyos valores pueden ser 0 ó 1 como se muestra a continuación:

Antes de que la computadora pueda trabajar con los sonidos, o reproducirlos, la onda analógica debe ser convertida a un formato digital utilizando un proceso conocido como conversión analógica-a-digital. Para convertir la señal analógica, debe tomar muestras de onda a intervalos de tiempo fijos para medir la amplitud de la señal.

El número de muestras tomadas por segundo se conoce como frecuencia de muestreo. La siguiente tabla contiene las tres frecuencias más comunes para conversión de sonido. A medida en que aumenta la tasa de muestreo, mejora la calidad del sonido:

RAZÓN DE MUESTREO	MUESTRAS POR SEGUNDO	CALIDAD DE SONIDO
11.025 KHz.	11025	BAJA
22.05 KHz.	22050	MEDIA
44.1 KHz.	44100	ALTA

Cada vez que se toma una muestra de onda de sonido, se almacena un valor que representa la amplitud de sonido. Dependiendo de la técnica de grabación que utilice, se graba un valor de 8 a 16 bits. El tamaño de cada valor afecta la calidad de sonido. Si está utilizando un valor de 8 bits, la medición de la muestra de sonido está en el rango de 0 a 255.

Aquí podemos dar un valor de 0 que corresponde a una señal en la línea base y un valor de 255 que corresponde a una señal al volumen máximo. Otros valores corresponden a amplitudes en otros puntos entre la linea base y el valor pico.

Un valor de 16 bits, sin embargo, puede representar una amplitud de señal utilizando valores en el rango de 0 a 65535.

Nuevamente se da que el valor 0 corresponde a la señal en la línea base y el valor 65535 corresponde al volumen máximo.

CONSIDERACIONES DE ALMACENAMIENTO

Para la producción de proyectos multimedia, es necesaria la optimización de todos los recursos del sistema ya que cada objeto en ejecución necesita de una cantidad de memoria para su operación, esto sin considerar la cantidad de espacio que en disco duro está ocupando.

La muestra de una señal analógica requerida para generar una representación digital produce un byte (8 bits) ó 2 bytes (16 bits) de datos por cada muestra. Por ejemplo un minuto de sonido digital llena todo un disquete y una hora de sonido digital de alta calidad ocupa 300 MB. la siguiente tabla contiene la cantidad de espacio en disco consumido por minuto en función de diferentes rangos de muestreo y tamaños de muestra.

RAZÓN DE MUESTREO	TAMAÑO DE LA MUESTRA	BYTES POR MINUTO
11.025 KHz	8 bits	0.66 MB
22.05 KHz	8 bits	1.32 MB
44.1 KHz	8 bits	2.64 MB
11.025 KHz	16 bits	1.32 MB
22.05 KHz	16 bits	2.64 MB
44.1 KHz	16 bits	5.29 MB

Los canales de grabación que intervienen en la digitalización de una señal de sonido, afectan directamente la calidad, la nitidez y la limpieza de la señal. Generalmente un canal es simplemente un cable capaz de conducir una señal. Cuando se graba sonido, se pueden colocar varios micrófonos en distintas localizaciones, esto permite que se grabe el sonido desde distintas direcciones. Cuando se reproduce el sonido después, se pueden combinar los canales para producir un sonido estereofónico. pero eso si, entre mayor sea el número de canales de una grabación de sonido, mayor será el costo final de la grabación.

Debemos considerar que debido a la enorme cantidad de información que genera un archivo de sonido digital, el disco compacto se convierte en su medio de almacenamiento casi obligatorio. A menudo en el CD-ROM podemos encontrar los términos COMPACT DISC DIGITAL AUDIO (CD-CA) o RED BOOK AUDIO (libro rojo de audio). Estos términos describen la calidad del sonido que fue almacenado, generalmente a 16 bits con una razón de muestreo de 44.1 KHz.

Para una buena optimización de los recursos, no debemos emplear sonidos creados con muestras de 16 bits con una razón de muestreo de 44.1 KHz, ya que ocupan una enorme cantidad de disco duro. Tampoco debemos utilizar sonido digital creado con muestras de 8 bits con una razón de muestreo de 11.025 KHz, debido a que la calidad podría compararse con la de una estación de radio A.M. mal sintonizada. La mayoría de los productores multimedia según lo permitan los alcances del proyecto, utilizan muestreos de 16 bits con razón de muestreo en 22.05 KHz, porque la calidad que se produce es aceptable y el consumo de almacenamiento logra reducirse considerablemente.

HERRAMIENTAS DE EDICIÓN DE AUDIO

LA GRABADORA DE WINDOWS

***Ver anexo ""D"

COOL - EDIT

Para empezar lo primero que debemos saber es que el sonido digital, tanto el que podemos encontrar en Internet como en las computadoras en general, es una colección de unos y ceros (1,0) almacenados en un depósito.

Si se quiere grabar directamente en CoolEdit desde el CD de la computadora hay que abrir el programa e ir a File, New para crear un nuevo archivo o pista de sonido. Cuando aparezca una ventana de opciones hay que hacer lo siguiente en cada una de ellas: en Sample rate seleccionar la opción para grabar a 44.1Hz por segundo, y en Channel hacer un clic para que la resolución elija 8 bits.

Con la primera opción que escogió se determina la calidad del sonido que se grabará (en este caso 44.1 equivalente a la calidad que tienen los CD de sonido). Si se desea reproducir un archivo de sonido desde la computadora, ésta es la calidad adecuada, pero si lo que se quiere es colocar el sonido en una página personal en el Web, conviene la opción de 11,025. Observe la siguiente tabla para saber a qué corresponde cada una de las calidades de grabación:

8,000 HZ	Teléfono
11,025HZ	Radio AM
22,050HZ	Radio FM
32,075HZ	Mucho mejor que la calidad de FM
44,100HZ	CD de sonido
48,000HZ	DAT (Digital Audio Tape)

Para la segunda opción elegimos mono, por lo que nuestra información de sonido estará contenida en un solo canal, a diferencia del formato estéreo que tiene dos canales (derecho e izquierdo) para distribuir la información.

A fin de generar sonido para el Web, la opción mono es la más adecuada ya que requiere de menos espacio para su almacenamiento y será mucho más fácil de transferir por la Red.

Pero si piensa generar un archivo para alguna presentación, la opción de sonido estéreo funcionará mucho mejor, ya que la computadora tomará el archivo directamente de su disco duro.

La tercera y última opción, resolución, determina los niveles de sonido que tendrá nuestro archivo. Con 8 bits de resolución nuestro archivo tendrá 256 niveles de volúmen, lo cual es muy superior a lo que la bocina de la computadora puede reproducir (es decir 16 niveles de volúmen, ya que sólo trabaja a 4 bits). Pero si se posee una tarjeta de sonido y bocinas, hay que considerar que se pueden reproducir sonidos de hasta 16 bits. Los CD de sonido tienen esta resolución.

Para grabar una muestra de sonido desde el CD, se debe abrir el panel de reproductor de CD incluido en el CoolEdit:View : CD Player. Además, en la parte inferior del programa se agregará una barra con los botones básicos de cualquier reproductor de discos compactos. Primero oprima el botón de Record (grabar) del Cool Edit y después el botón de Play del CD Player, con el fin de dar un poco de tiempo y no empezar a grabar cuando la pista de sonido ya haya comenzado.

En el momento de detener la grabación, con el botón de Stop, una representación gráfica de las ondas de sonido que usted grabó aparecerá en el área de trabajo del programa. Si se observa bien

se puede apreciar que tiene una partes más altas que otras, las cuales se llaman picos y representan a los sonidos altos. Las partes más bajas, llamadas valles, representan los sonidos más bajos.

Si oprime el botón de Play, además de escuchar en las bocinas lo que ha grabado verá un gran cursor recorrer todo lo largo de nuestra muestra de sonido. El movimiento de este cursor indica cuál es la parte gráfica correspondiente al sonido que se está reproduciendo en ese momento, si lo sigue con la mirada identificará qué picos corresponden a qué sonidos, así como los valles. Al ir a la Opción : Loop ,Mode notará como el botón de Play cambia a Loop. Al oprimirlo, la muestra de sonido que ha grabado se repetirá infinitamente hasta que oprima el botón de Stop o regrese al modo de play.

Tambien puede lograr que sólo una parte de lo grabado sea reproducida, para hacerlo, seleccione con el mouse a parte de su interés y oprima el botón de Play.

Ahora oprima el botón Zoom y verá comola forma aumenta de tamaño. Oprima el botón cuantas veces sea necesario hasta llegar a una simple línea dentada, si intenta oprimir el botón de Play, lo único que escuchará será ruido. Dado que nos hemos acercado mucho a la onda de sonido, es imposible que se reproduzca algo armonioso, pero si oprime el botón de Zoom out verá cómo se aleja de la forma de sonido. Seleccione alguna parte de su sonido y juegue con estos botones para ver como son representados con exactitud ciertos sonidos.

Primero seleccione el fragmento que más le guste, procure ser exacto en la selcción, para lo cual nos servirán las herramientas de Zoom in y Zoom out. Cuando tenga seleccionado su fragmento, cópielo y péguelo en una nueva ventana CoolEdit, para abrirla diríjase a File New Instance.

Ya realizado esto, es tiempo de hacer los efectos, los más simples son dos: fade in y fade out, que se refieren al fenómeno de amplificar el sonido ya sea incrementándolo (fade in) o reproduciéndolo (fade out). Ahora haremos un fade-in al principio de nuestro archivo de sonido y un fade out al final. Seleccione una pequeña parte al principio del archivo (procure que no sea tan pequeña, ya que el efecto no se escuchará correctamente) y vaya a Transform : Amplify

*** *Ver el anexo "C" para consultar el manual de este paquete y todas las opciones*

EDICIÓN DE VIDEO DIGITAL

La pantalla de la computadora está hecha de pequeños puntos llamados pixeles o elementos de una imagen. El número de pixeles en una imagen define su resolución. Mientras más pixeles tenga la pantalla, mayor será su resolución y más definida la imagen.

Para generar imágenes en la pantalla, el monitor ilumina diferentes pixeles. Cada pixel no es solamente un punto, sino que son tres pequeños puntos fosforescentes que cuando encienden iluminan en rojo verde azul.

El monitor utiliza tres cañones electrónicos, uno para iluminar cada color. Cuando ya está iluminado un punto fosforescente debe ser reactivado periódicamente para que permanezca encendido. Los cañones electrónicos del monitor deben reactivar frecuentemente cada renglón de pixeles de izquierda a derecha como se muestra a continuación:

Cuando los cañones alcanzan la parte inferior de la pantalla regresan a la parte superior de la pantalla. Para eliminar el parpadeo, los monitores EGA y VGA reactivan la pantalla de 60 a 70 veces por segundo.

La computadora despliega una imagen que en realidad reside en una región de memoria de video. Los programas de aplicación colocan la información en la memoria de video, a su vez la tarjeta de video envía esa información al monitor para que se despliegue. Para cambiar la imagen que aparece en la pantalla, los programas simplemente cambian el contenido de la memoria de video.

Cuando observamos la televisión, un nuevo cuadro se exhibe 30 veces por segundo. Exhibiendo 30 cuadros por segundo, la televisión elimina el parpadeo y los movimientos bruscos. Suponga por ejemplo que quiere desplegar video en movimiento (30 cuadros por segundo), utilizando un monitor VGA de 640 x 480 que soporta 256 colores. Cada cuadro de video requiere más de 300 mil bytes. Puesto que deben desplegarse 30 cuadros por segundo la computadora tendría que procesar 9 MB por segundo.

Recordemos que antes de que el monitor pueda desplegar una imagen, los valores de los pixeles, que en su conjunto forman una imagen, deben residir en memoria de la tarjeta de video. Para desplegar video en movimiento, la cantidad de información que debe transferirse a la tarjeta de video sería cercana a los 600 MB por minuto.

Debido a que las características técnicas de un CD-ROM no permiten transferir toda esa información, está es reducida en compactaciones de bytes. Después de que la tarjeta de video reciba esa información se tendría que descompactar. Actualmente las tarjetas de video que realizan está función son muy escasas e irracionalmente costosas.

La mayoría de las computadoras Multimedia puede, sin embargo, desplegar video utilizando una resolución de 320 x 200 a una velocidad de 18 cuadros por segundo. En la mayoría de los casos
estos videos se ven muy bien cuando se despliegan en una ventana pequeña. no obstante, cuando se reproduce el video en una ventana más grande, el video se ve más "espasmódico".

En nuestros días, el video en movimiento es el elemento de Multimedia que puede hacer que una multitud emocionada contenga la respiración en una exposición comercial, o que un

estudiante mantenga vivo el interés en un proyecto de enseñanza por computadora. El video digital, es un buen medio de la Multimedia para aquellos usuarios que están acostumbrados a la televisión. Si se utilizan elementos de video digital, se pueden presentar mensajes en forma efectiva y reforzar el proyecto.

Los estándares y formatos para texto digital, imágenes y sonido están establecidos con claridad y son de uso común, pero el video es el elemento más nuevo que se ha integrado a la Multimedia. Las nuevas tecnologías y novedosos sistemas de software obliga a moverse rápidamente a los científicos de la computación y vendedores de las dinámicas compañías nuevas por el carril de alta velocidad del video, tarjetas de superimposición de video, esquemas de compresión y programas de interfoliado.

De los elementos de Multimedia, el video exige mayores requerimientos de la computadora y memoria. No debemos olvidar que una imagen de pantalla completa en la computadora, puede abarcar hasta 1 MB de memoria, si multiplicamos esto por 30 (que son el número de cuadros que se requieren para 1 segundo y poder dar la sensación de movimiento), necesitará 30 MB por segundo para reproducir video, 1.8 gigabytes por minuto ó 108 gigabytes por hora. Por eso casi todos los avances en la tecnología de Multimedia, centran sus nuevos desarrollos en aceleradores de video y en la compresión de las imágenes digitales de video para llevarlas a dimensiones más manejables. Un sistema sofisticado de Multimedia, puede incluir instrucciones para que el video se almacene en RAM para una reproducción rápida.

HARDWARE

TARJETAS DE CAPTURA DE VIDEO

Es común que las tarjetas de superimposición de video puedan capturar y digitalizar cuadros de video, así como reproducirlos a partir de las fuentes de video analógicas; se utilizan con frecuencia para hacer películas QuickTime y AVI. Muchas tarjetas de sonido también incorporan facilidades para captura de audio y administración de sonido, de modo que la parte de audio de una secuencia de video pueda interfoliarse digitalmente y sincronizarse con las imágenes durante la digitalización. Sin embargo, se debe estar consciente que algunas tarjetas sólo muestrean a 8 bits a 22 KHz, lo cual no es de calidad CD, pero en la actualidad es la más común para Multimedia que se distribuye en un CD-ROM.

Algunas tarjetas de superimposición de video ofrecen compresión por hardware. Hasta en las computadoras más rápidas se pierden algunos cuadros de digitalización porque la computadora está demasiado ocupada administrando la información del video que entra. Algunos sistemas de digitalización utilizan chips especializados para la digitalización de video y esto permite que sea capturada exitosamente una pantalla completa de video en movimiento a tiempo real a 60 cuadros por segundo. Sin embargo, la única desventaja de estos sistemas es que para la reproducción del video digital, se necesitan chips del mismo tipo en la máquina que ejecuta el archivo.

Algunas tarjetas de superimposición de video también proporcionan salida de video para NTSC para que pueda grabar en cinta de video lo que aparece en su monitor.

Como productor o desarrollador de Multimedia necesita convertir su material de video original de su forma analógica común a la forma digital que pueda manejar la computadora del

usuario final. Para manipular la información digital, se emplean programas como el Video para Windows.

DIFERENCIAS ENTRE VIDEO DE TELEVISION Y DE COMPUTADORA

A pesar de que la mayoría de los monitores de computadora tienen la misma relación 4:3 que la pantalla de televisión, aquella sólo proporciona un barrido de 480 líneas de resolución horizontal de arriba a abajo (para el caso de un monitor VGA), no las 525 o 625 líneas del formato NTSC o PAL. Además, el monitor de una computadora barre cada línea progresivamente, sin entrelazado; el barrido se hace para todo un cuadro a una velocidad típica de 66.67 Hz o mayor, que difiere de los 60 Hz de un cuadro completo de televisión.

La reproducción y despliegue de color se realiza en forma diferente en el televisor que en el monitor de la computadora. Puesto que estas utilizan el video con componentes RGB (que separan los colores rojo, verde y azul), sus colores son más puros y exactos que los de la televisión. Por consiguiente, los colores que se utilizan en una imagen generada en video en computadora, serán distintos al desplegarse en una imagen transformada en video de televisión NTSC.

Cuando se produce un proyecto Multimedia, debe considerarse si se reproduce en un monitor RGB o en una televisión convencional. En general, se debe especificar el tipo, las características, y los estándares para el cual debe funcionar adecuadamente la resolución. Para incluir video de pantalla completa a una velocidad de tiempo real en un proyecto de Multimedia, se necesita invertir en equipo y programas especializados.

COMPRESIÓN DE VIDEO

La digitalización y el almacenamiento en su computadora de una secuencia de díez segundos de video con movimiento a tiempo real requiere de la transferencia de una cantidad enorme de datos en un período corto. La tecnología actual no permite que los datos sean transportados a tan grandes velocidades. Por ejemplo un disco duro típico transfiere datos a solo 1 MB por segundo, y un reproductor CD-ROM a la ridícula velocidad de 150 K por segundo. Este cuello de botella tecnológico se está superando en la actualidad con las técnicas de compresión de imágenes. Los algoritmos de compresión de imágenes de video a tiempo real, como el JPEG, MPEG, P*64, DVI y C-Cube, se encuentran disponibles para comprimir información digital en relaciones que van de 50:1 a 200:1. Los esquemas de compresión mencionados utilizan la transformada discreta del coseno, un algorítmo que cuantífica la habilidad del ojo humano para detectar las distorsiones de color e imagen.

JPEG

El JPEG es el más popular de los estándares de compresión que se ha desarrollado para imágenes fijas. Comprime en relación cercana a 20:1 antes de que ocurra alguna degradación visible en la imagen.

Cuando se aplica una relación 30:1 a un cuadro de video a color, los requerimientos de espacio de almacenamiento se reducen de 1000 K a 33 K y la velocidad de transferencia se

reduce a cerca de 1 Mb por segundo, aún dentro de las capacidades de la mayoría de los dispositivos de almacenamiento.

MPEG

Otro estandar muy conocido en los sistemas de video digital, es el MPEG el cual fue desarrollado por Moving Picture Experts Group, se utiliza para codificar imágenes en movimiento. Su esquema permite comprimir audio; sus velocidades de compresión son mayores y la descompresión se hace en tiempo real. El MPEG comprime a relaciones de 50:1 antes de que se degraden las imágenes. El MPEG como el JPEG, utilizan el sistema simétrico, lo que significa que comprime y descomprime a la misma velocidad.

DVI

Este sistema es una tecnología programable de compresión y descompresión propietaria que se basa en el conjunto de chips i750 de intel. DVI brinda dos niveles de compresión: video de producción y video de tiempo real, los algoritmos DVI pueden comprimir imágenes de video con relaciones entre 80:1 y 160:1. El DVI reproduce video en el tamaño original de cuadro y a todo color a velocidades de 30 cuadros por segundo, mientras el JPEG sólo proporciona una imagen aceptable en una ventana pequeña en la pantalla de la computadora. Cuando se incorpora a una macrocomputadora, la reproducción del DVI se apróxima a la calidad de las estaciones de televisión

INTERFACES DE SISTEMAS PARA COMPUTADORAS PEQUEÑAS SCSI

SCSI es la interface de sistemas para computadoras pequeñas (Small Computers System Interface, SCSI). Este sistema permite conectar hasta siete dispositivos periféricos externos como discos duros, unidades de CD-ROM, impresoras, digitalizadores, unidades de cartucho recargables y unidades magneto-ópticas.

Dicha interface permite conectar más dispositivos rápidos y eficientes aún cuando las capacidades de espacio del sistema sean limitadas. Cuando un dispositivo SCSI se conecta a la tarjeta de interface en una PC, se integra al sistema como otra letra de unidad. De está forma se tendría para las unidades de disco A: y B:, para el disco duro C:, para las tarjetas SCSI D:, E:, F:, etc.

El disco duro puede conectarse también a una tarjeta SCSI, y esto beneficiará el rendimiento total del sistema.

INTERFACE DE CONTROL DE MEDIOS (MCI)

Para el ambiente Windows, se diseño el MCI que es un mecanismo de software capaz de manejar y administrar dispositivos periféricos de Multimedia. Utilizando los controladores apropiados (que casi siempre son suministrados por el fabricante) se pueden manejar el dispositivo con cadenas simples o códigos enviados al MCI.

La MCI fue producida para Windows 3.1 pero para los usuarios del sistema 3.0 se puede adquirir este producto por separado. El MDK (kit desarrollador de Multimedia), también incluye la interface de alto nivel del MCI y está versión se utiliza para programadores de Multimedia, es decir, gente que programa Multimedia en lenguajes de alto nivel como Pascal, C, etc.

La siguiente tabla indica los dispositivos soportados por el MCI de WIndows 3.1 :

AVI	AUDIO VIDEO INTERFOLIADO
CDAUDIO	UNIDAD CD-AUDIO
DAT	UNIDAD DE CINTA DIGITAL DE AUDIO
DIGITALVIDEO	VIDEO DIGITAL EN UNA VENTANA
MMMOVIE	UNIDAD DE CINE MULTIMEDIA
OTHER	CUALQUIER DISP. NO IDENTIFICADO MCI
OVERLAY	DISP. DE VIDEO DE SUPERPOSICION
SCANNER	DIGITALIZADOR DE IMAGENES
SEQUENCER	SECUENCIADOR MIDI
VCR	VIDEOCASETERA
VIDEODISC	UNIDAD DE VIDEODISCO
WAVEAUDIO	DISP. DE FORMA DE ONDA.

Los controladores de cd-audio, sequencer, waveaudio se venden con el producto Windows 3.1. El controlador mmmovie para animaciones en Director, y el controlador de videodisco PIONNER LD-V4200, están disponibles en el MDK.

Todos estos dispositivos y controladores son administrados por el archivo de Windows System.INI , en las secciones [MCI] y [DRIVERS] respectivamente. Cada vez que Windows inicia, el System.INI verifica que dispositivos están conectados al sistema. Siempre que instalamos un programa Multimedia y este maneja diferentes DRIVERS, el archivo System.INI se actualiza automáticamente.

SOFTWARE

A) Asimetrix Digital Video Producer
B) Adobe Premier
C) Video Edit
D) Video For Windows

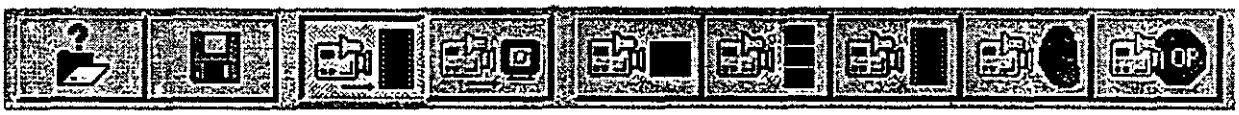
**** Para los incisos C) y D) ver anexo "D"

ASIMETRIX DIGITAL VIDEO PRODUCER

La edición de video con Asimetrix DVP 4.0 es de los más sencillo, la pantalla que presenta el programa es altamente intuitiva, y de fácil manejo.

En este curso vamos a seguir el ejemplo paso-a-paso que se incluye en el programa, en caso de que no aparezca, basta seleccionar en el menú la opción "help", y posteriormente "startup asistant".

Este programa cuenta con un programa especializado de captura de video, al igual que el programa principal, este otro cuenta con una interfaz altamente intuitiva y de uso muy sencillo, que presenta la siguiente barra:

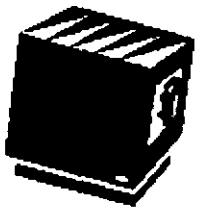


Los primeros dos botones son para salvar archivos, el tercero activa el cuadro azul que aparecerá abajo, y en donde se verá, como en una camara de TV, la imagen que se está enviando a la tarjeta digitalizadora.

Los botones quinto, sexto y séptimo son para grabar, respectivamente un solo cuadro, varios cuadros aislados, o un "clip" o secuencia de video.

Una vez que se tiene un archivo salvado conteniendo el clip deseado, se puede pasar al programa "Video Producer", en el cuál se pude cambiar la pista de audio, hacer algunos efectos con los videos y realizar varias mezclas como veremos al seguir el tutorial paso-a-paso.

Un programa utilizado muy frecuentemente en la edición de video, es el "Adobe Premeiere", que veremos a continuación.



Using Adobe Premiere

Basics

Key Terms: Clip, Movie, Project, Project Window, Construction Window

The purpose of using Adobe Premiere is to create a **Movie** which is a unit of viewable digital video. Every Adobe Premiere movie starts as a **Project**--a collection of **Clips**, the items which may be used in the production of a movie, organized along a timeline. A new Project is created by choosing File | New | Project from the menu bar.

The following windows are used as a Project is turned into an Adobe Premiere movie:

The **Project window** is analogous to the Cast in Director and the Layers window in Photoshop. It contains the Clips to be used in producing the movie. Clips may be movies (such as .avi files), still images (such as .psd and .jpg files), and audio tracks (such as .wav files) to name a few.

The **Construction window** is analogous to the Score in Director. It is the area where one can lay out the clips to be included in the movie and manipulate when each will be played. It is also the place where most editing effects (such as titles, transitions, etc.) are created.

The Construction window consists of several tracks. Adobe Premiere plays all the clips in the Construction window in order from left to right. In order to be included in the project, clips must be copied or dragged from the Project window to the Construction window and placed on a track. The simplest arrangement for a movie is to assemble the clips end to end on a single video track so that the out point of one clip butts against the in point of the next clip. To create a movie with less abrupt transitions between clips, you can place clips on the A and B video tracks so that they overlap and use the T track for transitions. You use the S tracks for movie clips, still-image clips, or titles you want to superimpose.

To Capture Video and Make a Simple Movie

(Note: This assumes the video to be captured is cued in the VCR and ready to be played)

1. Choose File | New | Project. The default dimension setting you will be prompted for, "Presentation - 160x120", is usually your best choice.

2. Choose File | Capture | Movie Capture. A window with a Record button at the top will appear.

3. Press Play on the VCR (if it's not already playing).

4. You should see the video that is playing on the VCR monitor in the Record window. Press the Record button to begin recording. Note: When you hit Play on the VCR, the word "Play" is superimposed on the picture on the monitor for a few seconds. The word "Play" WILL be recorded along with the video while it is displayed. Therefore you may wish to cue the video several seconds earlier from the point where you wish to record before playing.

5. After capturing, save the clip you have just captured by choosing File | Save.

6. Drag the clip onto the Construction window. This will automatically add the clip to the Project window as well.

7. Pull the orange triangular handles on the Work Area Bar, the yellow bar at the top of the Construction window, such that the length of the bar is the same as the length of the clip. What is contained within the bar is what will be saved as a movie.

8. Choose Make | Movie from the menu. The result is a saved video movie that is now playable.

You can preview your projects in the construction window either by choosing Project | Preview or by holding the mouse over the time grid at the top of the Construction window, clicking, and dragging in the direction you wish the movie to play. In this manner, you control how fast and which parts of the movie are previewed.

However: To preserve your sanity and avoid the destruction of expensive machinery, it is critical to note that projects often crash during preview if the clips in the project are not already compiled movies. For example, if you try to drag raw captured clips (that have not been made into movies) to the Construction window and then preview the project, Premiere will crash. And you will get upset. This can be tricky business because saved raw clips and those compiled as movies have the same default extension (.avi) and look identical in the Project window, so it may be difficult to tell the difference between them. So if you want to use the preview tools in the Construction window, you may have to a) drag a captured clip to the Construction window, b) make it into a movie c) import the movie you just made back into the project, and d) replace the raw clip in the construction window with the compiled movie.

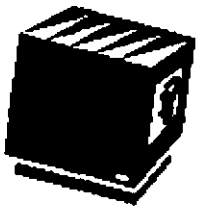
Maneuvering Within the Construction Window:

The **time ruler** at the top of the Construction window reflects the selected time unit. It displays the current position of the pointer and any place markers that have been set in the Construction window. From the time ruler, you can also determine the starting and ending positions of each clip and the duration of the entire movie. The large tick marks on the time ruler represent the current time unit; the small tick marks represent frames or seconds, depending on the current time unit. As you move the cursor in the window, a hairline marker moves in the time ruler to indicate the current cursor position. You can scroll in the Construction window to move to a location on the time ruler.

The **razor tool** in the Construction window cuts a clip into two or more distinct clips. To split a clip into two clips:

Select the razor tool in the Construction window, and click anywhere on the clip. The clip splits into two separate clips, and a new clip is added to the Project window. Each clip reflects its individual duration, with new settings for the in point or out point. To split the clips on all unlocked tracks, Alt+click the razor tool. For more precision when splitting a clip, you can change the time unit in the Construction window to display more frames, or you can use the zoom tool to zoom in on the area.

Note: Double-click the razor tool (or press Shift+R) to use the tool for



Trimming

Basics
Trimming
Motion
Titles
Superimpose
Transitions
Filters
Speed
Screen View

In the Construction Window

You can trim clips in the Construction window several ways. You can use the in and out point tools or the ripple edit and rolling edit tools, or you can simply drag the edges of the clip. For better trimming precision, choose a low time unit in the Construction window. You can also use edge viewing to view the frames in the Preview window as you drag the edges of the clip. When you change the duration of a clip in the Construction window, the Info, Project, and Clip windows are automatically updated with the new clip duration. To trim a clip using the in point and out point tools:

1. Select the in point or out point tool in the Construction window by clicking the tool icon or pressing I or O on the keyboard.

Note: If you click the in or out point tool once, the tool reverts to the selection tool after one use. Double-click the in or out point tool to use it repeatedly.

2. Click the in point tool on the left edge of the first frame you want displayed in the movie.

3. Click the out point tool on the right edge of the last frame you want displayed in the movie.

To trim a clip by dragging:

1. Position the selection tool on the edge of the clip to be shortened or lengthened. The selection tool turns into a stretch pointer.

2. Drag to shorten or lengthen the clip, and release the mouse button when the clip reaches the desired length.

In the Trimming Window

If you want to be as precise as possible when trimming clips, use the Trimming window. The Trimming window lets you add or subtract frames from clips at edit points along the timeline. While making adjustments, you can see the exact frame that appears on each side of the edit point. When trimming a clip this way, the durations of all other clips on the track remain the same. This is an example of a ripple edit.

To perform a ripple edit in the Trimming window:

1. Choose Trimming from the Windows menu. The Trimming window appears.

2 . Click the Next or Previous button to move the edit line to the point you want to adjust. The frames on both sides of the edit point are displayed in the Trimming window. If you position the edit line on a transition, the last frame of the clip on track A and the first frame of the clip on track B are displayed.

3 . To add or subtract a specific number of frames from the clip on the left side of the edit point, click either the + or - button on the left side of the window. To add or subtract frames from the clip on the right side of the edit point, click either the + or - button on the right side of the window.

4 . To add or subtract a larger number of frames, drag the Jog control on either side of the window. The edit line moves in the direction and distance you drag. Alternately, you can add or subtract frames by clicking one of the time displays and typing a new time value.

5 . To preview the new edit, click the Play button.

In the Project Window

A clip opens in the Clip window at the frame corresponding to the current in point. The duration counter shows the duration of the clip from the current in point to the current out point.

Note: You can use the Clip window to set in and out points for a clip before importing it into a project. This is useful for importing various sections of a single clip as separate clips. For information on importing

clips, see Importing and Opening Clips.

To change the in and out points in the Clip window:

1. Find the place where you want to set the in point for the clip using one of the methods described in the Viewing and Playing Clips In the Clip Window.

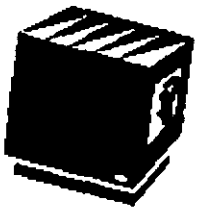
2 . Click the In button or press Shift+I to set the in point.

For movie clips, the in point indicator appears in the upper left corner of the Clip window. For audio clips, the in point indicator appears at the corresponding point along the waveform.

3. Find the place where you want to set the out point for the clip, and click the Out button or press Shift+O.

For movie clips, Adobe Premiere places the out point indicator in the upper right corner of the window. For audio clips, the out point indicator is placed at the corresponding point along the waveform. The duration counter at the bottom of the window shows the new duration of the clip.

Note: Changing the in and out points of a movie clip that is linked to an audio clip will affect both the movie and audio portions of the linked clip.



Motion

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Premiere allows you to define a path along which a clip can move in the movie frame. You can define a motion path for any movie or still image clip.

How to put a clip in motion

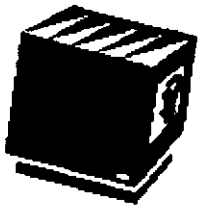
1. Select a clip in the construction window.
2. Choose motion from the clip menu.
3. Set points on the motion path by:
    - Moving the Start and Finish points.
    - Positioning the pointer anywhere on the motion path. The pointer turns into a pointing finger. Click to add a point to the path, and drag to adjust its position on the path. When you release the mouse, the point is selected and you can add options to the selected point.
    - Clicking above the timeline

Changing the Speed of Motion

Points that have been added to the motion path are represented on the timeline below the path. The length of the timeline represents the duration of the clip. The relative speed of motion between path points is determined by the distance between points along the timeline. Adjust the speed by dragging points closer together or farther apart along the timeline.

Motion Options

You can specify the movement options along a clip's motion path. An image can be rotated, distorted, and zoomed in or out along the path.



Titles

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Title clips are created in the Title window. Title clips can contain text, lines and geometric shapes. Titles can be opaque or transparent. A title clip has a file extension of .ptl.

How to create a title

1. Go to the File menu, choose New then choose Title. This opens the Title window and the Title menu.
2. Use the tool from the toolbox to create the type and graphics you want in the title.
3. Go to the File menu and choose Save.
4. Hold down the CTRL key and drag the clip from the Title window directly into the Construction window. You can also import title clips into the Project window by going to the File menu and choosing Import.

Title Window Toolbox Options

Selection Tool- selects an object or block of text. Hold down shift key in order to select multiple items.

Eyedopper Tool-can be used to assign color, transparency and gradient fill attributes to the object color swatch. Option click an object or shadow to assign its attributes to the shadow color swatch.

T Type Tool-creates and edits text.

Line Tool-draws straight line segments.

Rectangle Tool-draws rectangular shapes. Clicking on the left side of rectangle icon draws framed rectangles, clicking on the right side of rectangle icon draws filled rectangles.

Polygon Tool-draws polygons. Clicking on the left side of polygon creates framed polygons, clicking on the right side creates filled polygons. Draw the polygon one side at a time, clicking to define the end points of each line segment. Double click when you are done to complete the polygon.

Rounded Rectangle Tool-draws rectangles with rounded corners. Click the left side of the icon to draw a framed rounded rectangle, click the right side of the icon to draw a filled rounded rectangle.

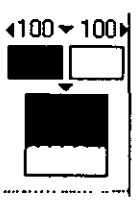
Oval Tool-draws oval shapes. Click the left side of the icon to draw a framed oval, click the right side of the icon to draw a filled oval.

☐ Draft Draft Check Box-select this box if you want work without previewing the color and opacity gradients. This speeds up the redraw time of type and objects in the Title Window. Does NOT affect the quality of the actual title clip.

1 Line Weight Slider-allows you to adjust the line weight of a framed object.


Color Swatches:

- object color swatch (upper left square) shows the color of the currently selected object.
- shadow color swatch (lower right square) shows the color of the selected object's shadow



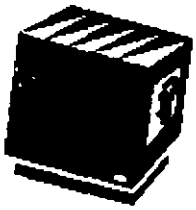
Gradient Controls-allows you to create color and opacity gradients across objects and shadows.

Using the Clip Frame for Title Positioning

1. Set marker 0 to the frame of the clip you want to display the title

you are going to create.

2. Drag the clip from the Clip or Project window into the Title window. The marked frame is displayed in the Title window.
3. Remove the frame from the Title window by choosing Remove Background Clip from the Title menu.



Superimpositions

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Superimposing clips involves placing one clip over another. The top clip, or the superimposed clip, is made transparent to allow the bottom clip, or the background clip, to show through. The superimposed clip goes on the S track while the background clip goes on either the A or B track.

Superimpose options

- None- no part of the superimposed clip is transparent.
- Chroma-allows you to select a color or range of colors in the clip to be transparent.
- RGB Difference-like Chroma, it allows you to select a range of colors in the clip that will be transparent. But the Chroma key allows you to adjust the colors and the gray values of the superimposed pixels separately.
- Luminance-allows you to remove gray values while retaining the color values.
- Alpha Channel-an alpha channel is an invisible gray scale channel assigned to an image. This technique allows you to superimpose an image by removing the black areas of an image's alpha channel and making the white areas of the alpha channel opaque.
- Black Alpha Matte-allows you to superimpose an image that contains an alpha channel but has been created on a black background.
- White Alpha Matte-allows you to superimpose an image that has no alpha channel and was created on a white background.
- Image Matte-allows you to play a movie through a still image placed on top of the clip on the S track.

- Difference Matte-keys out the identical areas of two clips and retains the difference.

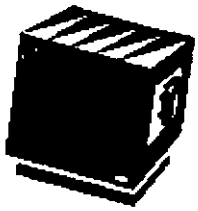
- Blue Screen and Green Screen-used with images with true chroma green and true chroma blue backgrounds.

- Multiply-keys out the areas of the superimposed image that are lighter than the underlying image.

- Screen- lightens the areas of the underlying image that are lighter than the superimposed image.

- Track Matte-uses the clip on the S track of the Construction window as a matte. A track matte can be created from a moving or still image.

- Not Red-for use with images that have green or blue backgrounds. Similar to Blue or Green Screen but Not Red allows you to create semitransparent objects and helps reduce fringing around the edges of nontransparent objects.



Transitions

HOW TO USE TRANSITIONS:

Transitions simply link one visual idea to the next. Sometimes these links can be smooth and subtle: fade from a setting sun to the bright face of a buttercup, white clouds that very slowly reveal within them the features of a woman (*Sophie's Choice*). Sometimes these links can be abrupt: a dancing figure that "becomes" a charging rhinoceros (*Jacob's Ladder*), "blur ins" from reality to fantasy as in the series *Dream On*. As the editor it is up to you to decide what you want each transition to say about your material. The only way to get to where you want to eventually go with transitions is practice, trial and error. Not always smooth going, but hopefully fun just the same. This is intended as a guide to getting started. How far you go is ultimately up to you. As with Photoshop, experimentation and talking to others is the best way to learn, but do not discount the manual just because it seems technical. It is very useful for explaining some of the quirks of the program that might be the unknown cause of problems you may be having.

1. Place within the **Construction Window** either two clips you wish to join with a transition, or one clip that you then razor apart. Going from left to right, the first clip should be in the **A** row and the second should be in the **B** row with the first frame of the **B** row clip immediately below the last frame of the **A** row clip.

2. Select **Windows > Transitions** and the **Transitions** dialog box will open.

3. Scroll through the 70 different options. Choose one that interests you and place the cursor over the **A/B** cube. Click and drag the block to the **T** row of the **Construction Window** carefully placing it directly under the last frame of the **A** row and directly above the first frame of the **B** row. Your transition is now ready to manipulate.

4. Double click on the transition cube. Its dialog box will open. You can manipulate the settings in this box *and* you can view what the transition will look like by clicking the **Show Actual Sources** box and sliding the

sliders located beneath the boxes. Play with the other toggles in this box. You will notice that you can change the **Track** selector (whether the video runs from track A to B or vice-versa), the **Forward/Reverse** selector and the **Anti-aliasing** selector (see a brief discussion of this in Filters).

5. If you decide you don't like this transition simply highlight and cut it. Look for another transition.

POSSIBLE TRANSITIONS AND THEIR EFFECTS:

Center Split: Image A splits into four parts and slides to the corners to reveal image B. This lends either a graceful glide from one scene to a similar scene or it gives the sense of the subsequent scene being the "result" of the previous scene.

Channel Map: Selected channels from images A and B are mapped to the output. What this means is that you can select elements, colors, lines to emphasize from both A and B and have them appear joined during the transitions.

CheckerBoard: Two sets of alternating boxes wipe to reveal image B under image A. This is a cute effect and has an upbeat feel to it. Good for hard-to-manage transitions that don't have many visual connections, ie. in terms of line, colors, shape, etc.

Cross Dissolve: Image A fades into image B--very elegant. Lends itself to filters and other kinds of additional cinematographic tinkering.

Cross Zoom: Image A zooms in, image B zooms out--very dramatic. Could be hilarious if used with noses, stunning if used with action scenes.

Dither Dissolve: Image A fades into image B--subtle and easy on the eyes. This effect really lets you play with light/dark as well as color effects.

Image Mask: You, the editor, select an image and use it to mask image B onto image A--high degree of control allowed and calls for creativity plus patience to achieve the results you want.

Iris Star: A star-shaped iris opens to reveal image A under image B.

Definately a statement on the editor's part, best used on people or animals not things.

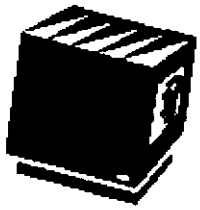
Motion: Image B moves over image A on a user-defined path--control and potential for fun with regards to the image used to move along that path.

Page Peel vs. **Page Turn:** Essentially these are the same thing, except page peel, by emphasizing the underside of the top layer, accentuates the effect of pages one atop the other.

Slash Slide: Image A slides over image B in many independent sections--a cool way to reveal the next segment provided the colors in each clip are compatible.

Stretch In: Image A fades as image B is stretched into view--allows transitions from clips to clips that are not good meshes, especially if obscuring filters are applied to the ends of clip A.

Texturize: Image A is mapped onto image B--this is another filter that allows a great deal of user control. With filters in place this transition can create a very artistic sort of effect.



Filters

Applying filters to your video gives you, the creator of the audience's viewing experience, a measure of subtle control that is equivalent to the difference between watching a movie with or without its musical score. A guy sitting in a chair with his hair flying behind him to the tune of Wagner's De Valkyrie is very different to a guy sitting silently in a chair having a bad hair day. Use filters to correct, enhance, mute the raw video you have. Filters are your opportunity to guide the audience's viewing and to lead them to an understanding of your point of view without them even knowing that you, the editor, were ever there.

HOW TO USE FILTERS:

This is intended as a guide to getting started. How far you go is ultimately up to you. As with Photoshop, experimentation and talking to others is the best way to learn, but do not discount the manual just because it seems technical. It is very useful for explaining some of the quirks of the program that might be the unknown cause of problems you may be having.

1. Have the clip in the **Construction Window**.

2. Click on the segment to which you want to apply a filter. Remember: if you don't want to apply a filter to the entire clip (recommended) then use the razor to cut the clip (the video will still play through these parts smoothly unless you move them).

3. Go to **Clip > Filters**: The **Filters** dialog box appears: choose the filter/effect you want from the lefthand, **"Available"** box, click on the **Add** button to apply it. It will move to the **"Current"** box which means it is now applied to your clip.

4. Some filters will automatically give you a **Settings** dialog box in which you can further adjust what the filter does and preview what will happen to your image. (To correct mistakes continue reading.)

5. Click **OK**. You will now see a green bar over the clip you worked on. This indicates that a filter or filters are present. If you are not happy with the effect you may simply go back to **Clip > Filters** and remove the effect you don't want by highlighting it in the righthand **"Current"** box and clicking on **Remove**.

POSSIBLE EFFECTS AND REASONS FOR APPLYING FILTERS

Anti-alias: creates a compromise between the stronger hues in the image and essentially blends them down to something much less distinct. The difference between this and the Blur filter is akin to the effect of rain on a pastel drawing versus pulling a lens out of focus. Anti-alias might be a good start to a fade out, or as a way to mute nudity.

Bend: stretches your center image horizonatally and vertically while creating a wavering border on the outer edges of the frame. You will be allowed to select the intensity and shape of the waver. This effect is similar to the image reflected from a mirror ball on a windy day.

Black & White: enhances the lines and luminance of your image. An elegant way to accentuate the simple beauty of an image or add drama to a human face. It is less effective for crowd scenes.

Brightness & Contrast: lends you control over how much light is allowed into your video, and how intense the difference between light and dark can be. This is an essential part of video editing and the wise editor becomes familiar with this filter FIRST. Note that a very little goes a long way here and be cautious in applying it universally, being sure that each scene is evaluated as a separate entity and then being sure that it can mesh with the scene that follows.

Color balance: yields less control over color than in Photoshop but is useful in gently highlighting existing colors or applying a cast over the image. Use caution with this filter as it may make transitions difficult to mesh later on. Once the change to a clip is made the controls go back to the neutral setting so even if you've changed your boss' coloring to that of the Incredible Hulk and you want to change it back to normal the controls will not show you how far along the scale you went in changing the color, leaving you to decide what is normal for the image, or in this case,

how green your boss *really* is!

Crystalize, Spherize, Swirl, Tiles, etc.: break your image apart or down and can be a great deal of fun. Also, these changes are so radical that you can easily discern where you are and how to get back from there should you wish to bring the image back to its original state. Useful for adding emphasis to your video in the same why that a welcoming dog adds emphasis to the return of its owner. People really enjoy this stuff when judiciously applied.

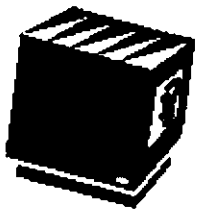
Ghosting: overlays previous frames of a clip with other transparent frames. Effects similar to time lapse photography or the blur of someone suddenly moving in front of a camera on a slow speed setting. A good way to initialize transformation-style transitions.

Image Pan: allows you to take a clip and zoom or pan across the image. You can also use this to create rolling credits and similar effects. This is one of the more challenging filters and you must allow yourself plenty of time to become accustomed to the various controls and requirements involving borders, screen size/view, etc. Sometimes it is often better to shoot the effect you want than to try to create it in this way.

Video Noise: What!? *Add* noise to a clip you shot yourself when all Hollywood ever does is purify images to a point that it no longer looks like the same world we live in? Well, this effect allows you to blend a clear, still photograph with the noisy (meaning not perfectly sharp) video you are editing. You might wish to use **Video Noise** with something like this: Open-- scene of your grandmother at her birthday party, she blows out the candles, sits back and smiles and then the photograph of her on her prom night is blended in, add video noise, blend, remove video noise, still shot clear and bright-- close scene. Well okay, so I grew up on Hallmark movies, but you get the idea!

Wind: destroys the image slowly by blowing its pixels away as if in a large windstorm. Your image has to lend itself to this. An image under black and white filter with wind applied can be really dramatic.

Remember, there are many more filters, explore them soon!



Speed

Controlling the speed of your video is essential to maintaining your audience's interest as well as to get your point across about your subject. Imagine the closing minutes of *Princess Bride* where she jumps out of the castle window into the waiting giant's arms. If she had fallen like a human body actually does she would have been a frightening blur, his catching her would have been entirely unconvincing and the audience would instantly have dropped their happily suspended disbelief. Instead, clips are shot of the apex of her bouncing on a trampoline and then the speed of her falls are slowed drastically to make it look like she is as gossamer light as the gown she wears. Result: we believe that a woman can jump from a high window and virtually float into the arms of a waiting person below without sustaining and inflicted serious injury. Or what about those long shots of children riding their bicycles into bushes as seen on "America's Funniest Home Videos?" So much funnier when faster (we won't go into the psychology of this here).

HOW TO WORK WITH SPEED:

Work is right, especially where motion is concerned! Remember: this is intended as a guide to getting started. How far you go is ultimately up to you. As with Photoshop, experimentation and talking to others is the best way to learn, but do not discount the manual just because it seems technical. It is very useful for explaining some of the quirks of the program that might be the unknown cause of problems you may be having. In the case of Speed settings, the manual and practice may be all the help you will be able to find.

The default setting for movie and audio clips is 100 percent. You can change the speed from -10,000 to 10,000. Obviously, the minus numbers will so slow your clip that it plays backwards, and the higher the number the faster the clip. It is good to know that changing the play speed will basically reduce or multiply the number of frames that comprise your clip, similar to what happens when you enlarge or reduce an image in Photoshop.

1. Go to either the **Project Window** or the **Construction Window**--wherever is easier to work with at the time.

2. Go to the **Clip** menu, choose **Speed**.

3. Choose a rate between -10,000 and 10,000.

4. Click **OK**.

5. You can do this with as many clips as you like. They will each appear with their different times in the **Project Window**.

POSSIBLE SPEED APPLICATIONS:

Freeze Frame: You will have to set the clip's speed to O and you would do this when you trim the clip you wish to freeze. It might be good to use a transition of some kind to "restart" your frozen video.

Blending frames: Sometimes in the process of capturing your video the capture rate will be slower than the video. This causes a jittery effect. To correct this you might wish to blend frames.

1. Select the clip in the **Construction Window**.

2. From the Clip menu choose **Frame Hold**.

3. In the **Frame Hold** dialog box make your adjustments to rate by typing in a rate in the text box.

4. Select **Frame Blending**.

5. Click on **OK**.

Separating/Rejoining: To get the very professional effect of separating your video and audio consider manipulating the links between them in Premiere:

When you capture a video, you capture both its audio and video. At this point the video and audio are *hard linked*. You can manipulate the audio

but once you do, the hard link will forever be broken. This won't matter since you can establish a *soft link*. Just remember, once you break the hard link you cannot count on the audio and video to play perfectly as recorded without you controlling them. Note that audio clips follow their video counterparts during cutting and pasting and the hard link is unaffected.

To Break a Hard or a Soft Link:

In the **Construction Window** select your clip and go to the **Edit** menu and choose **Break Link**. Manipulate the clips as you would video clips, using the alignment markers to guide you.

To Create a Soft Link:

First realize that you cannot do this to a hard link without first breaking the hard link. Then, in the **Construction Window** select the audio or video clip you want to work with, click the soft link tool from the lower lefthand corner -- it looks like one page overlapping another but with no dotted line around it. With the soft link tool active lick the clip you wish to link.

Advanced Editing Techniques

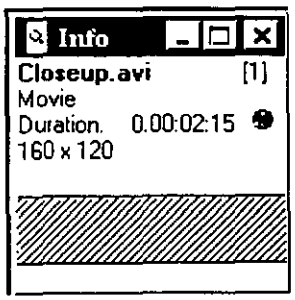
Using Adobe Premiere

By Philip Ruthstrom

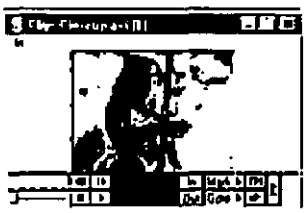
These pages are designed to serve as a review of the class session of April 14, 1998.

Topics covered in this lecture review are:

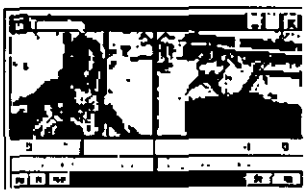
The Info window displays information about a selected clip, transition or space.



The Clip Window displays the chosen clip.



The Trimming Window displays both clips on either side of a chosen edit point.



IN and OUT points allow you to set insertion points of both a source clip and a destination in the project.

MARKERS allow for precise syncronization of all combinations of video and audio clips.

CLIP TRIMMING sets the size or the selected clip in the project.

PROJECT TRIMMING sets the finished project size and removes unnecessary frames and clips from the project.

Return

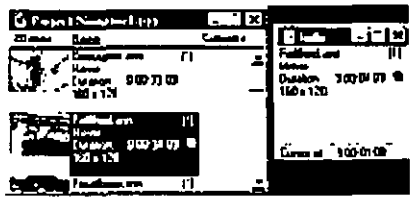
The Info Window

The Info window displays information about a selected clip, transition or space. The information varies according to where you make your selection:

If you select a clip in the Construction Window, the Info Window displays the name of the clip, the type of clip, the speed of the clip, the duration of the clip, the size of the clip, the fade control settings of selected points,

the starting and ending times and the current location of the pointer.

If you seclect a clip in the Project Window, the Info window displays the clip's name, type, duration, size, starting and ending points and the current location of the pointer.



If you select a transition in the Construction window, the Info window displays the transition's name, duration, starting and ending points, and the current location of the pointer.

If a Title window is active, the Info window displays information about a selected object, including its size and position in the window.

If you select an empty space, the Info window displays the space's duration and starting and ending times.

To display the Info window, choose Info from the Windows Menu or press Ctrl+8.

Using the info window allows you to position clips precisely by dragging with the cursor or by using the arrow keys to move the selection one frame at a time. You can also use this window to precisely position a selected object a a desired location or time.

Return

The Clip Window

The Clip window is the most used of the assembly windows. This window is where the clip is viewed, marked and edited. It can be opened from the Windows Menu, or double clicking on the clip thumbnails in the Construction, Trimming, or Project windows.

Here you may view the clip in various ways. Play the clip by clicking the Play button. Scrub through the clip using the slider bar. Move frame by frame by clicking the frame advance buttons, set In and Out points and Markers, and jump to specified locations using the control functions.

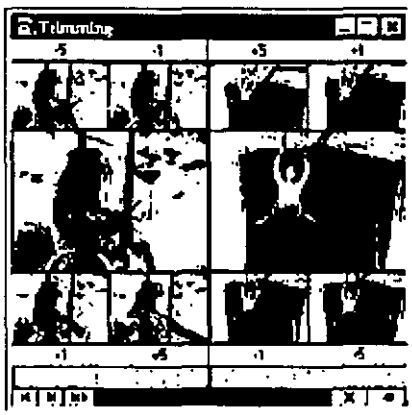
Return

The Trimming Window

The Trimming window allows for the most precise editting in Adobe Premiere. Video clips can be edited with ease down to a single frame and audio clips down to 1/600 second.

The uniqueness of this window is that it is actually two windows in one. The window displays both clips on either side of a selected edit point.

You can also elect to display additional frames up to five before and after the edit point. In this Screen shot you will see both clips set this way.



In this window you are viewing both clips. The larger view in the middle of each window shows the clip at the edit point. The others show the frames immediately before and after the edit point, and the fifth frame before and after as well. You change the settings by either selecting the Windows Menu and choosing Trimming Window Options, or right clicking on the Trimming Window and selecting Window Options in the Pop-Up Window. If you encounter a Page Peel icon in any window, it represents the first or last frame of the source clip.

Here the icon is in the upper left corner of the right clip. This indicates that the frame at the edit point is the first frame of the source clip. You will notice that the window does not display any frames before the selected frame. (the blank frames above) The window does show the additional frames to the other side of the edit point.

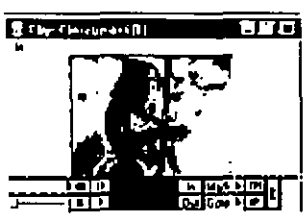
Return

Setting IN and OUT Points

In traditional editing, the metaphor goes back to manual film editing. Originally after the individual scenes were shot and developed, the editor would cut the filmstrips at selected points. Any portion of the film that would not be used in the final product would literally "hit the cutting room floor." The editor's job was to decide where to make the cut; cut the film, and tape the segments back together in the desired order. When video came along, the process was virtually the same. The analogue tape was actually cut at the desired location and spliced back together. Later, when the technology came available, video editors would play one tape begining at a specified point and ending at a specified point. This signal was re-recorded on another tape. This alllowed the tape to be edited without actually cutting and splicing the source tape.

Adobe Premiere uses the cuttting and splicing metaphor, but preserves the original sources. In reality, Premiere does not alter the sources at all. It only assigns electronic tags to use during final assembly. The final assembly process is MakeMovie. It is at this command that Premiere searches the database an retrieves the desired selections and composites them as a finished project. There are two types of IN and OUT points to consider. IN and Out of the source and IN and Out of the target (construction).

The In and Out points of the source clip are assigned in the Clip window. To set the IN or Out point for the clip, align the clip at the desired frame then select either IN or OUT as appropriate.

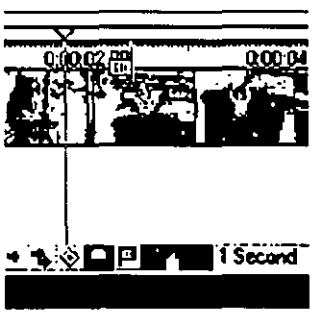


Premiere will display an IN or OUT button to identify the point. This screen

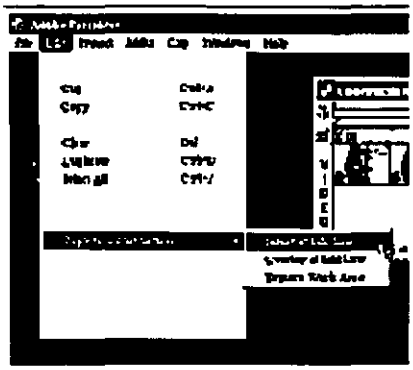
shot shows the IN point with the button in the upper left corner. After the IN and OUT points are selected, the clip will insert at the desired points. The footage before and after the IN or OUT points is not removed. Premiere uses these tags to compile the final product. the complete footage remains in the project until it is removed. Later, we will include the techniques for removing excess footage from the final project.

Setting the IN and OUT points in the target can be done in multiple ways. First, you can establish IN and OUT points in the Construction window by selecting the appropriate flag from the tool bar at the bottom of the Construction window.

After you select the desired flag, align it with the desired point in the Construction window using the Timeline indicator at the top of the window.



Here an IN flag is selected. You may also select the clip in the Clip window or the Project window. After selection, got to Edit >Copy to Construction > Insert at Edit Line from the menu bar. This will Ripple Edit all clips to the right of the Edit line. The other two choices are Overlay which replacesthe existing clips whit the new clip for the duration of hte new clip. And Replace Work Area which replaces the area under the Work Area Bar (yellow bar at top of window).

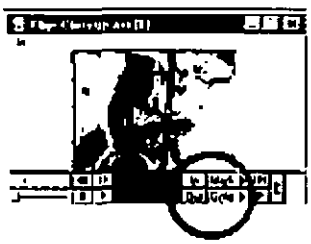


Return

Setting and Using Markers

Markers are tags that Premiere uses to identify locations in the clips. You may us up to 1000 markers but only 10 (0-9) may be named. You assign a marker just as you assign IN and OUT points. In reality IN and OUT points are just special markers. After you set the clip to the desired location, simply select the marker number you wish to use from the box in the clip window.

After you have assigned a number to a marker, the GOTO function allows you to jump to that location. Simply select GOTO and the marker you wish.



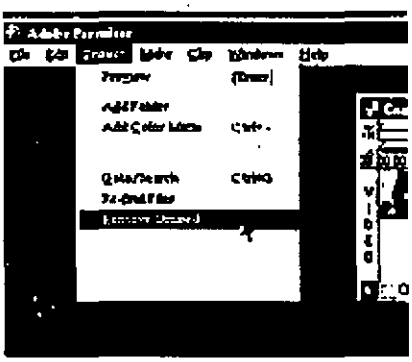
Markers are very useful when aligning points or synchronizing tracks. Markers can be snapp aligned by selecting one and snap it to another marker using the Snap To Edges function in the construction window. Also You may need to use a marker to re-establish a link that has been broken.

Occasionally, linked tracks are puposely separated for editing. Premiere automatically assigns an unnumbered marker at the midpoint of every track whose link has been broken. To re-establish this link, simply snap the appropriate markers together.

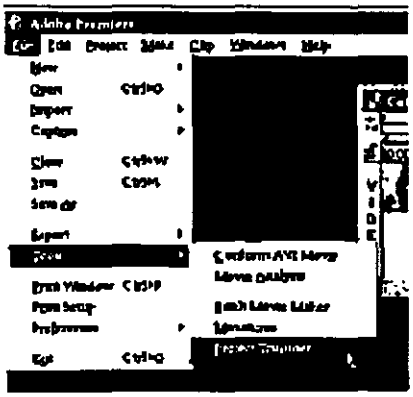
Return

Project Trimming

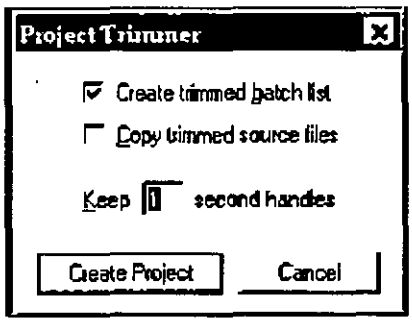
Project trimming involves two steps. First, you should remove all unused clips. To do this, select either the Project window or the Construction window. Then from the Menu bar select Project > Remove Unused. This will remove all clips not actually in the construction from the Project and Project window.



Second, you should remove all footage from the clips that is before the IN points and after the OUT points. This requires a little additional thought. After the project is trimmed, this function cannot be undone. From the Menu bar, select Tools > Project Trimmer.



This will pull up another dialogue box in which you decide on th amount of extra footage to keep. These extra frames before the IN points and after the OUT points are called handles.



They will allow you to make small adjustments after the project is finished. in this screen shot, the default of 1 frame (handle) is shown. This is the minimum. Remember, the more you decide to keep, the larger the file size will be.

Return

Anexo A)

Breve descripción del personal que colabora en un proyecto multimedia

GERENTE DE PROYECTO

Un gerente de proyecto está en el centro de la acción. Es el responsable del desarrollo total y de la implementación de un proyecto, y además, de las operaciones de cada día. Maneja los presupuestos, horarios, sesiones creativas, programación de tareas, enfermedades, facturas, dinámicas de equipo, etc.

El gerente de proyecto tiene dos áreas de responsabilidad, el diseño y la administración. El diseño consiste en proponer la concepción del producto y evaluar toda su funcionalidad con el equipo de diseño, y entonces definir las especificaciones de funcionalidad y adaptarlas según se requiera a través del desarrollo del producto. La parte administrativa consiste en programar y asignar tareas, dirigir reuniones, administrar la consecución de metas, esencialmente supervisar todos los aspectos de la producción, desde el inicio hasta su conclusión.

DISEÑADOR DE MULTIMEDIA

Un buen proyecto de Multimedia debe tener una apariencia y forma de manejo que sea agradable, y que mantengan el interés del usuario. Las pantallas presentan una mezcla atractiva de colores, figuras y tipos de letra. El proyecto mantiene su congruencia visual utilizando solo los elementos que refuerzan el mensaje global del programa. Las indicaciones para la navegación son claras y congruentes, los iconos son explícitos y los elementos de las pantallas son simples y directos. Para poder integrar estos elementos, diseñadores gráficos, ilustradores, animadores, y los que manejan imágenes digitales, se encargan de estructurar la "cara" de la presentación Multimedia.

Los diseñadores de interfaces integran las rutas de navegación y el mapa de contenido en cada proyecto. Los diseñadores de información, dan estructura al contenido, determinan las rutas del usuario y su retroalimentación, y seleccionan los medios de presentación y la manera en la que estos deben ser presentados.

El diseñador de Multimedia prepara la descripción escrita del proyecto global: su contenido, medios e interacción.

> Un proyecto Multimedia necesita ser realmente interactivo, esto es, que se debe saber que esta haciendo el usuario cuando se ejecuta el sistema y como se alterara este en función de cada variable que recibe. Un tutorial inteligente es un sistema adaptable que permite entradas y se modifica en función de estos nuevos parámetros.

Un diseñador de Multimedia necesita ser experto en diferentes tipos de medios, y ser capaz de crear una visión global del proyecto. Debe entender las capacidades de sus recursos, humanos y tecnológicos.

DISEÑADOR DE INTERFACE

> Una interface permite que el usuario tenga el control de la presentación. Una interface no debe distraer al usuario solo es el medio por el cual el usuario navega con el sistema. Proporciona el acceso a los medios Multimedia, como son : texto, gráficos, animación, audio y vídeo.

Algunas de las funciones y tareas que realiza el diseñador de interface son: encontrar los mecanismos con los cuales el usuario se puede mover dentro de un proyecto, el uso efectivo de ventanas, fondos, iconos y paneles de control. El trabajo de un diseñador de interface por lo tanto es el diseño de información, diseño interactivo, y diseño de medios. Una habilidad capital es estar familiarizado con muchas interfaces de Multimedia para ser capaz de visualizar las ideas mientras se exponen. También es conveniente que el diseñador de interface cuente con habilidades básicas de dibujo, porque así podría describir con papel y lápiz cómo se vería una pantalla.

ESCRITOR

Los escritores de Multimedia crean personajes, acciones, y puntos de vista, además de crear interactividad entre escenas. Escriben propuestas, narraciones explicativas, diálogos de actores, pantallas de texto para dar mensajes y desarrollan los personajes de un ambiente interactivo.

Los escritores de pantallas de texto se conocen como escritores de contenido porque buscan y seleccionan información para sintetizarla y presentarla clara y concisa, los guionistas escriben diálogos, narraciones y explicaciones.

En una película o vídeo se desarrolla una historia como lo haría un novelista o un dramaturgo. En Multimedia podría ser más difícil, aún piensas más dramáticamente, pero en pequeño, en unidades más discretas que tienen que interrelacionarse en un esquema general.

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En un proyecto de Multimedia un especialista de esta área debe ser un profesional experimentado con habilidades administrativas en todas las fases de la producción, desde la concepción hasta la edición final. La producción de vídeo en equipo es muy cara pero actualmente es muy necesaria para la producción de proyectos de buena calidad. Los especialistas en vídeo deben de estar familiarizados con las herramientas de edición digital.

Un especialista en vídeo debe entender el potencial y las limitaciones de los medios, cómo estás afectan la producción del vídeo en sí mismas. Deben entender la interactividad y cómo afectará el vídeo. Para algunos proyectos que requieran más trabajo, un especialista en vídeo debe ser el responsable de un equipo completo de graficadores de vídeo, técnicos de sonido, diseñadores de iluminación, diseñadores de escenografía, supervisores de guión, cargadores, asistentes de producción, cargadores y actores.

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es el espacio de almacenamiento disponible en disco y hacer los cálculos necesarios para optimizar la velocidad de muestreo a la cual son digitalizados los sonidos. Un especialista en audio necesita ser más creativo y talentoso que un ingeniero o un artista tradicional de sonido. Emplear técnicas robustas para el diseño y producción de audio interativo.

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Un programador de Multimedia o ingeniero de software, integra todos los elementos de un proyecto en un conjunto congruente, utilizando algún secuenciador o manejador de objetos. Es responsabilidad del programador la codificación de pantallas sencillas de elementos de Multimedia, hasta el control de equipos periféricos, como unidades de disco láser y manejo de programación compleja, transiciones y registro de datos.

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Anexo B)

Manual de operación de "Sound Forge"

Using the Mouse

Although using the mouse in Sound Forge is not required, it will make your editing sessions easier. Once you become familiar with Sound Forge you will probably want to use some of the built in shortcuts provided by the mouse and the keyboard. The following list of terms will help you when reading the manual.

Pointing	Moving the mouse pointer over an item is called pointing.
Clicking	Pointing to an item and quickly pressing and releasing the left or right mouse button is called clicking. The manual will let you know whether you need to right-click or left-click on an item to execute a specific function. When there is no specification as to left or right you can assume we mean left-clicking. Right-clicking is often used to reach Shortcut Menus.
Double-Clicking	Double-clicking is the same as clicking except instead of pressing and releasing the mouse button once you do it twice in quick succession. Double-clicking always indicates clicking twice with the left mouse button.
Triple-clicking	Triple-clicking is the same as clicking except instead of pressing and releasing the mouse button once you do it three times in quick succession. Triple-clicking always indicates clicking three times with the left mouse button. In Sound Forge, a triple-click in the data window selects all data.
Toggle-clicking	Toggle-clicking involves clicking the right mouse button while holding the left mouse button to toggle through various options. This is a great shortcut for procedures such as drag and drop and changing the *Magnify Tool* mode of operation.
Shift Clicking	Shift-clicking is holding down the *Shift* key on the keyboard while clicking the mouse. Shift clicking is used mainly to skip dialogs so that you can quickly repeat operations.
Control Clicking	Control -clicking is holding down the *Control* key on the keyboard while clicking the mouse. Control-clicking is used to modify the operation of a normal click.
Dragging	Holding down the mouse button while you move the mouse pointer is known as dragging. Dragging is used to quickly move sections of data between separate windows and to move trackbars, scrollbars, faders.
Slow-dragging	Holding down both the right and left mouse buttons while moving trackbars, and faders increases the resolution of the movement. This is especially useful when making fractional adjustments to parameters in a dialog box.
Dropping	After dragging an item, releasing the mouse button on top of another area is known as dropping. Dragging and dropping is used to speed up operations like mixing or moving regions within the Playlist.

The Main Screen

When you start Sound Forge, you see the main screen, or work space, where you will do all your editing. When you first open Sound Forge, no Data Windows are open and you will need to either open an existing sound file or create a new one. There are a variety of ways to do this, all of which are explained later in the manual. The following list briefly describes each part of the screen.

Program Title Bar
Shows the program name and the name of the currently active data window (if the data window is maximized within the workspace).

Data Window
Each opened sound file has its own data window. Data windows can be arranged, resized, or minimized.

Menu Bar
Shows the menu headings for the available functions. When no data windows are open, the Process, Effects, and Tools menus are not listed because these contain functions which require an open data window.

Status Bar
On the left, help and processing information is displayed. The fields on the right show the playback sample rate, sample size, mono/stereo, total length of the active data window, and the total free storage space. These fields can be edited by double-clicking or right-clicking on them (except for the free storage space, of course). When no data windows are open, the fields are blank.

Sound Forge Workspace
This is the background area behind the data windows. You can drag sections here to create new data windows.

TOOLBARS

The first time you run Sound Forge, two toolbars also appear on the screen: the Standard and Transport toolbars. The toolbars contain buttons which are used to quickly execute commands.

Standard
Provides quick access to many commonly used Sound Forge File and Edit menu options.

Transport
Provides the audio transport buttons: Record, Play All, Play Normal, Pause, Stop, Go to Start, Rewind, Forward, and Go to End.
These toolbars, like any other toolbar in Sound Forge, can be dragged and dropped to anywhere on the screen. Toolbars are also resizable and removable. When a toolbar is dragged to any side of the main window, it docks, or attaches to the side. If you drag a toolbar away from a side, it becomes a floating toolbar. To hide a floating toolbar, just click on its Close button.
A list of available toolbars can be displayed by selecting the Preferences command under the Options menu and looking in the Toolbars folder (or Toolbars in the View menu). To show a toolbar, just check the box next to the toolbar you wish to use and then select OK. The number of open toolbars and their position on the screen is entirely up to you.

The Data Window

Data Windows are the windows which contain sound data files. These windows contain a number of sub windows and controls which you will use in editing and viewing your sound data. Many parts of the Data Window lead to Shortcut Menus, dialogs, and other operations.

The following list briefly describes each part and possible mouse operations:

Title Bar	Shows the file name or, if present, the title stored in the *Summary* information of .WAV files. Double-click to maximize and restore the window.
Level Ruler	Shows the amplitude of the waveform. Right-click to reach the *Level Ruler* shortcut menu. Drag to shift the view up or down when zoomed in vertically.
Time Ruler	Shows the current location in the data window as well as ruler tags. Right-click to reach the *Time Ruler* shortcut menu. Drag to scroll the data window.
Ruler Tags	Used to indicate the position of region end points, loop end points, and markers. Right-click to reach the *Ruler Tag* shortcut menu. Drag to change their locations. Double-click anywhere in the region to select.
Edit Tool Selector	Use this button to toggle between the *Edit, Magnify, and Pencil Tools.* Note: The *Pencil Tool* requires that the zoom ratio be between 1:1 and 1:16.
Playbar	On the left side of the playbar are the following audio transport buttons: *Go to Start, Go to End, Stop, Play Normal, Play Looped,* and *Play as Sample.* To the right are the playbar's selection status fields.
Selection Status Fields	Show the beginning, end, and length of a selection. If no selection has been made, only the cursor position (also known as the insertion point) is displayed. Double-click on the left-most field to reach the *Go To* dialog. Double-click on either of the other two fields to reach the *Set Selection* dialog. Right-click to reach the *Status Format* shortcut menu.
Waveform Display	Shows a graphical representation of the sound file. The horizontal axis represents time (marked in the *Time Ruler*) and the vertical axis represents amplitude (marked in the *Level Ruler*). Right-click anywhere on the waveform display to reach the *Waveform Display* shortcut menu.
Position Scroll Bar	Use this to scroll the sound file forward and backward in time to see parts of the file not currently visible in the waveform display.
Overview	Allows for quick navigation and playback of any part of the file. Overview also shows the fraction of the waveform being shown on the waveform display, as well as the selected region. Left-click to move the cursor. Double-click to center the cursor in the waveform display. Right-click to start playback or pause. Left-click and drag to activate the *Audio Event Locator.*
Time Zoom Resolution	(Also called *Zoom Ratio*) Specifies the number of samples of data represented by each point on the screen horizontally. This determines the length of time which is shown in the waveform display. With a small resolution value (1:1, 1:2, 1:4, ...), a shorter length of time is displayed.
Time Zoom In/Out	Use this to change the zoom resolution for the time axis. Between these buttons is a spinner that allows you to continuously change the time zoom resolution.
Level Zoom In/Out	Use this to change the zoom resolution for the level (vertical) axis. Between these buttons is a spinner that allows you to continuously change the level zoom resolution.

Maximize Width	Pressing this button stretches the width of the data window to fit within the Sound Forge workspace.
OLE Drag Source	Drag from this section of the data window into another application such as Microsoft Word, to link the sound file to other documents.

Using the Transport versus the Data Window Playbar

There are a number of ways to play your sound files within Sound Forge. The most common method is to use one of the *Play* buttons located either on the *Transport* toolbar or the playbar in the data window. Let' s take a look at both of them.

The Playbar buttons

On the left-side of the playbar at the bottom of every data window are six buttons. These buttons allow you to play the sound data in a variety of ways. The first two buttons allow you to set the cursor to the start or end of the current file. These are the *Go to Start* and *Go to End* buttons. The next button is the *Stop* button which you can use at any time to stop playback.

The last three buttons play the sound in three different ways and also set the default play mode at the same time. The first button is the *Play Normal* button. This button plays the currently selected section of data. If there is no selection, pressing the *Play Normal* button plays from the current cursor position to the end of the file.

The final button is the *Play as Sample* button. This button is used to play a sound file as if it was present in a sampler. This means the file will play from the start until it reaches the sustaining loop defined for the file and then will loop in the sustaining loop for the number of loops defined. If there are no loops defined the file plays straight through. This is known as a one shot sample.

Whenever you play a file from the playbar, you will notice a small line that appears underneath the play arrow in the corresponding *Play* button. This is the current play mode which will be used whenever you select the *Play* button in the *Transport* toolbar (or hit the *Spacebar*). *Play Normal* is the current play mode in the playbar graphic shown above.

To change the current play mode, press the corresponding playbar button or use *Control+Spacebar.*

The Transport Toolbar

The *Transport* toolbar has seven buttons.

The *Transport* toolbar buttons are described below from left to right:

RecordBrings up the *Record* dialog which allows you to record to either a new or existing window. **Shortcut**: *Control+R*

Play All Plays the entire sound file from beginning to end. This allows you to hear the entire sound even if you have a selection or the cursor positioned somewhere other than the start of the data. **Shortcut**: *Shift+Spacebar*

PlayPlays the file using the current play mode. To set the play mode select one of the three play buttons on the playbar as described above. The last button used becomes the active play mode. **Shortcut**: *Spacebar*

PauseWorks like the *Stop* button in that it stops play of the current file. However when selecting *Pause* the cursor is placed at the current play position rather than back to where it was when play was selected. **Shortcut**: *Enter* during playback

StopStops play and positions the cursor back to where it was prior to selecting play. **Shortcut**: *Spacebar*

during playback

Go to Start — Places the cursor at the beginning of the sound file.
Shortcut: *Control+Home*

Rewind — Shuttles the cursor backward in the sound file.
Shortcut: *Control+Left Arrow*

Forward — Shuttles the cursor forward in the sound file.
Shortcut: *Control+Right Arrow*

Go to End — Places the cursor at the end of the sound file.
Shortcut: *Control+End*

Creating a New Window

To create a new Data Window do the following:

1.Select the New command from the File menu. Sound Forge displays the New Window dialog.
2.Select the new data format in the dialog.

Since we are already working with the TUTOR1 file let's create a new window that has the same data format as TUTOR1.
In the New Window dialog set the Sample size to 16-bit, the Channels to Mono, and the Sample rate to 44,100. When you click the OK button a new window will appear titled Sound2. This is an empty data window into which we are going to place data from TUTOR1.

When you have multiple windows on the screen, only one window is considered the active window. This is the window on which you are currently working. Any operations you perform will only affect this window.

To make a window the active window click anywhere on the window with the left mouse button. The window's title bar will change to the color you have defined as the active window color in Control Panel in Windows.

Copying Data to a New File

Make Wow, sound editing... the active window by clicking on its title bar. If you don't still have the word Wow selected, select it again as we did above. From the Edit menu, select the Copy command. This will copy the sound data for Wow onto the clipboard.

Now make Sound2 the active window by clicking on its title bar (if the title bar is covered by another window, you can always use the Window menu to activate a data window). Select the Paste command from the Edit menu and the Wow data will appear in the Sound2 window. If you press the Play button, you can hear how our new file sounds with just the word Wow.

There are faster ways to copy data from one window to another, or from an existing window to a new window, but we will cover those in a later section.

Saving a File

To save a data window, you first need to make it the active window. Make sure the Sound2 window is active.

1.Select the Save command from the File menu. Since the Sound2 window is a new file, Sound Forge displays the Save As dialog. If the file had been opened or previously saved by Sound Forge the file would be saved immediately.

2.Type a file name into the File name field in the Save As dialog and select the OK button. Let's save the new sound file, Sound2, as MYFIRST Sound Forge will add the file extension, .WAV, automatically.

The Save As dialog also allows you to change file types, data format, and set summary information fields. This is covered in a later section.

Common Edit Operations

The edit operations used most often include cut, copy, paste, delete, mix, and trim/crop. Most of these make use of the Clipboard, which is a temporary storage area which can also be used to move data from one window to another. The following list provides a brief description of each operation:

Cut
Deletes a selected portion of data and copies it on to the Clipboard.

Copy
Copies a selected portion of data on to the Clipboard.

Clear
Deletes a selected portion of data but doesn't copy it on to the Clipboard.

Trim/Crop
Deletes all data in a window except the selected section.

Paste
Inserts the contents of the Clipboard into a Data Window at the current cursor position.

Mix
Mixes the contents of the Clipboard with the current data in a window starting at the current cursor position.

Crossfade
Crossfades the contents of the clipboard with the current data in a window starting at the current cursor position.

To show how these operations are used, we will once again be using the TUTOR1.WAV file. If it is not currently open please open the file now as described in the previous sections.

Copy, Paste, Cut, Undo, and Redo

Copying Data on to the Clipboard

Once you have a selection, you can use the Copy command from the Edit menu. This will copy the selected data onto the clipboard. You will see no change since the Copy command does not change the data, it only copies it to the clipboard.

Pasting Data from the Clipboard

Now move the cursor to the beginning of the file by selecting the Go to Start button on the playbar. To insert the contents of the clipboard into the file, use the Paste command from the Edit menu. You should now see the data for the word "Wow" appear at the beginning of the window. Press the Play button just to make sure. You should hear Wow Wow Sound editing just gets easier and easier.

You have just made your first edit in Sound Forge! There are much quicker ways to do what we have just done with Sound Forge, but we'll get to that in the Advanced Editing section.

Pasting Data to Another Window

Data on the clipboard remains there until it is replaced by another operation which places data onto the clipboard. Therefore, you can continue pasting the data anywhere you want.

To demonstrate this, create a new window as described in the previous section by selecting the New option from the File menu. Now, select the Paste command from the Edit menu once more. You should now have a new data window with the data for the word Wow. You can also do this by selecting the Paste to New function in the Paste Special item of the Edit menu. This creates a new window and fills it with the clipboard contents in one easy step.

Cutting Data

To cut data, first you need to select a section of data you want to cut. Select one of the Wow words (you should have two if you have been following the examples) from TUTOR1.

Now select the Cut command from the Edit menu. This will remove the selected data and place it on to the clipboard.

Undoing an Edit Operation

After any edit operation you can cancel it by selecting the Undo command from the Edit menu.

Let's undo the cut we just made. Select Undo Cut from the Edit menu and you will see the original two Wow words in the TUTOR1 window.

Redoing an Edit Operation

If you change your mind again and decide you really liked an edit you undid, simply select Redo from the Edit menu. Doing this re-performs the edit operation you last undid. In this case selecting Redo would re-cut the second Wow from the TUTOR1 window.

Let's redo the cut. Select Redo Cut from the Edit menu and you will see the second Wow has been cut from the file again.

The Undo/Redo History window (View menu) also allows you to restore your sound file to previous states byundoing or redoing operations. For more information, see the Reference section.

Trimming edges (crop)

Trim (also called Crop) allows you to single out a section of data and cut everything else out of the window except that section. This is a handy feature since you can keep using the Play button to hear selections until you have just the right amount and then get rid of everything else with the Trim/Crop command in the Edit menu.

By now you should be getting used to selecting data on the screen, so select the "Wow, sound editing just gets easier" section in the TUTOR1 window, but don't select the second easier. Remember you can use the Play button to hear how the selection sounds at any time.

Once you have the selection, select the Trim/Crop item found in the Edit menu. After cropping you will have only "Wow, sound editing just gets easier" left in the window.

At this point let's close the Wow, sound editing... window. Either click on the close box of the TUTOR1 window, or select the Close command from the File menu. You will be asked whether you want to save the changes you have made to TUTOR1. Select the No button since we don't want to keep the changes we made to TUTOR1.

Also close any other windows you may have open, like MYFIRST.WAV.

Mixing

Mixing is a powerful and useful edit operation which you will use often. Mixing allows you to combine two sounds together into one window so you can create complex sound effects.

This time we are going to open two files, TUTOR1.WAV and TUTOR2.WAV. Open them now as we've shown you in the previous sections.

TUTOR2 is a file which contains the sound of a snare drum and crash cymbal. We are going to mix this sound with TUTOR1; the "Wow, sound editing..." window.

Before we begin mixing, let's make sure the Status Format is set to Time to make finding the mixing points a little easier. To do this select the item Time from Status Format under the Options menu. You will need to do this for both data windows since Sound Forge keeps track of the format type for each individual window.

To make the windows easier to view during the mix operations you may want to maximize Sound Forge by pushing the Maximize Window button in the upper right-hand corner and selecting the Tile Vertically item from the Window menu. This will arrange the windows vertically fully utilizing the Sound Forge workspace and make things easier to see.

If you activate each of the TUTOR windows you will notice that the length of TUTOR1 is 5.0 seconds long and TUTOR2 is 3.0 seconds long. For this example, we want the drum hit to occur just before the "Wow." We could just copy the drum hit sound on to the clipboard and then paste it before the "Wow", but this would increase the length of TUTOR1 to 8.0 seconds. So instead we'll use the Mix command.

Select all the data in Drum Hit by making it the active window and then double-clicking in the waveform display with your left mouse button (you could also use the Select All command under the Edit menu). Now copy the data onto the clipboard by selecting the Copy command from the Edit menu.

Make TUTOR1 the active window and then select the Go to Start button on the playbar. This will put the cursor at the beginning of TUTOR1. Select the Mix command from the Paste Special option in the Edit menu.

The Mix dialog now appears. Keep both levels at 0 dB and select OK.

You will see that the drum hit sound has been mixed into the TUTOR1 window and the length of TUTOR1 is still 5.0 seconds. Press the Play button to hear the results.

Select the Undo Mix command from the Edit menu to put TUTOR1 back to its original state.

Now let's mix the drum hit sound closer to the Wow portion of TUTOR1. The Wow occurs at about 0.8 seconds into TUTOR1, so move your cursor in the TUTOR1 window to approximately 0.8 seconds. You do this by clicking with the left mouse button in the data window of TUTOR1 and watching the cursor position status field on the status bar (the left most field). You don't have to be exact. Once you've positioned the cursor, select the Mix command again and then hit Play for the result. Notice how the drum hit sound and the Wow sound overlap each other.

Status Formats

By right-clicking on the Time Ruler and selection status fields on the playbar, files can be set to different formats. You can coordinate sound files with other events, or edit to a timing base you feel most comfortable using.

Lengths and positions can be displayed in a variety of formats including Samples, Time, Seconds, Frames, Measures and Beats, and SMPTE.

Selecting a Status Format

To select a format choose the Status Format item from the Options menu. This shows the ten different formats available. Choosing one of these options sets the status format for the current data window.

The available formats are:

Samples. Number of samples

Time. Hours, minutes, seconds and milliseconds

Seconds. Seconds and fractions there of

Time & Frames Hours, minutes, seconds and frames as defined by the Edit Frame Rate (Special Menu)command

Absolute Frames	Frames and fractions there of
Measures & Beats	Measures, beats and 1/4's of a beat
SMPTE Non-Drop	SMPTE at 30 or 29.97 frames per second (fps) non-drop
SMPTE Drop	SMPTE at 30 fps with drop frames
SMPTE EBU	SMPTE at 25 fps
SMPTE Film Sync	SMPTE at 24 fps

Using the current file, TUTOR1, let's take a look at how the status formats affect values in the status display fields. First, select the Samples format from the Status Format menu under the Options menu.

Now select all of the data in the TUTOR1 window. To do this choose the Select All option from

the Edit menu. This will select all data in the window. You can also select all of the data in a window by triple-clicking the left mouse button anywhere in the waveform display of the data window.

In the selection status fields on the playbar (at the lower right hand side of the data window) you should see the values of 0, 240,006, and 240,007. This means that the first selected sample (Selection Left) is sample 0, the last selected sample (Selection Right) is 240,006, and the total number of samples in the selection (Selection Length) is 240,007.

Now select the Time option from Status Format under the Options menu. You will see that all these values change to values specified in hours, minutes, and seconds rather than samples. You can see that a sound containing 240,007 samples with a sample rate of 44,100 Hz will play for 5.000 seconds. You can experiment with each of the status formats to see how each format is displayed.

Configuring Frames and Measures & Beats

When setting the status format to Frames or Measures & Beats, there is additional information you can provide to Sound Forge to customize how these values are displayed. The Edit Frame Rate dialog in the Special menu allows you to change the frames per second. In the Edit Tempo dialog, also in the Special menu, you can specify the Beats per minute and Beats per measure values used to calculate measures and beats. The default values for Frames and Beats are set on the Status page in the Preferences folder (Options menu).

Selecting with the keyboard

The keyboard selection controls allow you to quickly select data or update a selection accurately. For example, say you want to extend the selection end by a small amount. First make sure that the cursor is at the end of the selection. You can move the cursor from one end of the selection to another by pressing the *Home* (moves to the start) and *End* (moves to the end) keys. Use the C key to center the cursor in the waveform display. You can then use the *Shift+Right* arrow and *Shift+Left* arrow combinations to extend the selection end point by small increments.

The following list shows the available keyboard commands for selecting data.

Press	**To select from cursor to...**
Shift+Right arrow	the next screen pixel.
Shift+Left arrow	the previous screen pixel.
Shift+End	the last sample visible in the waveform display.
Shift+Home	the first sample visible in the waveform display.

Press	**To select ...**
Shift+Page Up	10% of the current view past the cursor position.
Shift+Page Down	10% of the current view previous to the cursor position.
Shift+Control+Right arrow	2% of the current view past the cursor position (see below).
Shift+Control+Left Arrow	2% of the current view previous to the cursor position (see below).
Shift+Numpad +	the next sample.
Shift+Numpad -	the previous sample.
Shift+Control+Numpad +	10 samples past the current position.
Shift+Control+Numpad -	10 samples previous to the current position.

> In Windows 95, *Shift Numpad +* will not work unless the *Numlock* indicator on the keyboard is lit.

Also, if there are regions, markers, or loops present in the data window:

Press	**To select from cursor to...**
Shift+Control+Right arrow	the next region start/end or marker.
Shift+Control+Left arrow	the last region start/end or marker.

As you can see from the above lists, Sound Forge has extensive keyboard support for selecting data. You will find that almost any operation has an equivalent keyboard shortcut which advanced users find invaluable. For a complete listing see Appendix A.

Let's take a quick look at how to use some of these keys. Open the file TUTOR1.WAV as we've done in

previous sections. First, make sure that you're using the *Edit Tool* by selecting it in *Tool* under the Edit menu. Now make a selection that encompasses the word Wow with a generous amount of space on each side of the word. Pressing the *Play* button you should hear a little bit of silence, Wow, and a little more silence.

Choose the *Zoom Selection* command from either *Zoom Level* or *Zoom Time* in the View menu. This will fit the selection on the screen with the best possible resolution. Now let's adjust the right side of the selection.

Grab the end of the selection with the mouse and drag to the right. Adjust the selection to be close to the end of the word Wow and let up on the mouse button. Now let's do the same thing with the keyboard. Hold down the *Shift* key and press the *right* arrow key. The selection will extend to the right by one screen pixel. If you hold down the *Shift* key and press the *left* arrow key, the selection will decrease by one pixel. One screen pixel is equal to the number of samples shown in the *Zoom Ratio* field. You can move the end of the selection in this manor until you've got the selection just right.

Now let's adjust the start of the selection. Since the cursor is at the end of the selection, any keys we press for selecting will adjust the end. So we need to put the cursor at the front of the selection. To do this, press the *Home* key. You will see the cursor jump to the start point of the selection. Now, use the selection keys to adjust the start of the selection.

A selection can also be updated on a per sample basis rather than a pixel basis. If you look in the above list you will see that the *Shift + Numpad + (plus)* and *- (minus)* keys are used for these operations. This allows you to get the exact selection you need without having to change the *Zoom Ratio*.

The Overview

While making selections and navigating through a sound file, you probably noticed the overview (the thin bar directly underneath the title bar) change. The overview represents the length of the entire sound file, as if you were zoomed out all the way. From the overview, you can determine what section of the entire sound file is being displayed, the selection made, and the cursor location.

Getting the Whole Picture

Zoom out all the way on the TUTOR1 window (*Zoom Out Full* in the *Data Window* shortcut menu) and make a selection over the word Wow. Notice that the entire overview has brackets above and below it, since the entire sound file is being displayed. Also notice how the selection and the cursor are displayed on the overview.

Now press the *Zoom In* button a few times (the large magnifying glass in the lower right-hand corner of the data window) and notice how the brackets become smaller. This corresponds to the smaller fraction of the entire sound file which you can see when you zoom in on the waveform display. The selection size, however, remains the same and does not move. Even when you can't see them on the waveform display, you always know where the cursor and the selection are in the sound file by referring to the overview.

You can also change the cursor position by left-clicking anywhere on the overview. As always, when you change the cursor, you lose your selection. Remember you can use *Toggle Selection* if you want to restore it.

Fast Navigation and Playback

When you left-click outside the bracketed region in the overview, you will not be able to see the cursor on the waveform display. However, double-clicking anywhere on the overview will move the cursor and center the waveform display to the selected position in the sound file.

You can also play back the sound file starting from the current cursor position by right-clicking anywhere on the overview. Right-clicking again pauses playback. Left-clicking in the overview also moves the cursor position. Also note that left-clicking on the overview during playback moves the cursor to the point where you clicked and continues playback at that point. These navigation tools make it very easy to find sections in large files.

As an example, say you wanted to move the cursor to the beginning of a phrase in a speech. You can right-click on the overview bar to begin playback and then left-click at different positions within the overview until you find the right start point. Once you find the start point, you can press the *Stop* button to stop playback. The cursor should now be positioned at the last spot on which you left-clicked in the overview; select *Center Cursor* from the Special menu and you are ready to edit.

Audio Event Locator

Holding down the left mouse button and dragging it in the overview bar will begin playback of small looped portions of audio around the cursor position. While this is not technically a scrub function, it serves a similar purpose i.e., it allows the user to hear brief segments of audio material in order to quickly scan or locate events within the sound file. The length of the *Audio Event Locator* loop segment can be adjusted in the *Preferences* dialog.

Advanced Editing and Navigation

Making a selection using the Set Selection dialog

If you need to select data at specific points, the Set Selection dialog allows you to type in selection points or choose a selection from a list of regions. To reach the Set Selection dialog, choose the Selection|Set command from the Edit menu.

In the Set Selection dialog, you can modify the Start, End, Length, and Channel of the selection. Pre-determined regions can also be chosen from the Selection drop-down list.

Also, in this dialog you will find Snap Zero and Snap Time buttons. Pressing one of these buttons will force the current start and end selection points to their nearest zero-crossings or time increments, accordingly. A more thorough explanation of these functions can be found in the Reference chapter under Selection in the Edit menu section.

Many commonly used functions in Sound Forge can be performed in a number of different ways. For example, you can reach the Set Selection dialog by double-clicking on the playbar field to the left of OLE, or you can pick the Selection item from the Waveform Display shortcut menu. Sound Forge has been designed to allow you to choose how you want to work. It doesn't force you to work in a certain way. To avoid confusion in our demonstrations, we won't always tell you about every method of accomplishing the same task. Refer to the Sound Forge Reference chapter and the Appendix section on shortcut keys for more information on each feature.

Extending a Selection the Mouse

After selecting a section of sound data, you will sometimes find that the start or end points are not exactly where you want them to be. You could just re-select the data, but it is often difficult to get the start or end points just right.

Sound Forge allows you to update the selection by grabbing a selection edge and moving it. Once you have established a selection, place the mouse over the selection start or end point. You will notice that the cursor changes to a bi-directional arrow. Once this arrow appears, you can press the left mouse button and move the selection to a new position. The new position will be updated once you let up on the mouse button.

Snapping a Selection to Zero-crossings

If after making a selection, the end points jump somewhere else automatically, its probably because you have Auto Snap to Zero on. You may want to enable Auto Snap to Zero (under the Options menu) so that any drag selections start and end points will always reside on a zero-crossing.

To make a current selection snap to zero-crossings, select Edit|Selection|Snap to Zero (or press Z on the keyboard).

If you'd like Auto Snap to Zero disabled only when zoomed in (1:1 or 2:1), select the Disable auto-snapping below 1:4 zoom ratios option in the Editing page in the Preferences folder.

Using the Go To dialog

To quickly move the cursor to a specific point and center it in the waveform display, use the Go To command. You can reach the Go To dialog in a number of different ways:

Use the Go To item in the Edit menu
Right-click on the waveform display and select Cursor|Go To from the shortcut menu

Double-click on the left-most selection status field
Press Control+G

The Go To dialog is much like the Set Selection dialog described below. You can type in the location where you want to go or use one of the predetermined locations from the list. To create your own location marker, press the M key at any cursor position. You can also drop a marker at any time during playback and recording by pressing M. Refer to the Regions List and Playlist sections for more information on using markers.

Using Views

If you wish to save the selection points you've set, the zoom ratio, or the position of the waveform display, you can do so with Views. Sound Forge has the ability to store up to eight views for each data window. Each view stores the selection, cursor position, magnification, and position scroll bar placement. A saved view can later be instantly restored.

You can store and recall up to eight different views (1-8) in this manner. There is also a Views toolbar you can use (look in the Toolbars folder of the Preferences dialog) to set and restore views. When using the Views toolbar, all stored views are indicated by an underscore in each View button.

Follow these steps that demonstrate how to use views:

1. Open the file TUTOR1.WAV and select Wow.

2. To store the current view, press Control+1.

3. Now, zoom in and make a different selection anywhere you wish. Store this new view by pressing Control+2.

4. To return to the first view you stored, press 1. Notice that the selection and zoom factor are restored.

5. To go to the second view you created, press 2.

Drag And Drop Operations

You can perform a mix, paste, or crossfade by dragging a selection from one data window and dropping it on another.

To drag and drop:

1. Open two sound files and select *Tile Vertically* from the Window menu just to make them easier to work with. One will be called the source window and the other, the destination window.
2. Press and hold the left mouse button in the selected area of the source data window. While holding the mouse button down, move the cursor until it changes to an arrow dragging a little box.
3. Drag the cursor onto the destination window. You will see a shaded block that represents the range of the source material. You will also see that the little box accompanying the cursor now contains an M(Mix), C (Crossfade), or P (Paste). Position the block at the place in the destination window where you would like the mix, paste, or crossfade to occur.
4. Let go of the left mouse button. This will bring up the *Mix* dialog. To perform a crossfade instead of a mix, hold the *Control* key down while letting go of the mouse button. Holding down the *Alt* key when dropping performs a paste.

Tip: An easier way to select whether you will perform a mix, paste, or crossfade is to simply drag the block to the destination window and then while holding the left mouse button, click the right mouse button to toggle between the *Mix*, *Paste*, or *Crossfade* functions. You will see the block change according to the method; a mix will look like a solid block, a crossfade will look like an X (or perhaps, a butterfly), and a paste will be represented by a segmented vertical line rather than a block.

As we did in the previous section on mixing, open the two files, TUTOR1.WAV and TUTOR2.WAV. For this example, TUTOR1.WAV will be the destination window and TUTOR2.WAV the source window.

To make the windows easier to view while doing the mix operation you may want to select the *Tile Vertically* option from the Window menu.

Highlight all the data in TUTOR2 by making it the active window and triple-clicking in the waveform display. Now drag the selected section by pressing and holding the left mouse button in the data window of the TUTOR2 window. Notice that the cursor changes to a pointer with a small box when you begin dragging. Drag the block to the beginning TUTOR1 data window and let go of the mouse button to drop the section.

When you let go of the mouse in the TUTOR1 window, you will see a dialog which shows the TUTOR2.WAV window as the source and TUTOR1.WAV as the destination. Leave the levels at 0 dB, and select *OK*. You will see that again the drum hit sound has been mixed into the TUTOR1 window. Press the *Play* button to hear the results.

Drag and Drop Crossfading

Undo the last operation. Now select all of TUTOR2 and drag it toward the end of TUTOR1. Press and hold the *Control* key, you will see the crossfade block and by moving the block back and forth horizontally across the end of TUTOR1, you can adjust the crossfade time and see the crossfade expand and contract over the end of the destination file. Once you have determined where you would like the crossfade to begin, let go of the mouse button. This takes you to the *Crossfade* dialog. Select the *Normal crossfade* preset from the preset list at the top of the dialog and press *OK*. You should hear the end of TUTOR1 fade out as the beginning of TUTOR2 fades in.

Drag and Drop Pasting

Again, undo the last operation. Select all of TUTOR2 and drag it over to TUTOR1. Hold the *Alt* key down while you position the paste point at the beginning of TUTOR1. Now, let go of the mouse button. If

everything was done correctly, you should have pasted the data from TUTOR2 at the insert position in TUTOR1.

Creating a New Window with Drag and Drop
A very useful feature of drag and drop is the ability to quickly create a new window from a selection. Make a selection in a data window and drop it on an empty area of the Sound Forge workspace. A new data window is automatically created containing the data from the selection.

Snap to Event in Drag and Drop Operations
Another useful feature of drag and drop is the ability to snap to markers, regions, time increments and other events in the destination window. All of the drag and drop operations mentioned above will snap (or gravitate) to points in the destination file depending on what events have been established in the file.

The following list shows possible *Snap to* points in the destination file.

Cursor	Start of block snaps to cursor position
Selection	Start of block snaps to start or end points of a selection
Start	Start of block snaps to start of file
End	Start of block snaps to end of file
Markers	Start of block snaps to marker
Regions Start and End Markers	Start of block snaps to region start or end
Time, Measures, Etc.	Start of block snaps to labeled divisions on *Time Ruler*
Video Frames	Start of block snaps to the start of video frames appearing in the video strip

Advanced Mixing options

In the Mix dialog, there are several options you can use to perform complex mixes. For example, when mixing vocals over music, you can have the music fade out and then fade back in when the vocal part is mixed. This is sometimes referred to as ducking. Follow these steps to perform voice-over ducking:

1. Open the file TUTOR1.WAV and select the word Wow.

2. Drag the Wow selection to an open area in the Sound Forge workspace to create a new data window.

3. In the Summary dialog within Properties (File menu), name this sound file Wow in the Title field and press OK.

4. Now, open the file TUTMUSIC.WAV. This file contains a short music clip to which we will mix the Wow sound.

5. Place the cursor in TUTMUSIC at about two seconds from the start of the file.

6. Select all of Wow and drag and drop it to the TUTMUSIC window.

7. In the Mix dialog, select the Slow duck preset. Notice that the Destination Volume is set to -6 dB and the times in the Pre/Post-fade destination edges are set to 0.5 seconds. This means that before and after the mix, the music will be faded to -6 over 0.5 seconds. Press OK.

8. Listen to the file, then undo the operation.

9. Once again, drag Wow to TUTMUSIC and select the Slow duck preset. This time, set the Destination Volume to -20 dB and press OK. The music will now fade out even lower. Both the source and destination volumes can be used to get the right mix of voice and music. The Pre/Post-fade destination edges control how fast the destination sound is faded out and back in.

Editing Stereo Files

When editing stereo files you have two channels of data on which to work. The upper channel is the left channel and the lower channel is the right channel. We will refer to them in both ways left (upper), and right (lower).

Selecting Data in Stereo Files

When selecting data in stereo files, Sound Forge allows you to select either the left channel, right channel or both channels for playing, editing, and effects processing.

When editing a stereo file, the waveform display showing the two channels is split into three logical sections for selection with the mouse. The upper quarter of the waveform display is the left channel hit section, the lower quarter is the right channel hit section, and the middle half selects both channels. When selecting data with the mouse, the cursor location determines what channel(s) will be selected.

Open the file TUTOR1.WAV and convert it to stereo by editing the *Format* under *Properties* in the File menu or by right-clicking on the *Channels* playbar field and selecting *Stereo*. Set the *Channels* to *Stereo* and press *OK*. Select *Both Channels* for the destination in the *Mono to Stereo* dialog. You should now have a stereo version of TUTOR1.WAV.

Move the mouse pointer near the top of the left channel and select the word "Wow." Notice the change to the left channel selection cursor, and that only the left channel of the data becomes highlighted. Now do the same thing but in the middle half of the window near the top of the right channel and the bottom of the left channel. This time you should see both channels being selected. Do this one more time near the bottom of the waveform display and you should see only the right channel being selected.

 Cursor when selecting both channels of a stereo file or when in a mono file.

 Cursor when selecting the left channel of a stereo file.

 Cursor when selecting the right channel of a stereo file.

 Cursor when extending a selection.

Toggling Channel Selections

Once you have made a selection in a stereo file you can switch between channel selections by pressing the *Tab* key. The *Tab* key will cycle between selections of *Left Channel, Right Channel*, and *Both Channels*. You can also set the channel selection by using the *Channel* drop-down list in the *Set Selection* dialog.

Previewing Channels

Selecting a single channel allows you to hear a preview of a single channel in the stereo file. For example double-click (triple-click if it contains regions or markers) in the TUTOR1 window to select all the data (or use *Select All* from the Edit menu). Press the *Play* button and listen to the clip. Next press the *Tab* key to toggle the channel selection into a single channel and press the *Play* button again. Do this one more time to hear the other channel.

Single Channel Editing

Stereo data files are tied together by the nature of their format. In other words, they always play together. This means that there are some edit operations, such as *Cut* and *Paste*, which you can't use on a single

channel. It would leave one channel shorter or longer than the other. This is usually not a problem in real world editing situations. To shift a single channel in time by small amounts, you can use the *Delay/Echo* function.

You can copy a selection from a single channel to the clipboard by selecting the data in either the left or right channel and using the *Copy* command. This will place a mono clip on the clipboard. You can then paste the mono clip to a mono file, both channels of a stereo file, or you can mix it into a single channel or both channels of a stereo file. When mixing mono clipboard data to a stereo file you will be asked with a dialog whether you wish to mix to a single channel or both channels.

Opening an .AVI File

To open an .AVI file, choose Open from the File menu and select Video for Windows (*.avi) from the Files of type list. Then, double-click on the file you wish to open. If the .AVI file being opened in Sound Forge contains exactly one video stream and one audio stream, it will open these streams automatically. However, if no audio is present an audio stream will be created containing only silence for the entire length of the video.

Handling Multiple Streams

.AVI files can contain more than one video or audio stream. A stream is not the same as a track in a multi-track video or audio editor. Multiple streams are most commonly used to contain different versions of a video or audio track. For example, you could have an .AVI file with one video stream and multiple audio streams in different languages. An .AVI player, such as Microsoft's Media Player, can detect which language version of Windows your computer is using and automatically play the correct audio stream for that language.

If more than one stream exists you have the option of choosing which one will be opened in Sound Forge. This is done in the Video Stream dialog. In this dialog, you must select a video and audio stream to open by using the Stream Selectors (black diamonds) to the left of each stream. Once you've selected one of each, press OK.

Attaching a Video to a Sound File

To attach a video to an opened sound file, select Properties from the File Menu and go to the Video folder. Pressing the Attach button will take you to the Attach Video dialog, where you can select an .AVI file to attach a video from. Press OK after selecting an .AVI with a video stream.

The Video Properties will now display the audio and video streams in the .AVI. An .AVI file can contain multiple streams, but in most cases you'll have one audio stream and one video stream.

The square checkbox to the left of each stream indicates which streams will be stored when you go to save your file. The black diamond next to it is the Stream Selector, which indicates which streams are currently being used in Sound Forge.

Press OK again and you should now see the video strip above the waveform display. Once you're done editing, you must save the file as an .AVI if you want to store the video.

Saving an .AVI file

To save an opened file in the .AVI file format, follow these steps:

1. In the Save or Save As dialog, select Video for Windows (.avi). After naming the file, etc.., press Save.

2. The Video Save Options dialog appears next. In here, you can select which streams to store in the .AVI file by checking the square checkbox to the left of each stream. In this dialog, it is also possible to edit the titles of the streams.

3. Pressing OK will take you to the Compression Options dialog. Here, you can select a compression scheme for each audio and video stream. To change the options for a stream, select it and press the Options button. By checking the Interleave every _ Frames option, you can specify how frequently the audio chunks are interwoven with the video.

4. If you pressed the Options button, yet another dialog, Video Compression, let's you select from different compression algorithms, and even go to another dialog to set specific compression

configuration parameters. For more information on compression, see the next section. Selecting No Recompression saves the stream in its original format, which is the Sound Forge default.

5. Once you're done setting compression options, hitting OK several times will complete the process. If the video is long and/or the compression scheme selected is slow, saving the file might take a while. However, if you didn't change any video compression formats, the save will be much faster, since no recompression takes place.

.AVI Video Compression

If you thought audio files chewed up your hard-disk space quickly, wait until you start using video! CD quality audio takes up about 10 MB of hard-drive space per minute:
(60 seconds x 44,100 samples per second x 2 tracks for stereo x 2 bytes per 16-bit sample). On the other hand, a typical video for multimedia use will easily contain about 200 MB per minute, and this for a small window of video:
(60 seconds x 15 frames per second x 320 x 240 x 3 bytes for 24 bit pixels).
Using uncompressed video as a final distribution format is out of the question for most practical purposes. Video compression is a necessary evil.

Mono to Stereo and Stereo to Mono Conversions

For demonstration purposes, open the file TUTOR1.WAV located in the directory where Sound Forge 4.0 was installed (in most cases this will be C:\Forge40). To convert the file from mono to stereo, right-click on the status field which has the word *Mono* and select *Stereo* from the shortcut menu.

When you do conversions from mono to stereo, you will be presented with a dialog which asks you where you want to put the data. Your choices are as follows:

Left Channel The mono data is placed in the left channel. The right channel is set to silence.

Right Channel The mono data is placed in the right channel. The left channel is set to silence.

Both Channels The mono data is copied into both channels.

When performing stereo to mono conversions, the following options are available:

Left Channel Mono data is taken only from the left channel of the stereo file.

Right Channel Mono data is taken only from the right channel of the stereo file.

Mix Channels Mono data is created by mixing both channels of the stereo file.

For now let's put the data in the left channel so we can get a feel for how the function works. Click the radio button next to *Left Channel* and select the *OK* button.

You will now have data in the upper half of the data window (the left channel) and silence in the right channel. Press the *Play* button and you will hear "Wow, sound editing just gets easier and easier" in only the left channel.

> If your card supports only mono data you will still be able to play stereo files if you set your playback device to Sound Mapper in the *Wave* section of *Preferences* in the Options menu.

For now let's go back to a mono sound file, but we'll do it in a different manner. Select the option *Properties* in the shortcut menu that appears when you right-click on the waveform display. In the *Properties* dialog select the *Format* tab. This page allows you to change all the parameters at once. Set the radio button for *Channels* to *Mono* and select the *OK* button. Select the *Left Channel* for the source channel in the *Stereo to Mono* dialog and we're back where we started.

> The above steps were used for demonstration purposes. Simply using *Undo* would have been much more efficient.

Channel Converter

The *Channel Converter* (Process menu) is also used to convert between mono and stereo formats. It allows independent level settings for each channel and can be used to inter-mix the left and right channels of a stereo file to create interesting pan effects. For simple conversions, use the included presets. See Channel Converter later in this manual in the Process menu section of the Reference chapter for more detailed information.

Converting 16-bit samples to 8-bit samples

To save storage space, 16-bit sound files are often converted to 8-bit files. However, when you represent a sound file with only 8-bits, an audible distortion referred to as quantization error becomes very prominent. To minimize quantization error, there are several things you can do to the 16-bit sound file before converting it to 8-bit. You can:

Apply a Noise Gate (Effects menu) to completely mute out the silent parts in a sound file. Often, a low level signal in a 16-bit sound file will become noise after the 16- to 8-bit conversion, so it's best to have complete silence between the sound parts.
Apply dynamics compression (select Dynamics|Multi-Band in the Effects menu) to the sound file. A small amount of compression (2:1 or less the presets are usually sufficient) will lower the dynamic range of a sound, making it easier to represent using 8-bit samples.

Normalize (Process menu) the sound to 0 dB (peak). This ensures that the entire dynamic range available in 8-bit samples is used and lowers the signal to noise ratio.

You can apply both dynamic compression and normalization at once by using the Normalize function with theAverage RMS power option. Set Apply dynamic compression in the If clipping occurs drop-down list.

Once you have performed the above operations, you should use Convert to 8-Bit in the Process menu to do the 16 to 8-bit conversion. Sound Forge provides three different 16 to 8-bit conversion options; Truncate, Round, and Dither. Truncate simply removes the lower 8 bits and they are lost forever. Round is similar to Truncate, only some attempt is made to represent the highest of the low bits by rounding up if possible. Dithering is used to mask the quantization noise with less obtrusive noise. In the Convert to 8-Bit dialog, set the Dither bit depth to a low value (like 0.1) and increase the value slowly until you reach an acceptable sound.

Remember, an 8-bit sound file will always sound noisier than a 16-bit sound file, so whenever possible, stick with 16-bit. When trying to save space, it is possible to get better results from lowering the sample rate (see Resample under the Process menu covered in the Reference chapter) instead of using 8-bit samples.

Converting Files

When producing audio files you may find that you need to provide the file to a client in a variety of formats. This could be .WAV files with data formats such as 8-bit mono, 16-bit stereo, or even ADPCM. You may need the files converted to Raw data, .VOC, or some other PC format. You may even need to convert to a different platform like Macintosh .AIF files or Amiga .SVX.

We have seen in the previous sections that you can quickly convert between mono/stereo, 8/16-bit, and change the sample rate in Sound Forge. You can then use the Save As command to save the file to a new name, or you can save in a new format within the Save As dialog.

If you don't have TUTOR1.WAV open, open it up now. Select the Save As command from the File menu and the dialog for saving will be displayed.

When the Save As dialog is displayed, there are three controls that are used for file conversion; the Save as type, Format, and Attributes. The Save as type is the list of all available output file types. The Format field sets the format of the data which is saved in the file. The Attributes field controls sample size, sample rate, and the number of channels.

When you bring up the Save As dialog, the Save as type will be set to the type from which the file was opened. The default for new files is Microsoft Wave (.WAV). You can change to the type of file you want to save by selecting the new type from the Save as type list. Notice that the extension of the file name will be changed to reflect the type of file you are saving.

The Format drop-down list shows the format of the data which will be saved in the file. Usually this will be PCM which is the standard for most file types. PCM (Pulse Code Modulation) is a standard format for normal uncompressed audio. If you are saving a file to a file type which supports other formats, they are displayed in the drop-down list. Other formats are typically used when saving audio data in a compressed form.

The Attributes drop-down list shows the sample size, channels, and sample rate which will be stored when saving this file. Examples include: 11,025 Hz, 8-bit Mono or 44,100 Hz 16-bit stereo. You can quickly change the attributes of the data by selecting one of the options available in the drop-down list. When you change from a mono file to a stereo file using the Attributes field, that data is copied to both channels. If you change a stereo file to a mono file, the data is mixed to one channel.

When you change the Save as type you may notice that the Format and Attributes fields will also change. This is because not all file types support the same types of sound data. For example the Dialogic .VOX format only supports 16-bit mono Dialogic ADPCM files. This means you can't store stereo 8-bit data in this file. Don't worry, in most cases Sound Forge automatically converts any file you save to an acceptable format.

Microsoft .WAV and .AVI files allow you to store over 30 text fields including: Creation Date, Copyright, Keywords, and a variety of other informational text data. Sound Forge supports viewing and editing any of these fields.

Summary Information

When editing .WAV and .AVI files, the Summary tab is available in the Properties section of the File menu. This allows you to view and/or change basic summary information currently stored in the file.

Extended Summary Information

The Extended Summary dialog consists of a list of available fields, each of which may or may not have attached text. The Fields list shows the abbreviation of the field type, a short description, and if the field is currently empty, the word (Empty) appears after the short description. Below the list of fields is the Contents which shows the contents of that field. At the bottom of the dialog is a longer description of the current field.

To the left of each field in the list is a check box which is used to enable or disable fields of this type when saving .WAV and .AVI files. The field is enabled or disabled by clicking on the check box. If a field is empty, i.e. has no text associated, enabling the check box has no effect on a saved file. Field information is only saved if text information exists for that field.

The Save Summary Information in .WAV/.AVI files check box in the Save As dialog is used to quickly enable/disable saving of all summary fields to a file during a Save As operation. This allows you to quickly strip all summary information from a file.

For a description of the fields available refer to the Properties within the File menu section in the Reference chapter later in the manual.

Default

If the Default button is selected, the text in the summary fields is saved with the defaults fields that are automatically filled when creating a new .WAV file. The Creation date field (ICRD) is always filled with the current date for new files. Saving a custom default setup is handy for saving copyright and engineer information for new files created at your site.

Open the file TUTOR1.WAV and select the Summary tab from Properties in the File menu. This will show you the Summary dialog. Press the Extended button and notice that the default for

saving summary information is to have all fields enabled. The fields which have already been filled in for TUTOR1.WAV are Comments, Copyright, Creation Date, Engineer, Keywords, Name/Title, Product, Subject, Software, and Source. Scroll to and select each field. You will see the embedded text for each of these fields.

Additional Embedded Information

The Microsoft .WAV and .AVI file formats allows non-text data to be embedded in the sound file. If you open and edit a file which has additional information created by other software, Sound Forge will keep track of this data and place it back in the file when you save to the original format.

If you wish to add or remove additional data (such as embedded bitmaps, metafiles, etc.), you can use the Save As item from the File menu. When you save data using the Save As option, Sound Forge will ask you if you wish to copy the additional non-audio information to the new file. At this point you can answer either Yes to place the additional information in the new file or No to save only audio data and any additional data types you have selected.

Sound Forge will only prompt you to save if such data exists.

Recording basics

Video tutorial

To start a record session you can either select *Transport* then *Record* from the Special menu or press the *Record* button on the *Transport* toolbar. The *Record* button is the first button on the *Transport* toolbar with the red circle on it.

> If you experience problems recording, refer to the Troubleshooting chapter for information on common recording problems.

After pressing the *Record* button or selecting *Transport|Record* from the Special menu, you will be presented with the *Record* dialog. Notice that the window into which you will be recording has its title displayed in the dialog title.

> Warning: The *Record* and *Record Remote* dialogs are always destructive and contain no *Undo* capabilities.

To prevent accidentally recording over sound data, record into a new or scratch data window and paste the takes you want to keep into the desired sound data window. For extra safety Sound Forge automatically defaults to record in a new window when the current sound file is opened in direct edit mode.

In the upper left corner of the dialog are the *Recording attributes*. These are the record sample rate, sample size, and number of channels which will be used when recording. These attributes are applied to the data window into which you will be recording. If you want to change these attributes, exit the *Record* dialog and change them in the data window, record to a new window, or record to another window.

Recording to a New Window

If you want to record to a new window rather than the currently selected record window, select the *New* button found at the upper right of the *Record* dialog. This brings up the *New Window* dialog where you can specify the *Sample rate, Sample size,* and *Channels* for the new data window. These attributes will be applied while recording.

Selecting an Alternate Record Window

If you wish to record to a window other than the one currently displayed in the *Record* dialog title, you can do so by selecting the *Window* button. Pick the window you want to record to from the drop-down list in the *Record Window* dialog and select *OK*. The title of the window you select will now appear in the *Record* dialog title.

Recording Modes

Sound Forge has four different modes of recording. These are Automatic Retake, Multiple Takes with Regions, Multiple Takes (no Regions) and Punch In. Each mode is described below.

Automatic Retake

The Automatic Retake mode is the easiest method of recording. Recording starts at the position shown in the Start field when you select the Record button and continues until you select the Stop button. Any data which is currently after the position in the Start field will be replaced. When recording is stopped, the start position is reset to the beginning of the take allowing an immediate review and retake if desired.

Automatic Retake is the default mode when recording into an empty Data Window or when you select the record button with no data selected in the current Data Window.

Multiple Takes with Regions

The Multiple Takes with Regions mode allows multiple takes to be recorded and each take with automatically have a Region defined in the Regions List. Recording starts at the position shown in the Start field when you select the Record button and continues until you select the Stop button. Any data which is currently after the position in the Start field will be replaced. When recording is stopped, the start position remains at the end of the next take allowing the take to be recorded immediately.

Multiple Takes (no Regions)

The Multiple Takes (no Regions) mode allows multiple takes to be recorded, but no Regions are defined in the Regions List. Recording starts at the position shown in the Start field when you select the Record button and continues until you select the Stop button. Any data which is currently after the position in the Start field will be replaced. When recording is stopped, the start position remains at the end of the take allowing the next take to be recorded immediately.

Punch In

Punch In mode is used when you want to record over a region of data in an existing Data Window. Recording starts at the position shown in the Start field when you select the Record button and continues until you select the Stop button, or the length of the data recorded is equal to the length in the Length field. This makes it easy to record over a section of audio without effecting the rest of the file. You can use the Play button to hear the selected Punch In region at any time.

You may adjust the Punch In region by changing the values in the Start, End, or Length edit fields. You may also adjust the format of these fields to a variety of different display status formats by selecting a format from the Input format drop down list box.

Punch In mode is the default mode when you select the Record option while you have a region of data selected in the current Data Window.

Using Pre/Post-Roll with Punch In Mode

At the bottom of the Record dialog are two edit fields which contain the Pre-Roll and Post-Roll times. These can be used when listening to a region in Punch In mode. These times define the amount of audio you will hear prior to (Pre-Roll), and after (Post-Roll), the selected region when using the Play button. This allows you to hear the transitions between the Punch In region and sound before and after the region. If you wish to use the Pre/Post-Roll option you must check the Review check box at the bottom of the dialog. To disable Pre/Post-Roll uncheck this box.

Using the Prepare Button

The Prepare button is used when you need Sound Forge to begin recording as soon as possible after selecting the Record button. The Prepare button opens the wave device and loads all recording buffers in order to minimize the time between selecting the Record button and sound actually beginning to be recorded.

The Prepare button is optional. It is not necessary to select this button prior to recording, however it does allow for more accurate takes in the Punch In mode.

Recording Status

While you are recording, the amount of time recorded will increase and the Time left on drive will decrease. Make sure and keep an eye on your Time left on drive if your available record time is limited. It's never fun running out of recording time!

Available Recording Time

Near the bottom of the dialog you will see the Time recorded and Time left on drive fields. These two boxes show how much time you have recorded and how much time is available on your hard drive for additional recording. If your Time left on drive field is displaying a limited amount of available time you may want to free up some space on your hard drive or pick an alternate drive where Sound Forge stores its temporary files. You can get more information on temporary file usage by referring to the Reference chapter on Temporary Storage.

Finishing Recording

When you have finished recording select the Close button to exit the Record dialog and return to normal editing mode.

Previewing Recorded Sounds

After recording your material, you can listen to what you have recorded by selecting the Play button. You can also listen to the section over which you plan to record in Punch In mode. To stop playing select the Stop button at any time.

Record Meters

Like the Sound Forge Play Meters, the Record Meters can be scaled to view differing dynamic ranges by right-clicking on the meters and selecting the appropriate range from the shortcut menu. For most recording situations it is probably best to select -42 -to 0 dB, as this is the most practical range to view a good record signal. To view very low levels, select -90 to 0 dB. This is a good way to measure the amount of noise you have in your system due to noisy sound sources and/or poor equipment (such as an inexpensive sound card).

Also in this shortcut menu, you can set the meters to Hold Peaks and Hold Valleys. It is recommended that Hold Peaks be checked, as this is a good way to view the peak levels while setting the record level (see below). To reset the current peak, single-click on the meter's text output (just above the meters).

For Windows 95 and NT 4.0 keyboard shortcut lovers, the Play Meter shortcut menu can be reached by thekeyboard shortcut Alt+Spacebar.

Checking Record Levels

Sound Forge allows you to check the level of your input source before recording begins. To view your levels engage the Monitor check box. The meters will light up in relation to the level of the incoming signal. For best results, the level should be somewhere in the yellow range with an

occasional red. Once your levels are checked you can immediately begin recording by selecting the Record button. If you do not see the meters light up, you may have your mixer levels or input source set incorrectly. You can refer to the Troubleshooting chapter for more information on these problems.

Adjustıng Levels Using the Peak

The peak values displayed above the level meters are useful for maximizing your input level without clipping. When recording you generally want your input signal to be as hot as possible without clipping. By this we mean you want your input levels to be as high as possible without exceeding the range of values which can be stored digitally when recording. When you clip, the peaks of your waveform become clipped off resulting in distortion. The peak values show you (in decibels) the highest peak that you have reached since hitting the Monitor button.

To adjust your levels, select the Monitor check box so that Sound Forge begins to listen to your recording device. This is just like recording except that Sound Forge doesn't store any of the data it receives. Apply an input signal by speaking into your microphone, playing your CD, or whatever it is you're trying to record. If the peak value stays at a low value, increase the levels of sound you are supplying so that the peak value is somewhere in the -6 dB range. If the peak reaches 0 dB then you have clipped and will see the word Clip above each meter. Once you lower your input levels, right-click on the meters and select Reset Clip to clear the current peak value. Sound Forge always keeps the maximum peak displayed above the meters or via Hold Peaks.

Once you have adjusted your levels you can immediately begin recording by selecting the Record button or end monitoring the levels by un-checking Monitor below the meters.

It is particularly important to record sounds with the hottest levels possible when you plan to later convert 16-bitdata to 8-bit. This assures that you will use the greatest dynamic range possible ın an 8-bit file (which uses fewervalues to represent the waveform).

Applying Simple Processes and Effects

To apply an effect, first select a section of data on which you wish to operate. To select the entire file, double-click (triple-click if regions or markers are present) on the waveform display.

If you don't have a selection when you perform an effect which requires one, Sound Forge will apply the effect to theentire file.

To show how effects are used we will once again be using the TUTOR1.WAV file. If it's not currently open, please open the file now.

Select the Reverse item from the Process menu. The Reverse operation reverses the data selection, making it sound like it's playing backwards. Once the operation has finished, press the Play button to hear how TUTOR1 sounds when played backwards.

Applying an Effect to a Section of the Sound File

Select the Undo Reverse item from the Edit menu to put TUTOR1 back to its original state. Now select only the word "Wow" in the window and again select the Reverse item in the Process menu. Play the file again and notice how only the word "Wow" is played backwards. After you have listened to the effect, undo the reverse again so we can try another effect.

Again, let's select only the word "Wow" in the TUTOR1 window. This time after selecting the data, select the Volume item in the Process menu. Use the scale factor fader to set the scaling to -6 dB (50%). Clicking on the fader and using the up/down arrows will give you more precision. Now select OK. If you press Play you will notice that the volume is now at 1/2 of its original volume. You can undo the last operation by selecting Undo from the Edit menu.

The previous two examples show you how easy it is to apply effects to files. Sound Forge has a large number of different processes and effects, ranging from simple volume changes to complex multi-tap reverb/delays. To learn about a particular effect, please refer to the Effects, Process, or Tools menus which are covered in the Sound Forge Reference chapter.

Applying Effects to Stereo Files

In a stereo file, only the selected region in the channel which you've selected is processed. Most functions can be applied to the left, right, or both channels. The only functions which cannot be applied to separate left and right channels are functions which affect the length of the data, since each track in a stereo file must be of the same length. These include Insert Silence, Resample, Time Compress/Expand, Gapper/Snipper, Pitch Bend, and Pitch Shift (without preserving duration).

If you need to run a process like Insert Silence in only one channel, you should divide the stereo file into two mono files first, insert the silence, and then join them back together into a stereo file. Separating stereo files into two mono files is a good idea if you are going to be changing the duration of each track by cutting or inserting space to synchronize different events.

Applying a Function to a Single Channel in a Stereo File

Previously, we reversed TUTOR1 so that we could hear how the data sounded when played backwards. Now let's try this on a single channel of a stereo file. First convert TUTOR1 to stereo by right-clicking on the status field which has the word Mono and select Stereo from the shortcut menu as we did in a previous section. Make sure to select the Both Channels option in the dialog so we have data in both channels of the new stereo file.

Select the entire left channel by triple-clicking with the mouse in the upper 1/4 of the TUTOR1 waveform display. If you select both channels, just use the Tab key to toggle the selection to only one channel. Now select the Reverse item from the Process menu. You will notice that only

the left channel data is reversed. Press the Go to Start button on the playbar to clear the selection and place the cursor at the start of the file. Press the Play button and you will hear "Wow, Sound editing is easy" backwards in the left channel and forward in the right channel. If you only hear one channel then you are in single channel preview mode. To hear both channels use the Tab key to toggle the cursor or selection to encompass both channels and again press the Play button.

If you want more information on how to use a function, press the F1 function key while selecting the function title inthe menus. Also, you can press the F1 function key or the Help button in all function dialog.

Envelope Graph

Envelope graphs are used to draw the shape of a frequency or amplitude envelope that will be applied. The horizontal axis represents time, with the left-most point specifying the start of the selection and the right-most point specifying the end of the selection. The vertical axis represents either amplitude or frequency.

· To create a new knob on the graph, left-click anywhere on the line connecting the envelope points and drag the knob in any direction, sort of like pulling a rubber band.

· You can delete a knob by double-clicking or right-clicking within it.

· To reset the graph (delete all knobs) click on the Reset button.

Moving Multiple Envelope Points

It's possible to select and move more than one envelope point at once. Just try:

1. Clicking on an unused section of the Envelope Graph.

2. While holding the mouse button down, drag the mouse. A dotted-line selection square will appear.

3. Move the mouse to surround the needed points with the selection square.

4. Release the mouse button. The selected points will now be colored red.

5. To move all of the selected points, drag any one of the points.

You can also select all points by pressing Control+A when the Envelope Graph is active.

Displaying the Waveform on an Envelope Graph

Some envelope graphs (such as in the Fade|Graphic or the Pitch|Bend dialogs) allow you to view the waveform of the selected data region on the graph. If the selection is small, the waveform is automatically displayed. Otherwise, you must press the Show wave check box. If you have a stereo file, you can choose between displaying the Left channel only, Right channel only, or Mix channels in the drop-down list.

Vertical Fader and Horizontal Trackbars

In the *FM Synthesis* dialog, the *Amplitude* is controlled by a fader and the *Feedback* is controlled by a trackbar.

Fader:  Trackbar: 

There is nothing complicated about these controls. To change the parameter values, just left-click and hold on top of the trackbar thumb and drag left and right or up and down.

> You can fine tune a control's value by holding down both the left and right mouse buttons at the same time (or holding down *Control* on the keyboard)

There are many keyboard shortcuts when using faders and trackbars. You can use the *Up, Down, Left* and *Right* arrow keys to change the value in small increments or the *Page Up* and *Page Down* keys to change the value in larger increments. The *Home* and *End* keys change the parameter value to its maximum or minimum.

If you double-click on a fader or trackbar thumb, it returns to its reset value (usually 0%, 50%, or 100%). Left-clicking on the hash marks in a fader also changes the value by very small increments.

Edit Box Spinner Control

In the *FM Synthesis* dialog the *Total output waveform length* and *Frequency* parameters are modified with edit box spinner controls. The edit box is the box containing text, while the spinner is the small control to the right. With this type of control, you have several options for changing a parameter value. You can:

Type in the number by left-clicking on the edit box and then typing in the value.

Increment the value by clicking on the two small up/down buttons.

Use the spinner to change the value. This is done by left-clicking on the center button (between the two up/down buttons) and dragging the mouse up or down. Again, holding down both the left and right mouse buttons at the same time will cause the values to increment in finer steps. You can also use the *Up/Down* arrows and *Page Up/Page Down* keys to alter the value.

Adjust the spinner while holding down both mouse buttons to see the finer increment resolution (or hold down the *Control* key).

Simple Delay

Simple Delay/Echo creates copies of the original sound which are then mixed with the sound file to create simple echo effects.

Open TUTOR1.WAV and select Simple from Delay/Echo in the Effects menu. Choose the Slap-back echo preset and select Preview. A single copy of the sound is heard 0.4 seconds after the original. Changing the Delay time determines the time between the original and echoed sound.

Now, select the Grand Canyon preset. Notice that the Multiple delays/echoes check box is marked. This means that instead of just one echo, you will hear multiple decaying echoes of the original sound. The Decay time determines how long it takes for these echoes to fade out.

The Pre-delay/echo function creates echoes heard before the original sound. Use this effect while the spaceship in your next sci-fi flick travels back in time by means of a wormhole.

Multi-Tap Delay

The Multi-Tap Delay function allows you to specify up to eight delay-taps spaced anywhere within 2.5 seconds (0.5 seconds in 16-bit Sound Forge) of the original sound.

Open the file TUTOR1.WAV and select Multi-Tap from Delay/Echo in the Effects menu.

Now, select Tapped delay, stereo pan from the end of the preset list. To hear the effect, select Preview. Selecting Bypass allows you to listen to the unprocessed file. Listen to how echoes bounce between left and right channels.

This preset uses all eight delay taps. To switch between taps, use the Current Tap function. There is a delay time and an amplitude associated with each delay tap which determine when and how loud the delay tap is heard after the original sound. In stereo files, each tap can also be panned left or right, to simulate sound coming from all directions.

The selected tap is represented as a red vertical line on the echogram. The echogram represents an approximation of the impulse response of the current settings and can be used to estimate the decay time. Blue lines correspond to other active taps and black lines are feedback echoes.

The horizontal axis of the echogram is time, with the right-most point equal to the Graph resolution scale setting. The vertical axis represents the amplitude of the echo. You can change the scale factor between 500, 1,000, or 5,000 milliseconds for viewing the impulse response over different time ranges.

By changing the Feedback, you can change the decay time of the delay.

If you set the Feedback too high, the echoes keep adding up until they are clipped (use the 5000 ms Graphresolution setting). Too much feedback also creates unnatural ringing of some frequencies.

Select the Default all parameters preset. Here, there is only one tap active, with no feedback. This corresponds to a simple delay. Set the Dry out to zero and turn on the Low-pass start frequency. Low-pass filtering removes high frequencies, in the same way that many building materials absorb high-frequency sounds. Adding modulation creates slight pitch changes, which can make a delay sound fuller.

Now, switch to the Chorus-reverse verb 1. Here, the delay taps increase in magnitude over time, thereby creating a swelling effect. Many other sound effects are possible if you experiment a little with tap arrangements.

Noise Gate

When recording a sound, there is often an audible noise floor during silent breaks. Noise is generated by many different things, including electrical equipment, machinery, and traffic outside your window. When your sound source is much louder than this background noise, it is simple to remove the noise during silent breaks, where the noise is most noticeable, with a noise gate.

For example, open TUTOR1.WAV. Move the cursor to a location between Wow and Sound and select Insert Silence (Process menu). Specify 1 second of silence to be inserted at the cursor. Next, create a new file. In the new file, use Synthesis|Simple (Tools menu) to generate four seconds of noise at -60 dB amplitude (keep the frequency around 2,000 Hz). Next, copy all of the noise on to the clipboard and mix it to the beginning of TUTOR1. Use 100% for the noise (Source) and 100% for the voice (Destination). You should now have a file with voice and a relatively low hissing sound in the background.

To remove the noise during silent breaks, first you should analyze the amplitude of the noise. In TUTOR1, select a region with only noise (no voice), and run the Statistics function under the Tools menu. Take note of the Maximum sample value percentage. If you followed the preceding steps, it should be close to -60 dB.

Next, select Noise Gate from the Effects menu.

In the Noise Gate dialog, select the Noise gate 1 preset. Slide the threshold level to a bit over the Maximum sample value (in percentage). A value of -50 dB should be high enough to differentiate the noise from the vocals. Press OK. Notice that the noise during the silent regions should have disappeared (total attenuation). If it didn't, try raising the Threshold level until it does.

The other two parameters in the Noise Gate determine how fast the gate will open and close. This will affect how the beginning and end of the sound will fade in and out. If the Attack time is too slow, the beginning of the vocals might get cut off. Likewise, if the Release time is too fast, the end of the vocals will be cut. Experiment with these times until you can remove as much noise as possible without removing any of the voice.

Compression and Limiting

Compressing and limiting are terms used to indicate effects that lower the dynamic range of a sound. When you compress a sound, you lower the volume of loud sections and then raise the overall volume to compensate. This is done to keep the volume level from fluctuating too much over time. Limiting works exactly like compression, but to a higher degree.

Compression and Normalization can be used together to increase the apparent loudness of a file. This is currentlya popular mastering technique.

Open the file TUTMUSIC.WAV. Make a copy of it by selecting the whole region and dragging it to an open space in the Sound Forge workspace. Now, with the new file active, select Dynamics from the Effects menu and choose Graphic.

The Graphic Dynamics dialog allows you to precisely tailor the gain at all input levels of a signal. The Input vs. Output level graph shows you the gain that will be applied to the input signal, depending on its level over time. The diagonal line, referred to as the No Gain line, indicates where the input and output levels are equal. When an envelope point is below the line, gain reduction occurs.

If you understand the principle of the graph, you can edit its points directly to create your own compression, expansion, limiting, or noise gating curves (see the Reference chapter for more details). However, you don't need to use the graph at all. Using presets and the threshold and ratio trackbars is sufficient for most cases.

Choose the 2:1 Compression starting at -18 dB preset, turn Auto gain compensate off, and select OK. If you can see both files at once and are zoomed out, you'll be able to notice how the levels of the new file are more constant than the original. Listening should reveal the same thing.

In this preset, sounds above the Threshold (-18 dB) are attenuated at an input to output ratio of 2:1. Sounds below the Threshold are not affected by the compressor. The Auto Gain Compensate check box raises the total volume of the file after processing to bring the overall output level back to an acceptable level. Turn it on once and you'll see how the overall level is much higher now. This can also be done manually with the Output gain fader.

Undo the previous operation and select Dynamics again. Now, increase the Ratio to 7:1 and select OK. The sound will be even more compressed, meaning that more attenuation and boosting will be applied to compressed signals.

Too much compression starting at too low of a threshold level will usually lead to a distorted sound.

Again, undo the operation and select the Limit levels to -6 dB (hard limiter) preset. Now, signals above the Threshold (-6 dB) will still be attenuated, and with a huge ratio of Infinity:1. Essentially, after processing, there will be no levels above -6 dB included.

Limiting is often used to keep signals from going above a certain level, but can also be applied to create heavily-compressed effects. Limiting should only be done on peaks; if the Threshold level is set too low, heavy distortions will occur.

Expansion

Dynamic expansion is the opposite of compression and limiting. Any signal below the threshold will be attenuated by a certain ratio. The most common effect of expansion is to attenuate low-level noise, such as a noise gate. However, you can also use expansion to add more dynamic range to a sound.

With the TUTOR1.WAV file open, select Dynamics|Graphic from the Effects menu. Choose the Soft noise gate below -36 dB preset and select OK. Notice how very low-level sounds have been attenuated. This is useful for removing noise from silent regions in a similar fashion as a noise gate.

Multi-Band Dynamics

The other type of dynamics processing that Sound Forge allows for is Multi-Band Dynamics. Essentially this is a compressor that only affects certain frequency bands. The possibilities with this type of compressor are endless, but the most common use is for de-essing and de-popping.

You can also use this function as an advanced EQ for such things as tightening up a bass line or drums.

Open the file SIBIPLOS.WAV. This file contains both loud sibilants (S's) and plosives (P's). Let's first remove the sibilants. Double-click on the region named ...and sibilants to select it. Next, select Dynamics|Multi-Band from the Effects menu and choose the Reduce loud sibilants (de-esser) preset. This preset acts upon frequencies around 5,000 Hz. Previewing the effect should make the S sounds less painful.

Next, make a selection on the region named plosives. This can be done by pressing the Selection button and choosing Region: ...and sibilants. In the Multi-Band Dynamics dialog, choose the Reduce loud plosives and hit Preview. The loud P becomes less obtrusive and unlike EQ, this reduction doesn't affect the entire sound file. It only acts upon the plosives.

There is also a Multi-Band preset called Reduce plosives and sibilants which you can use to remove both S's and P'sat once. This is basically the same effect as running one first and then the other.

When applying these presets to your own files, you will most likely need to change the Threshold setting until only the unwanted sounds are affected. If the Threshold is too low, too much filtering will occur. Setting the filter to -Inf. forces filtering of all the data. Also, you can also boost a band after compression by using the Gain control to compensate for any loss during processing.

Changing Pitch and Time Duration

You are probably familiar with how changing the playback rate of a recording affects its pitch. For example, playing a 33 1/3 RPM vinyl record at 78 RPM makes the Beatles sound like the Chipmunks. Likewise, playing a 78 RPM record at 33 1/3 makes a trumpet sound like a tuba. This concept is used by most sampler units to make a single sound file achieve different pitches.

Open the file SAXRIFF.WAV. Under the Effects menu, select Pitch|Shift.

Next, select the Fifth up preset and select OK. Notice that the length of the file is less than its original size. Listen to the sound to hear both a higher pitch and a faster rate.

Undo the last operation and return to the Pitch Shift dialog. Now, select Fifth down and select OK. The file is now larger, slower, and lower in pitch.

Altering Pitch Without Changing the Duration of the Sound

Undo the last operation and return to the Pitch Shift dialog. In the last two examples, the Preserve duration check box was left unchecked. When you check this box, a completely different algorithm is used to change the pitch of the sound.

Select the Third down preset and check the Preserve duration check box. Next, you must select a mode. Different algorithms are included for different kinds of sounds. These modes are only suggestions, since many will work with different types of sound. It's best to just try a few different ones and choose the one that sounds best to you. For this saxophone riff, the mode named A13. Solo instruments 4 does an excellent job.

Now, preview the sound. The sound file will now have a higher pitch, but it will not sound as if it's being played back faster.

Changing Time Duration Without Changing the Pitch of a Sound

Another Sound Forge process unique to digital processing is the ability to stretch or compress the time duration of a sound without altering the pitch. This is useful for lengthening or shortening sounds to meet a specific time length.

Open SAXRIFF.WAV and select Time Compress/Expand from the Process menu.

This process is very simple to use. In the dialog, you have the ability to specify the final duration of a sound, from 50% to 500% of the original length. Like in the Pitch Shift dialog, you must choose a mode from a list depending on the type of material you're processing. The mode named A13. Solo instruments 4 (less echo) does a good job with this sound file. Change the Final length from 2.5 to 2.0 seconds (80% of original) and select OK. Press the Play button and you should hear the riff played at a faster tempo.

The A and B modes used in both Time Compression/Expand and Pitch Shift without change of duration work in a similar fashion. Modes labeled C are from Sound Forge 3.0. Basically, the reason why there are so many options is that compromises must always be made between having

excellent time localization (no echoes) and accurate frequency reproduction (no low-frequency distortion or flanging).

If you have sounds that have few loud, sustaining low-bass frequencies, you can use modes that will result in no echoes. These include the Drum modes and some of the Solo Instrument modes. For complex music, you must sacrifice some time localization for the ability to reproduce long bass notes.

Since classifying sounds into strict categories is not possible, different settings are included for each sound type. For example, if you have a drum recording with bass drum, snare, and cymbals, you find the A17. Drums, unpitched (minimum echo) does an impeccable job. However, once you start adding ringing low toms and congas, the A18. Drums (better for toms) preset will work better. Again, experimentation is the key.

Small and Accurate Changes in Time Duration

If you have a sound file that is one minute and three seconds long, but you need it to be exactly one minute, there are two ways to go about it. If a very small change in pitch is acceptable, you might try using the Pitch Shift with no Preserve duration. Keep the Semitones at 0 and adjust the Cents until the required Final length is reached. It is sometimes possible for this method to give better sounding results than when using the Time Compression algorithm.

Synthesis

Simple Synthesis

The Simple Synthesis tool can be used to generate a simple waveform of a given shape, pitch, and length. More complex waveforms can be generated with the FM Synthesis tool.

Create a new window by selecting the New item from the File menu and set the data format for the window to be 16-bit, 22,050 Hz, Mono. Next select Synthesis|Simple from the Tools menu.

Select the Middle C Reference (3 seconds) preset and press OK to generate a sine wave in the window that is 3 seconds long and has a pitch of 261.52 Hz (Middle C). Press the Play button to hear your reference tone.

FM Synthesis

Sound Forge's FM Synthesis tool allows you to use frequency modulation (FM) and additive synthesis to create complex sounds from simple waveforms.

In frequency modulation, the frequency of a waveform (the carrier) is modulated by the output of another waveform (the modulator) to create a new waveform. If the frequency of the modulator is low, the carrier will be slowly de-tuned over time. However, if the frequency of the modulator is high, the carrier will be modulated so fast that many additional frequencies, or sidebands, are created.

Sound Forge allows up to four waveforms (operators) to be generated in a variety of configurations. Depending on the configuration, an operator can be a carrier, a modulator, or a simple unmodulated waveform. Waveforms can also be added together (additive synthesis) to add more complexity to the sound.

The best way to become familiar with this module is to start with a single operator configuration and try out all the different waveforms by themselves. Experiment using Feedback on each waveform to hear the different effects of self-modulation. Feedback adds overtones to the sound by modulating the sound with itself. Zero feedback indicates simple synthesis.

In the second configuration, two unmodulated operators are mixed together (horizontal

connection) and heard simultaneously (additive synthesis).

Now change the Configuration to two stacked operators (vertical connection) and again experiment using different waveforms and frequencies on the carrier (bottom operator) and the modulator (top operator). With the modulator Frequency set low (1-5 Hz), lower the modulator Amplitude to create slight de-tuning. Raising it creates big pitch bends. If the modulator Frequency is set high, many unusual FM sounds can be achieved. Make sure that the modulator Amplitude is not too high, otherwise the result will be harsh, noise-like sounds.

Setting the modulator Frequency to 0.00 allows absolute control of the carrier's pitch by using the modulator's envelope, which you can use for de-tuning over time.

Adding more operators increases the complexity of the waveform. When both FM and additive synthesis are combined, an almost endless variety of sounds can be generated.

DTMF Synthesis

The DTMF Synthesis tool is used to generate the dial tones used by telephone companies. These dial tones correspond to the numbers in a telephone unit, along with other special codes.

For example, select the Sonic Foundry, Inc. preset. The dial string shows Sonic Foundry's phone number. The Amplitude control determines how loud the tones will be. Press OK to generate the tones. Now when you play back the sound file, you'll hear the tones which when played over a phone line would trigger a call to Sonic Foundry.

Filtering Intro

What can you do when you have a sound that is not quite perfect, but not bad enough to throw away? Sometimes, judicious use of filtering can keep a favorite sound bite from losing favor. Filtering is not a cure-all for bad sound, but slight alterations of a sound can bring it back to life.

Sounds are composed of varying amounts of one or more frequencies. For example, a sound with a rich timbre will contain many different frequencies. A sine wave sound has only one frequency in it, like 60 or 440 Hz.

Filters allow the tailoring of the frequency spectrum of a sound. A spectrum is nothing more than a representation of how much of each frequency component (from 20 Hz up to one-half the sample rate) is present in a signal. Less of any given component means that the given frequency component is not as prevalent aurally as another component. Filters pass or reduce (attenuate) frequency components.

Many factors such as the frequency response characteristic of your speakers and sound card can also affect which frequencies are more prominent during the playback of a sound. In general, the goal is to make a recording sound as close to the original as possible. However, filtering is also commonly used to remove unwanted sounds such as noise, or make individual instruments in a recording sound louder.

Paragraphic EQ

The Paragraphic EQ is a set of six very flexible parametric filters. Four independent band filters allow you to boost or attenuate specific frequency ranges. Also, two shelving filters let you control the amount of low and high frequencies in your recordings. A Gain vs. Frequency graph shows the overall effect of the combined filters, making it easier to visualize the final sound.

Open TUTMUSIC.WAV and select EQ|Paragraphic from the Process menu. Next, select the 15 dB notch centered at 1000 Hz preset. Notice how the graph goes below the centerline at 1000 Hz.

Hit Preview and listen to the very strange, hollow sound caused by the missing mid-range

frequencies. Moving the Gain fader of the third filter further down from -15 dB to -25 dB will increase the effect. Next, move the fader - 25 dB to +9 dB and listen to the drastic tone difference.

Double-clicking on a band's Gain fader resets its value to 0 dB, which disables the band. To disable all bands,right-click on an unused portion of the dialog and select Reset All from the shortcut menu.

Each of the four bands has a Center frequency, Gain, and Width control. The Width control determines how may octaves above and below the center frequency will be affected by the filtering. For the most part, try to keep the width around one octave. If the width is small, fewer frequencies will be affected.

Select the Boost bass frequencies below 250 Hz by 4 dB preset and hit Preview. Here, the low-shelf filter is used to make low frequencies louder. Change the gain from +4 to -15 dB and check out how most of the bass has been drastically reduced, as if being played through a small radio.

Open the file CREEK.WAV. This file contains a recording of a small stream. If you look at the waveform, you'll notice that there are some very high level, low frequency waves in this recording, probably caused by the wind. They are inaudible, yet if you look at your speaker's woofers during playback, you'll see them bouncing up and down. This large excursion can damage some speakers and forces both the amplifier and woofer to work overtime. Woof!

To remove these frequencies, go to the EQ|Paragraphic dialog and select the preset titled Remove very low and inaudible frequencies below 20 Hz. Now hit Preview. Turning the Bypass check box on and off, you should notice no audible difference. Hit OK. Notice how the large waves are gone and your woofers are no longer crying for help.

Removing very low and inaudible frequencies after recording is a very good idea. For one, your waveform will lookmore natural and the level meters more accurate. Also, edits and effects will behave more predictably, giving youextra headroom.

Parametric EQ

Sound Forge has four basic types of parametric Filter styles: High-pass, Low-pass, Band-pass (peak), and Band-reject (notch). A low-pass filter alters frequencies above a certain value, and a high-pass filter alters frequencies below a certain value. A band-pass filter alters frequencies outside of a specified range. A band-reject (or notch filter) alters frequencies inside a specified range. Generally, each filter attenuates frequencies in its stopband range(s) and leaves frequencies in its passband range alone.

The rate at which the passband transitions into the stopband is the transition band (or rolloff). When you specify the characteristics of a filter in Sound Forge, you will no doubt be tempted to specify that a low-pass filter will start to transition at, say, 1,000 Hz and finish transitioning by 1,001 Hz. The problem with doing so is that there are mathematical limitations to creating such a filter. When you specify a sharp transition band, the software will try to design a filter that will take a long time to apply and will unnecessarily filter the signal to overly exacting requirements. Razor-sharp filtering can often create unwanted side-effects. The more subtly you filter a signal, the more natural it sounds.

When specifying the attenuation amount for your filter, you are selecting how much to de-emphasize the frequency components that you do not want to hear. Numbers that are more negative suppress the frequency components more heavily. In other words, -6 dB of stopband rejection is going to let more unwanted frequencies through than -15 dB will.

So, let's say you just recorded a great hamster sneeze, but there is something not quite right about it when you play it back later. What can you do to restore the hamster sneeze to its rightful place as your favorite sound in your Windows environment?

Maybe you used a microphone preamp with bad common-mode rejection characteristics, or you set the hamster right next to a lamp when you recorded the sneeze? Well, don't panic, because Sound Forge can fix that sound. Try applying a 60 Hz notch filter to the sound. A notch filter will notch-out the frequencies in a range about 60 Hz so that they are not as readily heard relative to other frequencies.

Maybe the hamster sneeze has too much hiss in it? Try applying a low-pass filter and see if that makes it better. Remember, a small amount of filtering goes a long way.

Open TUTMUSIC.WAV and select EQ|Parametric from the Process menu.

Select the Phone-line effect preset and press OK to run the filter. Press the Play button to hear how the music is much thinner sounding, quite like hearing it over the phone. The Band-pass filter has attenuated frequencies below 250 and above 7000 Hz.

Anexo C)

Manual de operación de "Cool Edit"

Cool Edit Quick Reference

Navigating Cool Edit

Commonly used functions are represented as icons in the Toolbar.
- Just holding the mouse over any of these icons will bring up a Quick Help message describing the function in more detail.

Waveforms are displayed in green.
- Any portion may be selected by clicking on the waveform, and dragging left or right.
- Holding the **SHIFT** key while doing so will increase the currently selected portion.
- **Double-Clicking** on the waveform will select the entire visible wave.

Choose **Zoom In** to expand the selected portion to full width. **Zoom Out** will give a larger view of the waveform, while **Full View** will display the entire waveform in the workspace.

The **Play** button will play the portion of the wave that is currently being viewed, or the portion that is highlighted.
The **Pause** button will temporarily pause the playback or recording of audio. The button turns into a **Continue** button when audio is paused. If recording, the red record bar turns yellow to indicate a paused state.
The **Record** button will start recording at the current insertion point. Any waveform data after that will be recorded over.
Use the **Stop** button to end waveform playback or recording.

The **Record Level Meter** below the Play/Record buttons will display in real-time the current peak amplitude of the audio being monitored, recorded, or played.
- **Double-Clicking** on the Record Level Meter will start and stop monitoring.
- **Right-Clicking** the display will bring up the Level Meter configuration menu.

The View Indicator depicts which portion of the entire waveform is being viewed in the workspace below.
- **Sliding** the green bar (when present) left or right scrolls various parts of the waveform below into view accordingly.
- **Clicking** to the left or right of the green bar will scroll the audio to the left or right one screen when zoomed.
- **Double-Clicking** on the View Indicator will bring up a Quick View screen to allow direct entry of starting and ending samples for the viewing range.

The **Yellow Arrows** indicate the point of insertion. Clicking anywhere in the workspace will move the point of insertion to the mouse.
The **Red Arrows**, when present, represent the Cue List entries for a cue marker.
The **Blue Brackets**, when present, represent the Cue List entries for a selection range.

The **Time Display** windows show the current Starting and Ending points of the current selection, or portion being viewed.
- **Double-Clicking** on these windows will toggle the display between time in seconds, and in samples.

The **Wave Format** window displays the format of the wave in Channels, Sample Rate, and Bits Per Sample.
- **Double-Clicking** on this window will bring up the Adjust Sample Rate dialog to change the waveform's characteristics.

The waveform **Ruler** shows the time at any point in the waveform.
- **Double-Clicking** on the ruler will change the displayed time format.

When a wave is being played via the **Play** button, or automatically via a keypress (see Cue List) a vertical bar shows the current playing position.

If a valid audio CD is in the CD-ROM drive, and the [MCI] CD Audio extensions are loaded, pressing the CD icon will display the CD Player Controls at the bottom of the window.

The **View Indicator** is the green bar above the waveform being viewed which changes size depending on the level of Zoom.

Se despliega en la pantalla la última parte del archivo y el cursor se coloca al principio de la última línea.

% **vi** +*n nombre_archivo*
El cursor se coloca al principio de la línea *n* del archivo, dónde *n* es un número entero no mayor al número total de líneas del archivo.

Modos de trabajo del editor vi

El editor vi tiene dos modos de trabajo: el *modo de comandos* y el *modo de inserción*. Al comenzar una sesión, vi se encuentra por omisión en el modo de comandos, esto es, en espera de la ejecución de algún comando. Para conmutar entre ambos modos se usa la tecla <ESC>.

Órdenes básicas

Inserción de texto

a *Insertar texto a la derecha del cursor*
i *Insertar texto a la izquierda del cursor*
I *Insertar texto al principio de la línea*
A *Insertar texto al final de la línea*
o *Inserta una línea abajo de la línea actual*
O *Inserta una línea arriba de la línea actual*

Movimiento en el texto

j	*Mueve el cursor una línea abajo*
k	*Mueve el cursor una línea arriba*
h	*Mueve el cursor un caracter a la izquierda*
l	*Mueve el cursor un caracter a la derecha*
<CTRL><F>	*Mueve el texto una página hacia adelante*
<CTRL><B>	*Mueve el texto una página hacia atrás*
1G	*Mueve el cursor al inicio de la primera línea del archivo*
G ó **:$<ENTER>**	*Mueve el cursor al inicio de la última línea del archivo*
:n<ENTER>	*Mueve el cursor al inicio de la línea* ***n***
w	*Va a la siguiente palabra*
e	*Va al final de la siguiente palabra*
b	*Va a l inicio de la siguiente palabra*
M	*Va a la mitad de la pantalla*
<SHIFT>j	*Une la línea actual con la línea de abajo*

Búsqueda y reemplazo de caracteres y cadenas

*/cadena_buscada***<ENTER>**	*Busca la cadena hacia adelante*
:/*cadena_buscada***<ENTER>**	*Busca la cadena hacia adelante*
?*cadena_buscada***<ENTER>**	*Busca la cadena hacia atrás*
:?*cadena_buscada***<ENTER>**	*Busca la cadena hacia atrás*
:s/*cadena_actual***/***nueva_cadena***/g**	*Reemplaza* ***cadena_actual*** *por* ***cadena_nueva*** *sólo en la*

Viewing Range

Selecting **Edit -> Viewing Range** or double-clicking on the green/black samples portion bar will bring up the viewing range window.

Enter the leftmost and rightmost samples that you wish to have displayed. Use this function to highlight a specific number of samples by double-clicking in the wave editing area after selecting the viewing range to "select all". Remember, Select All only selects the viewing range, not the entire waveform.

Cue List

A cue list is a list of time offsets into the wave file. A cue can be either a point, specifying a cursor position, or a range, specifying a selection. You can easily jump to a cue position in a wave by double-clicking on the position in the list, or selecting the cue position, and pressing Goto. Cue ranges can later be arranged in a play list to be played back in any order, with a specific number of loops if desired. A maximum of 96 cues may be entered.

<- Add
Add the currently highlighted selection, or cursor position to the cue list. Items will be displayed in temporal order, with the earliest cue position at the top of the list. Pressing F8 when editing a waveform will add the current range or cursor location to the cue list.

Remove
Remove the selected cue position from the list.

Label
Short text label describing the selection.

Description
A textual description of the wave data if necessary. Also can be used as a comment.

Goto
Goto the selected cue position, or highlight the selected range. Double clicking a cue item acts as if Goto were pressed for that item.

The cue list is saved in the .WAV file format in the 'cue ' chunk. Additional information about the cue position, like label, description, and length of sample, are placed in the 'adtl' list in the 'labl', 'note', and 'ltxt' chunks.

Merge
Merge will create a cue range that spans the two cue items selected (whether they are ranges or markers themselves). To select more than one cue item in the list, hold down on the CTRL key when selecting, or click and drag over more than one cue item. The name used for the new merged item will be the same as the earliest item chosen in time (the highest item in the list). The information typed into the Name and Description fields for the second item being merged will be lost.

Markers
The cue list can be used anytime to mark your current selection so you can return to it later. If you would like Cool Edit to remember your highlighted selection, or just your current cursor point, click Add in the cue list, and quickly type a name for your selection. In the future, if you want to return the cursor to that point, or re-highlight that selection, double-click the name or choose the name and click Goto. One great use for markers is to highlight a wave from the zero crossings. Go to the start of wave portion you wish to highlight, and zoom in as far as needed to position the cursor exactly on the zero-crossing point. Add that position to the cue list. Now zoom out, go to the end of the wave portion, and once again zoom in to find the ending zero crossing. Now, double-click on marker name in the cue list, hold down on the Shift key to extend the selection, and click on the ending zero crossing. Voila! You can choose "Zoom In" now to see your wave portion if you like... it is now selected.

Visual Representations
Cue markers will be displayed in the main waveform as red arrows above and below the wave. Cue ranges will be displayed as blue brackets above and below the waveform.
Assigning Cue Ranges To Keys

If you wish to assign any cue range you have added to a key on the keyboard, give the cue range a label of the form **KEY N**, where **N** is any key on the keyboard (capital letters only). When you go back to editing the waveform, pressing the key will play the cue range you selected. You can assign any portion of the waveform to any key on the keyboard. If you have any problems when playing audio by pressing the assigned keys, try increasing the STACKS line in CONFIG.SYS to read STACKS=12,512.

Shortcuts

KEYBOARD

Delete	Delete
CTRL+C	Copy
CTRL+Insert	Copy
CTRL+X	Cut
SHIFT+Delete	Cut
CTRL+V	Paste
SHIFT+Insert	Paste
CTRL+T	Trim
ALT+Bksp	Undo
CTRL+A	Select Entire Wave
CTRL+S	Select currently viewed portion
ESC	Cancel selection
CTRL+L	Edit left channel
CTRL+R	Edit right channel
CTRL+B	Edit both channels
ALT+P	Play waveform
ALT+S	Stop play
SPACE	Play waveform/Stop waveform
F2	Repeat last command (show dialog if command has one)
F3	Repeat last command ***now*** (using last used settings)
F4	Zero cross adjust
F8	Add the current cursor location or highlighted selection to the cue list
ALT+I	Waveform Info
ALT+Z	Frequency Analysis Window

MOUSE

Left Click and Drag on waveform to highlight and select a range of samples
Click and drag near the top or bottom of a stereo wavform to select a single channel
Right Click (and drag) on waveform to extend selection
Shift+Left Click (and drag) on waveform also to extend selection
Double-Click on view indicator (green bar) to enter viewing range directly in samples
Click to the left or right of the view indicator to page one screen left or right
Double-Click on Levels Meter (black bar beneath play buttons) to start/stop monitoring
Click on the Clip Indicator (to the right of the level meter) to clear it
Right Click on the level meter to bring up its configuration menu
Double-Click on Sample type display to change sample type interpretation
Double-Click on the waveform ruler to change the ruler format.
Double-Click on time windows to change time format
Double-Click on title bar to Maximize/Restore
Rest mouse over toolbar button to get explanation of button's function

File menu

The file menu displays file handling options.

File Menu Options:

- **New**
- **New Instance**
- **Open**
- **Open As...**
- **Open Append...**
- **Re-Open**
- **Close**
- **Save**
- **Save As**
- **Save Selection**
- **Exit**

Level Meters

Level Meters from the **Options** menu will start monitoring the recording source, which is useful for setting the recording levels before recording. To stop monitoring, press the **Stop** console button. The meter may also be started and stopped by double-clicking on the meter display area. If your audio system software crashes when doing this, try increasing the STACKS in CONFIG.SYS to STACKS=12,512, or the equivalent for Windows 95.

The levels displayed represent the peak amplitude in decibels, where a level of 0dB is the absolute maximum before clipping occurs. If clipping does occur, the clip indicator to to the right of the meter will light up. Just click on the clipping indicator to clear it at any time. When displaying stereo audio, the to meter represents the left channel, and the bottom the right. Yellow peak indicators will *stick* for 1-1/2 seconds to easily read the peak amplitude. If the option to Adjust for DC offset is enabled, false clip reading may occur since the baseline is being adjusted. Disable the DC offset adjustment to have the clip indicators only light up when absolute clipping occurs.

Clicking the Right Mouse Button on the level meter display will bring up a configuration menu. From the configuration menu, you may do the following:

Start/Stop Meter
Start or Stop monitoring of the input source. When monitoring is active, the meters will respond directly to the audio input.

Clear Clip Indicators
The box(es) at the right will light up red if audio is clipping. Click on the box or choose this option to reset the indicator. It is best to record audio as loud as possible without clipping. It is sometimes easier to keep the loudest point somewhere between -2dB and 0dB when setting the recording levels on your sound board's mixer. Note: The clip indicators will always light if clipping occurs, but if Adjust for DC is enabled, the indicators may light up when the audio has a DC offset.

Adjust for DC
Many sound boards record audio with a slight DC offset, which means that the center of the waveform being recorded is not at the exact center of the waveform display, but a little above or below it. This can dramatically throw the level meters off since the amount the waveform is displaced could be interepreted as a constant sound that loud. To compensate, make sure this menu item is checked. The recording meters will dynamically adjust to the DC offset, and display the true amplitude of the signal in decibels.

Show Valleys
Just as the yellow indicators show peak levels, if Show Valleys is chosen, valley levels (minimum amplitudes) will be marked as well. This gives a good indication of the dynamic range of the audio. If the valley indicators are close to the peak indicators, the dynamic range is low. If they are spread far apart, the dynamic range is high (the difference between the quietest sounds and loudest sounds is greater).

90dB Range to 30dB Range
This is the range that the meter covers. When recording 8-bit audio, there is no need for anything greater than a 45dB range, since 8-bit audio can not really record anything below a volume level of -45dB. Use a lower range to see the loud portions more clearly. Use a higer range to see the quieter portions for very high dynamic range audio. Note: You may find that when you think your sound board is recording pure silence, you will see the meters fluctuating between points around -87dB up to -60dB instead of going all the way down. This is because of noise in the sound board. Some sound boards have higher signal-to-noise ratios than others. Generally, the higher quality the sound board, the lower the meters will go down during *pure* silence. To quickly see how noisy your own sound card is, choose File->New and create a new 44.1Khz 16-bit file. Then start the level meters, and choose the 90dB Range. This test only

works for 16-bit sound cards, since 8-bit sound cards have a maximum dynamic range of around 45dB.

Dynamic / Static Peaks

Choosing Dynamic Peaks will cause the yellow peak level indicators to reset to a new peak level after 1-1/2 seconds. In Static mode, the peaks never reset. Use Dynamic mode to easily see visually the peak amplitude *right now*. As audio gets quieter, the peak indicators will start backing off as well. Use Static mode to retain the maximum amplitude of the signal since monitoring, playing, or recording began. The peak can still be reset manually at any time by clearing the clip indicators (clicking on the clip indicator at the right). Static mode is great for finding out how loud a song will get before recording it. Just start the meters and start playing the song. When the song is over, the peak indicators will show how loud the loudest part of the song was.

RIFF Info

Extra information can be included in your .WAV files using the RIFF LIST INFO and DISP type 1 formats. This information should (depending on future wave editors) stay with your sound through its lifetime. Other wave editors should preserve some of the fields you see here. If the "Fill * Fields Automatically" box is checked, then the Software Package and Creation Date fields will be automatically filled by Cool Edit. If you do not want this extra information to be tagged with your wave files, uncheck this box. Be sure to put proper information in its place!

Display Title
This should describe the sound, or text (if there are words in the wave). This field should be as short as possible, since it will be displayed in OLE objects and the like.

Icon
Any DIB or BMP file can be inserted, but preferable a 32 X 32 16-color would be best. The Media browser uses this size to display a picture representing the sound. Other OLE compatible applications can use the above display title, and/or the bitmap to represent your waveform.

Original Artist
The one who created the sound initially. Examples are: Beatles, Pat Sejek, Fred Flintstone

Name
The title of the wave. This is your chance to put a name with your audio "artwork". Examples are: Thunderstorm At Night, Forest Stream

Genre
The Genre of the original work. With audio, let's try things like musical classifications, etc. Examples are: Cartoon Voice, New Age, Instrument

Key Words
In the future, sounds may be searched for by key words. Please separate key words by a semicolon followed by a space. For Example: Violin; Hayden; Johann Strauss

Digitization Source
Where was the sound digitized from. A tape deck, CD, or maybe directly from a microphone? Maybe describe the board used here too, like Sound Blaster Pro, or MediaVision. For Example: DDD CD to MediaVision Pro 16

Original Medium
Where did the sound come from originally. Examples: Live Band, Flute, Moog, Voice

Engineers
Store the name(s) of the engineer(s) who worked on the file, or edited the file. Please separate names by a semicolon and a space. When a new person edits the file, they can add their name to the list. For example: John Cravitz; Fred Millstone

Digitizer
Who is the technician that did the actual digitizing? They should put their name right here.

Comments
This is for making any comments you wish. Feel free to include any special effects or enhancements you made to any preexisting waves so that the editing history can be tracked. Please do not use any line returns. End each sentence with a period. For Example: It took 12 hours to get this recording right.

John added echoing effects using Cool Edit.

Subject
This Describes the content of the file. Feel free to include a description of the instruments used, where someone can find the song recorded, etc. Line returns are OK, and are created by pressing Ctrl+J. Sometimes copyright information is placed here as well. For Example: The shakuhachi of Japan.<Ctrl+J><Ctrl+J>The shakuhachi was developed in the 15th century from a Chinese end-blown flute, called the chiba.

Source Supplier
The name of the person, or organization who supplied the original source material. Let's use this field for the names of record companies, or whoever supplied you with the source. Examples: MCA Records, Ann Wilson (if recorded live)

Copyright
Any copyright information for this file should go here. Example: (c)1992 G. Willikers Corporation. All rights reserved.

Software Package
The software used to digitize and edit this file.

Creation Date
The date that the subject matter was created. The date should be in the format yyyy-mm-dd, using '0' as a place holder in single digit values. For example, if the date the original recording was made was July 30, 1988 then it would be written as: 1988-06-30

Frequency Analysis

This will bring up an analysis dialog, containing a graph of the frequencies present at the insertion point (yellow arrow cursor), or at the center of a selection. A 2048 point Fast-Fourier-Transform is performed to determine the frequencies present. Also, the most prominent frequency is interpolated, and displayed below. By moving the mouse over the graph area, the frequency, and amplitude of that frequency are displayed.

Clicking **Scan** will scan the highlighted selection, and show all frequencies present in that selection.

The information in this dialog is like one "slice" or line in the Spectral View of the waveform. For an *animated* view of the display, click on the main waveform window, then hold down on the Right Arrow key. As the cursor scrolls across the display, the spectral information will be displayed in the analysis window.

To gain higher resolution and see more detail in the lower frequencies, use Convert Sample Type to downsample the waveform to a lower sample rate. The highest frequency value displayed will be one half the new sample rate.

If stereo data is being viewed, the left channel will be shown in Cyan while the right will show in Magenta.

Check the **Line View** box to connect the dots at each frequency.

Cue List

A cue list is a list of time offsets into the wave file. A cue can be either a point, specifying a cursor position, or a range, specifying a selection. You can easily jump to a cue position in a wave by double-clicking on the position in the list, or selecting the cue position, and pressing Goto. Cue ranges can later be arranged in a play list to be played back in any order, with a specific number of loops if desired. A maximum of 96 cues may be entered.

<- Add
Add the currently highlighted selection, or cursor position to the cue list. Items will be displayed in temporal order, with the earliest cue position at the top of the list. Pressing F8 when editing a waveform will add the current range or cursor location to the cue list.

Remove
Remove the selected cue position from the list.

Label
Short text label describing the selection.

Description
A textual description of the wave data if necessary. Also can be used as a comment.

Goto
Goto the selected cue position, or highlight the selected range. Double clicking a cue item acts as if Goto were pressed for that item.

The cue list is saved in the .WAV file format in the 'cue ' chunk. Additional information about the cue position, like label, description, and length of sample, are placed in the 'adtl' list in the 'labl', 'note', and 'ltxt' chunks.

Merge
Merge will create a cue range that spans the two cue items selected (whether they are ranges or markers themselves). To select more than one cue item in the list, hold down on the CTRL key when selecting, or click and drag over more than one cue item. The name used for the new merged item will be the same as the earliest item chosen in time (the highest item in the list). The information typed into the Name and Description fields for the second item being merged will be lost.

Markers
The cue list can be used anytime to mark your current selection so you can return to it later. If you would like Cool Edit to remember your highlighted selection, or just your current cursor point, click Add in the cue list, and quickly type a name for your selection. In the future, if you want to return the cursor to that point, or re-highlight that selection, double-click the name or choose the name and click Goto. One great use for markers is to highlight a wave from the zero crossings. Go to the start of wave portion you wish to highlight, and zoom in as far as needed to position the cursor exactly on the zero-crossing point. Add that position to the cue list. Now zoom out, go to the end of the wave portion, and once again zoom in to find the ending zero crossing. Now, double-click on marker name in the cue list, hold down on the Shift key to extend the selection, and click on the ending zero crossing. Voila! You can choose "Zoom In" now to see your wave portion if you like... it is now selected.

Visual Representations
Cue markers will be displayed in the main waveform as red arrows above and below the wave. Cue ranges will be displayed as blue brackets above and below the waveform.
Assigning Cue Ranges To Keys

If you wish to assign any cue range you have added to a key on the keyboard, give the cue range a label of the form **KEY N**, where **N** is any key on the keyboard (capital letters only). When you go back to editing the waveform, pressing the key will play the cue range you selected. You can assign any portion of the waveform to any key on the keyboard. If you have any problems when playing audio by pressing the assigned keys, try increasing the STACKS line in CONFIG.SYS to read STACKS=12,512.

Play List

The play list is a listing of cue ranges that can be played in any order, and looped a specified number of times. The play list is used in conjunction with the cue list. Maximum size of a play list is 64 entries.

<- Add Before
Add the currently highlighted selection from the cue list to the play list. The selection is inserted before the currently highlighted play list item, or at the end if nothing is selected.

Remove
Remove the selected play list item from the list.

Loops
The number of loops to loop the selected cue range in the play list.

Play
Play the cue ranges in the order listed, looping selections if necessary. Play begins at the currently highlighted item in the play list, or the entire list is played if [end] is selected, or there is no selection.

Autocue
Play the currently highlighted item in the play list (or the first item if nothing is highlighted), looping if necessary, and stop on the next item in the play list. Thus, every time **Autocue** is pressed, the next item in the play list is played.

The play list is saved in the .WAV file format in the 'plst' chunk

Cool Scripts

Scripts are similar to Macros. Your exact mouse moves, and tweaking of parameters is not stored, only the final result when you click "OK". Undoing something is recorded into the script, since you may have copied something, then undid it, which can be a very useful technique.

Multiple scripts can be kept in one script file, and identified by name. At any time, you can edit the script file directly to take out steps, rename scripts, remove unwanted scripts, etc.

There are various types of scripts, which depend on when you initiated the recording:
- Scripts that start with File->New, and always start with a blank, empty waveform.
- Scripts that start when a waveform is opened, and work at the current sample rate, etc. Actions begin at the insertion point in the waveform, and may affect any part of the entire wave if present.
- Scripts that start with a highlighted waveform portion. All actions in the script pertain only to the portion that is highlighted, leaving the rest of the waveform untouched.

Scripts that run during all of the above conditions will be displayed, but only the ones recorded under the same circumstances will be allowed to run. In other words, if a script recording started when a portion of a wave was highlighted, then you will only be able to run that Script when something is highlighted.

Scripts are very useful for remembering how you generated a particular sound effect. Use the script to reproduce the sound effect without having to save the entire waveform. This is especially useful when generating large brainwave "theta" files, which can take monstrous amounts of space. By generating the file once, with the scripting turned on (record), you can generate the file again at any time in the future, and save all that hard drive space. You can also pass along scripts to your friends across email or BBS systems, since they take nearly no memory to store.

When running a script, you can either stop at each dialog box, or have the script automatically run through completion by using the "Stop at Dialogs" checkbox. Stopping at each dialog box is handy if you wish to 'tweak' the parameters while the script is running.

After recording a script, you may enter a description at the bottom of the dialog to go with the script you just recorded. This description will appear when the user of the script highlights the script to run. Note: the only time you can edit the description is after recording, not before, and not after it has been added to a script collection file. But, you can still edit the description at any time by pressing the **Edit** button to edit the text file directly.

A single script can be run on a batch of files by pressing the **Batch Run** button. For more information, see Batch Processing.

Pause at Dialogs - At each dialog, the script will stop to allow you to modify the values to the function. Pressing Cancel at this point will stop the script, pressing OK will continue it.
Alert when complete - When the script is finished, a dialog box will signal the completion of the script if this option is checked.
Execute Relative to Cursor - When running a script that was recorded when a waveform was loaded but there was no highlight, it can be run by playing back all the operations relative to the beginning of the file or to the beginning of the cursor. For example, the Sound Effects scripts require you open a waveform (it can be blank) first. Checking this option will insert the effect at the cursor, otherwise the effect will be inserted at the start of the file.

Important Note: Other buttons and functions are not disabled while the script is running. Therefore, do not use the other functions until the script has stopped playing.

FXNS2.SCP Sample Collection

Description These are five sample functions. Cross Fading is useful if you are going to loop the sample. The last portion of the sample is overlapped with the first portion, and the amount of overlap is different for each Cross Fade script. Full cross fading fades the last half of the sample with the first half. Soft cross fading fades the last 5% with the first 5%, and hard cross fading fades the first 0.4% with the last 0.4%. Make Piano Keys will take the highlighted sample and stretch and compress them to vary the pitch, making 13 copies of the original, each at a different pitch. Each pitch is assigned to a key on the keyboard through the cue list. This turns your keyboard into a simple sample player. Reverse Echo is just that -- the echo function, but the echoes go in reverse.

How To Use These sample functions work on a highlighted selection. Open a waveform, and highlight the portion you wish to operate on, then run the script.

SNDEFX2.SCP Sample Collection

Description Here are some nifty sound effects, and a small song (very small). If you run the Cool Song script, you can then go to the Music function, and enter a name for the song to save it under. This script generates a short note, and then uses the Music function to build the song. The other four effects are just weird effects using the tones or noise functions with other transformations. If you've watched "Dr. Who", you may recognize the Cool Lasers sound effect.

How To Use These sound effects work in a currently opened waveform. Open a New (blank) waveform in any sample rate setting you desire for the quality you would like, and run a script. These sound effects can also be inserted into an existing waveform, and will be inserted just as if the Paste command were used.

MINDSNC2.SCP Sample Collection

Description Included are four "Tones" synchronization scripts, which have a binaural beat pattern (two differing tones in each ear) overlaid with the corresponding "Waved" pink noise. Choose Loop Play and listen to the audio as long as you like. Each Tone script stimulates a different brainwave frequency, from Delta to Theta to Alpha, and an "Earth" tone of 7.83Hz. The "Music" scripts have "Waved" music overlaid with the pink noise for a relaxing effect. The Creativity Theta Session is similar to the sample theta session described with the Wave function, and lasts 1/2 hour. The session starts at Alpha, goes down to Theta, and stays there with a few bursts into Alpha and back.

How To Use Open a new blank waveform of any Stereo sample setting you wish. We suggest using at minimum 22 KHz 16-bit stereo, but the synchronization effects will still work at lower sample rates and 8-bit. Once you have a blank waveform to work with, run one of the scripts.

Select Wave Device

If you have multiple sound cards, or multiple output devices (such as a sound card *and* the PC speaker), choose the input and output devices you wish to use.

If your system is equipped with MIDI devices, you may also choose the MIDI in, and MIDI out sources.

The capabilities of the recording and playback devices are displayed in the given tables.

The settings are remembered in the [cool edit] section of your WIN.INI, which means if you install a new sound driver or card, Cool will not access it until you choose it from this dialog.

Customizable Toolbar

The toolbar can be arranged in any order by changing button ordering in the listing shown in the dialog box. More than one item may be highlighted at a time and moved up or down the list. Items at the top of the list will appear at the left of the toolbar. Press the *Zap* button (looks like a lightening bolt) to move the highlighted button(s) to the end of the list. Put all your most used functions near the top, and zap all the functions that you never use!

Check **Enable Toolbar Help** to have the help balloons appear when you hold the mouse over a toolbar button.

The File Save icon can be interpreted as a Save As or a Save Now (without any dialog asking for a filename if the file is already named) by making the appropriate choice after **File Save**.

Internal to the COOL.INI file, the toolbar format is slightly different than with previous versions of Cool Edit. Your previous settings should have been retained as closely as possible, but because the older version assigned priorities to the buttons (so buttons in the middle did not display until the window was wide enough), new buttons might appear. Just zap the buttons you do not use.

Settings

GENERAL

Disk Icon Interpretation
The Disk icon can be interpreted as:
- Save Now (saves what you are working on under the same filename seen in the title bar without asking if you wish to overwrite the original) or
- Save As (Always brings up the Save As dialog box to enter the title to save the file as)

Enable Toolbar Help
When the mouse is over a toolbar button for more than a few hundred milliseconds, a small help box appears to describe the button's function. Anyway, if it is annoying for you, you can turn it off here.

Viewing Mode
When zoomed in closely to a wave, individual samples can appear as dots, or as a continuous line.

Highlight After Paste
After doing any Paste operation (this includes Paste Special), you can have the inserted selection automatically highlighted, or just have the cursor at the end of the pasted selection. Not highlighting after pasting makes it easier to do multiple pastes one after the other.

Use old style file open/save dialogs
If checked, the File Open and File Save dialogs will be similar to those for 16-bit Windows applications, instead of the new Explorer style. You may want to use these dialogs if you are used to them and don't need the extra features of Explorer dialogs such as New Folder, Delete, Move, List View with file sizes and dates, etc. One advantage to the older style is that directories are listed separate from files.

Maximum Display on Load
This is the maximum number of seconds of audio to display when a file is first loaded. When working with large files, you may wish to limit the initial display area to 10 or 20 seconds so you don't have to wait for the entire waveform to draw. Setting this value to zero means there is no limit on the initial display size.

Custom Time Code Display
Double-clicking on the time boxes or waveform ruler will change their display format. When in the custom Hours:Minutes:Seconds:Frames format, you can customize the number of frames per second that will be displayed. Some common settings are 30 (for SMPTE non-drop), 25 and 50 for PAL, and 75 for CD-ROM mastering.

SYSTEM

Total Buffer Size
The number of seconds to reserve memory for recording and playback. Increasing this will allow more multitasking while audio is being played, but it takes more memory. If this value is too small, there may be too much choppiness in your recordings and playbacks. If your recordings are getting all "chopped up", or you cannot Stop after you've started recording, increase the buffer size, or switch to a faster hard drive (Use a non-compressed hard drive for example).

Number of Buffers Using
The number of buffers may affect recording quality in that some audio drivers may not be able to handle a large number of buffers accurately. If you experience any stuttering or missing (chopped out) audio, try reducing the number of buffers. Also experiment with the total buffer size, as reducing the number of

buffers will increase the size of each buffer, since the total of all buffers will be roughly equaly to the time specified by the Total Buffer Size setting.

Temp Directory
This is the location that Cool Edit will use to save all of the temporary files, which includes the disk image of the file currently being edited. It is best to choose a large, fast hard drive for this. If you know for certain that the drive is *not* compressed, then do not check the **Compressed** box, otherwise check this box. If you have trouble recording high quality audio for more than a minute (or even less), then make sure the Compressed Drive box is not checked. When checked, DOS is asked for the number of bytes remaining on the hard drive since this value does not change linearly with time on compressed drives.

Undo Directory
This is the location that Cool Edit will use to save all the Undo files. Any number of undo **levels** can also be chosen. This directory can be different that that of the Temp Directory. It makes no difference whether the drive use for Undo is compressed or not - but a non-compressed drive will be faster.

Enable Undo
If this is checked, the undo function is enabled and running. After making a change, you can choose **Edit -> Undo** to back up one step. You may want to disable the undo feature if you know you are not going to undo something. For example, if you are running a function on a 5 minute file, you may not want to wait while the undo information is saved.

Play 16-bit files as 8-bit
If your sound board is only capable of 8-bit audio, you can still create and edit 16-bit audio files. When you choose Play, the audio data will be converted to 8-bit before being sent to the sound board.

Smooth 16-bit to 8-bit Conversions
If checked, when 16-bit audio is pasted into an 8-bit waveform, or 16-bit audio is Opened As 8-bit, the 16-bit audio is dithered down to 8-bit to retain more of the original signal. Dithering can keep some of the audio audible that is below the threshold for 8-bit audio. When doing this, you may notice a bit more noise in the background, but the noise is constant, and you can hear some of the 16-bit audio in the noise that was otherwise inaudible. If this dithering is not done, you will notice strange artifacts in quiet audio. Most prefer to have a constant background noise rather than have strange sounding artifacts in the background. Distortion sounds "crackly" if no dithering is used, or else the sounds have a constant hiss if dithering *is* used.

Play from cursor
When no selection is highlighted, audio can be either played from the current cursor location to the end of the view, or always from the left edge of the view to the end of the view.

COLORS

Waveform Color and **Background Color**
The waveform and background colors can be chosen to customize the color of the *green* waveform display.

Spectral High Energy and **Spectral Low Energy**
These settings are used in the spectral view. The high energy color is used for the loudest sounds, and low energy for the quietest. The colors will span the color cube from the highest down to the lowest in pretty much a straight line

Reverse Spectral Color Direction
To have the colors follow a path that wraps around the cube (instead of going in the straight line) check this box. This gives a very high degree of control over the spectral plots.

Default Colors
When all the colors are in too much disarray, press Default Colors to get back to the regular Cool Edit color settings.

SPECTRAL

Spectrum Analyzer Resolution
This is the number of bits of accuracy to display the spectral analysis when Edit->Spectral View is chosen. Each bit will take approximately twice as long to draw, but the resolution will be more precise. The number of data points displayed is equal to 1/2 of two to the value given. In other words, a value of 7 will display 64 points along the y axis, a value of 8 will display 128, 9 for 256, 10 for 512 and so on. On most displays, a value of 10 is as high as you will ever need to go.

Spectral View Window Function
This is the function that will be used to window the data before being displayed. In general, just keep this at Blackmann or Blackmann-Harris. The windows are listed in order from those with the narrowest frequency band but most noise, to those with the widest frequency band, but least extra noise.

Energy Plot
Choose **Logarithmic** to see every nuance of the audio. The color chosen will be based on the decibel amplitude of the energy present at the particular time and frequency. The quietest signals will be displayed in some color. Choose **Linear** to color the display based on absolute amplitude percentage. Linear is sometimes useful to see the general overview of a signal without getting bogged down by detail at much quieter levels.

Version History

95

Cool Edit has switched to using the 32-bit APIs, and compiled for 32-bit Windows to run on Windows 95 or later and NT 3.51 or later. Most functions have increased in speed by 50% to over 3 times as fast by going to 32-bit and doing more optimizing.
Added the new *Explorer* style dialogs for most File Open and Save dialogs. The *Explorer* dialog style allows one to copy, rename, delete, and move files as well as simply open or save them.
Added option to use old style file open dialogs for those of you who do not wish to use the new *Explorer* style dialogs.
Many minor bug fixes that have increased the quality and stability of Cool Edit.
Auto-play in the File Open dialog will now play all formats recognized by Cool Edit, not just .WAV files.
Fixed bug in saving and recalling Quick Filter presets.
Hitting Cancel on "Not enough memory for undo" inadvertently disabled all previous undos.
Added custom toolbar configuration dialog under Options. Also added some new toolbar items for other common operations.
Added Display Time Format menu under Edit.
Save Selection works while saving a portion of one channel of a stereo waveform.
Revised Settings dialog, and added special settings for color selection and spectral view.
Spent an extra couple weeks updating Cool Edit's copy protection to keep the program from being 'cracked' and hacked into.

1.52

Sample rate conversion quality has improved even more.
Users of the Lite version of Cool Edit now have access to the new high quality sample rate conversion.
Added Amiga IFF file format.
Some glitches in working with scripts have been eliminated.
CD titles are automatically read from the Windows 95 CDPLAYER.INI file.
File Open and File Save As dialog boxes remember nonstandard filename extensions, and remember last used Options settings for each format.
If no selection is made before performing a Transform operation, the current view is used.
A new ruler has been added to the waveform display.
Frequency Analysis display has been improved with decibel calibration and solid line view for more accuracy.
Spectral View has been improved by increasing the dynamic range of the display. Even the faintest signals are now plotted.
Waves play automatically if loaded from the command line.
Left and Right channels can be chosen individually by clicking near the top or bottom of the waveform display.
When loop playing, the looping will change to match the portion being selected.
Added option to control the number of play/record buffers for fine tuning recording quality.
Batch file processing now handles about 5,000 files per batch (up from a previous limit of about 200).
Faster sample rate conversion.
Faster Filter function in "locked" mode when not dynamically changing filter over time.
Faster Echo Chamber function by 5 to 20 times or more depending on room configurations.

1.51

Added A-Law, mu-Law, byte-reversed, and unsigned formats to the PCM raw data format. Also added optional header (.DAT) files for specifying format information for raw data.
Added support for Microsoft ACM (Audio Compression Manager) file formats.
Added a 5-bit IMA ADPCM compression for a higher quality ADPCM taking only 25% more space.
Rebuilt level meters: Display is logarithmic (and labeled) in decibels (dB); Right-mouse-button configuration menu; Clipping indicators; Peak meters easier to see; Meter displays while Playing and

Recording as well; Meter spans the entire width of the window for arbitrary precision.
Added user defined undo levels (maximum is 32 levels of undo).
Fixed 'memory hog' characteristic of Reverb function.
Quick Help no longer disables the Alt key.
Undo Music was corrupt, it's fixed now.
Drive letter only (e.g. "D:\") undo directory now works fine - it was causing a 'not enough memory for undo' message erroneously. Also fixed problem when temporary directory specified for a non-existent drive.
Space bar start/stop playing disabled when monitoring audio.
Destination directory always set properly in batch processing, even if the directory is directly typed in instead of using the browse button.
Added Zero Crossing function to adjust cursor position or highlight to zero crossings. Use F4 to quickly snap to zero crossing.
Functions will work on entire waveform if no highlight is made.
Moved location of 'fact' chunk in .WAV files to before the data instead of after to be compatible with other wave programs that do not expect this chunk to come after the data.
New password generator being used that is case and 'space' insensitive in the user name field - previously the user name had to be typed in *exactly*.

1.50
Application startup time sped up for owners of CD-ROM drives by not querying the CD-ROM every time the app is started.
Clicking on the 'black' area of the green slider bar will page the display left or right.
Cue items may be added to the cue list while audio is playing (F8 will also add the current cursor location or highlight to the cue list).
Cue list markers and ranges are displayed as blue brackets, or red arrows respectively indicating their locations within the wave.
Current play time is displayed as a wave is played now.
New 'Merge' button added to cue list to merge any two cues into a range (hold down on CTRL to select more than one cue entry).
Added Open Append, and opening of multiple files simultaneously.
Add 'Hand' icon to Graphs to more easily move graph points.
Fixed bug in 8-bit 'dither' conversion from 16-bit that occurred only with clipped audio.
Made separate Undo temporary directory so the undo buffer can be on a separate hard drive if necessary.
Added multi-level undo, instead of just one level of undo.
Convert Sample Type is now undoable.
Added a maximum display size when loading, so the initial display can be limited to a few seconds when a large (several minute) file is loaded.
Added option to keep Cool Edit from writing extra RIFF .WAV information in Options->Info.
Fixed bug in single channel (of a stereo wave) Filtering and Noise Reduction.
Enhanced Noise Reduction function by allowing more FFT sizes.
Fixed bug in Noise Reduction that caused it to stop processing when 99% complete.
Added 6000Hz VOX file format.
Added new Reverb function.
Added Length setting to Stretch function.

1.34b
Fixed EQ presets for Echo function, and Stretch presets.
VOX file format will prompt "Convert to 8000Hz...?" instead of auto-converting.
Fixed bug that caused GP Fault when cursor was out of view and Play was pressed in Play From Cursor mode.

1.34a
Adjusted play bar speed for SBPro cards to be (hopefully) the right speed now for certain wave formats.

Fixed 8-bit stretch function (it was truncating all waves to only the lower half).
Fixed stretching of waves near clipping so distortion does not occur.
Fixed AU file filter so it works properly for saving 8-bit audio, and so it will save properly instead of just writing out the header at times.
Fixed Stretch so choosing an overlap of zero percent will not get errors.
Fixed Quick Filter volume locking and presets (presets were saving as the inverse of what was displayed).
Fixed possible problems with Undo using multiple instances where Undo in one instance would corrupt another instance's undo buffer.
Fixed playing on Sound Blaster cards to prevent "Divide By Zero" errors.

1.34
Custom effects modules (the *.XFM files). See Effects Modules API to build your own!
Last used settings for practically every dialog is now remembered between program runs in the [Profile] section of COOL.INI.
Repeat Last Command function by using F2 (with dialog) and F3 (immediate with previous settings).
Added variable quality sample type conversion.
Added a pause button to pause during playing or recording.
Added a fully configurable distortion effect for getting grunge and blown speaker sounds.
Added a three dimensional echo/reverb effect to simulate acoustics in rooms of any size.
Added a Generate DTMF tones function for making telephone signals.
Added a batch processor to the scripts for running a script on multiple files.
Added new file formats for Next/Sun (.AU), Raw 8-bit signed (.SAM), SampleVision (.SMP), ASCII Text (.TXT), Dialog ADPCM for voice (.VOX), and A-Law/mu-Law for Waves (.WAV)
Auto-play and file format info features added to File-Open dialogs to play sounds through installed sound drivers for preview and view the file format before opening.
Moved file filter options selection to Save As dialog instead of always displaying options when saving.
Single channel editing possible for most functions (that do not change size of waveform).
Improved noise reduction speed for stereo waveforms and added more options. Also displays a noise profile for visual inspection.
Sped up display times in most areas.
Sped up Normalize, Amplify and Envelope on slower machines by integerizing routines.
Added Pause button to progress meter so you can free your system in an emergency without losing your edits.
Broke out Normalize and Invert into separate functional units. Normalize can be used in a script now.
Added decibel scales and logarithmic fades to Amplify.
Modified brainwave synchronizer to have separate high and low settings for intensity and centering.
Generate Tones now has separate initial and final modulation parameters and independently adjustable frequency multipliers that can also vary over time.
Improved reliability of Monitor Source.
New settings options for temporary drive.
Play may begin from cursor or from left edge of screen.
Frequency analysis window displays information in stereo with left=Cyan and right=Magenta.
CD Player controls improved, now you can Insert as well as Eject. Also handles over 10,000 CD titles and song lists. That should be enough for anybody! Also, the IDs used are compatible with the MUSICBOX.INI file, and any CD titles in MUSICBOX.INI will be displayed by Cool Edit.
Added auto zoom button to cue list so double-clicking on cue item opens view to just that cue range, or zooms into the cue point.
Zoom In without any selection zooms in at cursor now, and highlight does not go away when zooming in.
Wave files may be up to 1 Gig in size, which should be sufficient for most applications.
Open and Save As can be recorded into a script for creating more complex scripts that use temporary files.
Current file size and number of samples updated while recording.
Time accuracy increased to 3 decimal digits, and new Frames format added (use Settings to change number of frames per second).

Uses fewer resources per instance, so more instances may be open at once.
Right click extends selection (a shortcut to using shift+left click).
Improved stretch function (preserving tempo or preserving none) by using a better interpolation method.
Added new Fractional Interval Overlap elongation method to stretch (preserving tempo or preserving pitch).
Notes are turned off now when you are not listening to a Music preview.
Filtering has been improved/fixed to be more accurate with less distortion.
Fixed bug in finding proper file format of a waveform (that was a tricky one!).
Fixed bug where Cool Edit crashed when loading in NT while a CD was in the drive.
Progress bar updates ETA time more often, at shorter intervals.
File types added to Extensions section so programs like File Manager have Cool Edit associated with all formats Cool Edit understands (unless format was otherwise associated with a different program).
Progress meter updates ETA time more often for a more accurate result.
Lots and lots of other little tweaks, enhancements, and elbow grease went into this version as well.

1.33
Fixed bug in Filter Transition from initial to final settings... Final frequencies were off.
Frequency analysis calculates fundamental frequency much more accurately.
Added Compressor function to compress/expand dynamic range.
All graphs have double-clickable points to edit the graphical input point directly.
Clicking on any of the graph points displays the point's values below, instead of just displaying the mouse position.
Ring Modulation possible by using "Modulate over Source" checkbox. Instead of generating sine waves, the source is modulated by a the sine wave (or any waveform you choose).
Any type of Modulation possible by using Paste Special's Modulate option.
Noise reduction function added.
Sped up some stereo operations for Filter, Spectral View, and Noise Reduction.
Added smoother 16-bit to 8-bit conversions when copying 16-bit files into an 8-bit waveform.

1.32
Filter has adjustable size (previously used 1024, now smoother filtering can be done by using sizes of 2048 or 4096).

1.31f
References added to the Brainwave Synchronization help.
Cue list and Play list remember their positions better when cutting and pasting shifts their positions.

1.31c-1.31e
Larger files list display.
FFT filter much smoother now (previously had some high frequency noise when doing extremely narrow sharp filters).
Adjustable spatial separation for Generate Noise.
New "smooth" option added to Wave brainwave synchronizer for an alternative "feel" to the sounds. Also the "gamma" range (frequencies above 200 Hz) has been noted.
New independent left and right meters for Monitor Source, as well as peak indicators.
Clicking on the Cool window in the waveform area will ***not*** move cursor location if Cool Edit is not the active application.
New display for stereo waveforms, plus a more precise and consistent display for all waveforms.
Toolbar buttons draw a little quicker now.
Flange and Special EFX have been combined into a new more powerful Flanger, with a Special Efx option.

1.31b
Space bar will act as a 'play' button.

Warning issued when loading a file takes up ALL available temporary drive space.
Pasting low sample rate waves into high sample rate waves works properly now.

1.31a
Fixed Stretching to less than 50% for preservation modes.
Fixed displaying of waves more than 15 megs in size.
Sped up music generation by using temporary files for each note. Long music files can be generated up to 10 times faster, or even more!
Added Open As to open waveforms into any format desired.
Added Select Entire Wave to quickly select the entire waveform, even if the view is zoomed in.
The Paste and Paste Special functions now have a progress bar like the rest.

1.31
Added the Scripts feature, which allows Cool to remember everything you do, and will let you replay it. One script file can contain many individual scripts.
Wasn't loading from command line properly before.
Fixed memory hog/crashing bug in Generate Tones.
Added customizable Toolbar by modifying cool.ini file.
Added play bar to see what part of the wave is currently being played
Added **Autocue** button to Play List to play a single play list item at a time.
Trim is now undoable. Please turn off the Undo feature whenever you are doing really really large operations if you want Cool to run faster, since it will not have to save Undo information.
Added Save Selection to save the currently highlighted portion of the wave to disk.
Improved method for stretching while preserving pitch or tempo for cleaner sounding waves called **Interval Overlap**. See Stretch.
Improved 'time left' reporting when recording.
Increased maximum file size from 248 megs to 536 megs.

1.30b
There weren't supposed to be any more bugs. But we found some:
Using FFT functions sometimes crashed (like FFT, Frequency Analysis, Spectral View, or Music). That has been fixed!
Undo paste when Hilight After Paste was not checked didn't work. It does now.
File filters have been modified to allow any format to be broken up into multiple files. For example, the WAV file format can have several file filters for different compression schemes.
IMA/DVI ADPCM compression filter added to package (dvi.flt), which allows compressing of 16-bit audio down to 4, 3, and even 2-bit (with noticeable loss in quality at 2-bit).

1.30a
Found more bugs: fixed Undo for Paste (special/loop/regular), and Undo Delete.
Fixed Re-Open on PCM files (would hang).
Added Undo for Music.
Added presets for Envelope and Filter.
Added initial/final settings for overtones in Generate Tones.
Revised Music dialog by adding Constant Duration checkbox to replace Adjust Duration.

1.30
Find Frequency is now a graph of the frequency spectrum.
Fixed the remaining known bugs, and completed spec for building custom file filters.

1.29b
Custom file filters (WAV, VOC, PCM, and AIFF currently). See File Filters API to build your own!

1.29a

Selectable wave devices (handles multiple sound cards).

1.29
Edit Left/Edit Right for cutting, pasting, and copying only one channel of a stereo wave.
Adjust sample rate added.

1.28c
Equalizer changed to Quick Filter, since FFT Filter does true, precise filtering.
Graphs have more flexibility with points.
Cue ranges can be associated with keyboard keys, so waves can be played from the keyboard.

1.28a
Spectral View and FFT filtering added.

1.28
File -> Close added.
Customizable presets added to a variety of wave functions.

1.27
Double-clicking on slider bar allows entry of starting and ending samples.
Pre-compute trig tables added to Settings.
Undo function added.

Versions 1.03 to 1.26
Cool Edit is sizeable. You can make your window big or little or whatever.
Wave files may be Dropped into the editor from the File Manager, or other applications supporting Drag and Drop.
New Instance added to File Menu
Added automatic conversion of 16-bit audio to 8-bit while playing for boards that do not support 16-bit audio.
Fixed a major bug having to do with the progress meter. You can now go on to do other things while Cool works in the background on long operations.
Fixed an annoying bug when working with large files that caused the green slider to work inappropriately.
When opening multiple instances of the same wave, different names are given to each instance.
New and Improved Pink noise source. (Ideal for use with the Wave function).
Cue list and Play list supported for looping and custom play order.
New Setting for viewing mode of Dots (original) or Lines (dots of sample are connected by lines).
Digital Delay transformation added to easily spatially locate sounds to the left or right, or for special effects.
New settings option for Save/Save As interpretation of the diskette icon.
Are You Sure? Dialog box added to Silence button.
New waves can be made at any valid sampling rate, by use of the new **Custom** option.
DC Bias Filter added to Amplify to adjust waves skewed by a voltage.
CD Player has been added to play CD's for recording. Song titles may also be entered and restored automatically on future playbacks.
Brainwave frequency (Wave) function has adjustable graph for easier input of multiple frequencies over time.
Sound Blaster VOC file compatibility was added. Not FULL capability yet, because it does not support loops (it only loads the loop once), and ASCII text. It *does* however support Sound Blaster Pro formats for 44.1 KHz-mono and 22 KHz-stereo. It will also load non-standard sample rates if the VOC file was recorded at one.
Echo Equalizer added to Echo function to have each successive echo equalized for truer echo effects, or just snazzy special effects.
The Listen option was added to the music dialog so that the notes could be played through your MIDI

setup as a preview. You can record from the music played as well (if your board supports recording from the on-board synth.)
Envelope option was added to have more control over amplifying waves by using an amplification envelope.
A few new tone flavors have been added for making more natural sounding instrument sounds, which can be used with the Music option.
New options in settings dialog for play/record buffer size, and highlighting after pasting.

Color DIBs can be added to the .WAV file format.
Equalizer settings changed to decibels instead of percentages, making it easier to equalize, since the logarithmic scale is more natural.
Monitor Source meter is in much better *real time* since it now does not depend on the selected buffer size.

Versions 0.5 to 1.02
New algorithm implemented for raising/lowering pitches, and speeding up/slowing down waves.
Preset buttons added to Stretch dialog.
Highlighting is faster for slower video cards.
You can use the Shift+Mouse Button to extend the highlighted selection.
Music option was added to put your favorite samples to music (as if you were playing them on a keyboard) using a very easy to use music editor. Only short riffs are supported right now.
Stretching is cleaner sounding.
The Transpose function has been added to the Stretch option to musically raise or lower pitches of selected samples.
A linked list approach has been taken for working with the temporary disk file when editing. Now Inserts and Deletes are almost instantaneous when working with very large files.(Fixed cut/paste bug from 1.01)
The RAW file format was added for saving only the wave data without any headers.
Edit keys Delete (Delete Wave Selection), Ctrl+Insert (Insert), Shift+Insert (Copy) and Shift+Delete (Paste) were added.
Toolbar was added for quicker access to functions.
The previous Save menu item was changed to Save As, and a new Save was added to save the wave currently being worked on without being asked for the file name.
The Silence option was added to the Transform menu to quickly silence the selection portion.
Extra RIFF information embedded in the .WAV file is now remembered between saves, and can be edited using the Info dialog.
MS ADPCM Compression is supported for loading and saving compressed files now.
A slight bug in overlapping was fixed. Overlap pasting past the end of a wave that used to be longer would revive data past the end of file.
The Stretch transformation was added to allow stretching and compressing of waves, adjusting pitches, or adjusting tempos.
Viewing mode of the Beginning and Ending samples, as well as the time window (which displays how long the viewed portion of the sample is, or how long the selection is) can be changed between samples and time by double clicking on the display.
Generating silence in 8-bit mode works properly now, centering the silence line at value 128.
You may now associate the COOL95.EXE program with .WAV files in the file manager.
Command line loading works. File will automatically play once loaded if another file is not already playing.
Little Yellow Arrows work on files larger than 30,000,000 samples.
Gliding waves from one frequency to another "overshot" before. For example, gliding from 12Hz down to 7Hz would actually glide down twice the frequency, (instead of -5Hz, -10Hz) resulting in a glide from 12Hz down to 2Hz instead. It's fixed now.
Multiple COOL's can be opened at once (which reduced the executable as well) for working with multiple waves at once. It's very easy to copy and paste between waves, even of different formats.
Also, waveform display is instantaneous once loaded in (for example, restoring a minimized long waveform displays instantly instead of recalculating). This allows such effects as the sound level meter running while zooming in and out of a waveform.

Displaying long waveforms now "multitasks" with Windows, so other things can be done while it is loading. The progress meter was fixed slightly to allow multitasking with other applications without crashing Windows.
When saving a file, the extension .WAV is assumed if no extension is typed.
8-bit stereo pasting (with Overlap) works properly now (slight bug caused screeching problems). Also, overlap pasting past end of file works properly too.
A "Musical Source" checkbox was added to the brainwave transformation to eliminate clicks heard when waving musical files.
A Recording level meter was added. Source input can be monitored through the Options menu for setting recording levels.
Lifting up on button after dragging a selection (and leaving the main window) will now act properly, and disengage the selection process
Recording to Sound Blaster Pro works properly. It no longer gives errors and chops up recording. In fact, using COOL to record does a much nicer job than the recorder program provided with most sound cards, and there are no "clicks" or other distractions to contend with.
Using "Large Fonts" on some monitors correctly displays main console, as well as progress meter now.

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Other Acknowledgments
All format types have been reproduced from publicly available documentation. Syntrillium Software makes no claims that they are in any way correct, so they may not be compatible with other interpretations of the same format. It is up to you to first test to make sure that when saving audio files in a particular format, the file generated is compatible with other systems that read the same format.

What Does the Future Hold?
We plan to keep on upgrading Cool Edit, making it more easy to use and useful to more people. We have definite plans for a retail version and we are sure you'll like it! Expect multiple track mixing, real time effects previews, and tons of new *cool* effects and sound generation modules. As always, suggestions are welcome.

New Wave

When creating a new waveform, you must specify the waveform properties. Using higher sampling rates, stereo, or higher bit resolutions will result in higher quality sounds at the expense of requiring more memory.

Sample Rate
The sample rate describes how many times per second to take a *snapshot* of the audio. The human ear can perceive sounds up to about 17,000 cycles per second, or 17 Khz. When choosing a sample rate, frequencies of up to 1/2 the sample rate can be produced effectively. So to reproduce frequencies up to 10Khz, a sample rate of at least 20Khz must be chosen. Any sample rate may be entered in directly, or a common sample rate can be chosen from the list.

8,000 Hz	Telephone Quality
11,025 Hz	Poor AM Radio Quality
16,000 Hz	Reasonable compromise between 11 KHz and 22 KHz
22,050 Hz	Near FM Radio Quality
32,075 Hz	Better than FM Radio Quality (Some boards support 32,000 instead)
44,100 Hz	CD Quality
48,000 Hz	DAT Quality

Channels
Mono waveforms support one channel of audio information. Stereo files take twice the space because there are two channels of information represented, a left and a right channel.

Resolution
This describes the number of bits to use for each sample on each channel. Choosing 8-bit resolution will provide 256 unique "volumes". The PC-Speaker, for example, provides only 4-bits of resolution because it can support 16 unique volume levels. Choosing 16-bit resolution will provide 65,536 unique "volumes", for a 96 dB signal-to-noise ratio. Much quieter sounds can be reproduced at 16-bit resolution than at 8-bit resolution, which only has a 48 dB signal-to-noise ratio. Compact disk players have a 16-bit resolution.

Note: Certain combinations of sample rate, channels, and resolution may not be available on your system. To see the maximum capabilities of your system, look at the status window when starting the program. you may create and edit files that cannot be played on your system, you just may not be able to play them properly.

New Instance

... Or "Give me another window"

Selecting New Instance will open another Cool Edit window as if you opened another instance from the Program Manager. This may be handy when you need a secondary window to do some editing in, and don't want to disturb the original wave. Mixing between waveforms in different windows is supported, just use Copy, and Paste to insert or Paste Special to overlap and mix.

Opening a Waveform As Any Format

This works just like Open except that the sample format can be specified before opening. If the sample format selected is different than the native format of the wave being opened, then it will be converted, using the "quick-and-dirty" conversion method. This means that if the target sample rate is different, the conversion will not try to pre-filter or post-filter the samples. This function works great for opening files as different bit rates and number of channels, but for differing sample rates, open the file normally, then use Convert Sample Type

After choosing the filename, choose the new sample type. The waveform will be opened, and converted as it is opening.

Appending a Waveform

You can append any waveform to the end of the current waveform. If the waveform being appended is of a different type, it will be quickly converted as it is being copied. It is advised that you only append waveforms of the same sample rate for best results, since no interpolation is done when resampling waveforms of differing sample rates. See Open for more information on the Auto Play and Show Info options.

Each wave type supported is embodied in a filter (*.FLT) file. See Wave Formats for descriptions of the various formats.

Re-Opening a Waveform

This will reload the previously loaded waveform, replacing any changes that were made to the waveform being edited. Be aware you will lose any changes you have made since the last time the wave was saved.

Saving a Waveform

Waveforms can be saved in many formats. Having many format options gives you the chance to save the waveform in the smallest amount of space while still retaining a high level of quality. PCM formats are the only kind that save the entire wave completely with no data loss. ADPCM formats lose some of the original waveform information and the waves sound a little distorted. Mu-Law and A-Law formats also lose some of the information, but it may not be as noticeable as ADPCM, but it depends on the type of audio that is being saved.

Some file formats support various options that can be modified by pressing **Options**.

See Wave Formats for a list of supported formats.

Edit menu

The file menu displays all the waveform editing options.

Edit Menu Options:

- **Undo**
- **Repeat Last Command**
- **Copy**
- **Cut**
- **Paste**
- **Paste Special**
- **Select Entire Wave**
- **Edit Left**
- **Edit Right**
- **Delete Selection**
- **Trim**
- **Display Time Format**
- **Viewing Range...**
- **Adjust Sample Rate...**
- **Byte Swap...**
- **Spectral View / Waveform View**
- **Convert Sample Type**

Trim

Trim is the exact opposite of delete, which means everything is deleted *except* the portion that is selected. Only the selected portion is kept. This is handy to quickly pick out the part of a recording you want to keep.

Use CTRL+T to quickly trim the selected portion of the wave.

Display Time Format

Selecting **Edit -> Display Time Format** and choosing either Decimal, Frames, or Samples will change the format of the Begin, End, and Time windows. Double-clicking on the waveform ruler, or the Begin time window will change the format of the ruler.

Viewing Range

Selecting **Edit -> Viewing Range** or double-clicking on the green/black samples portion bar will bring up the viewing range window.

Enter the leftmost and rightmost samples that you wish to have displayed. Use this function to highlight a specific number of samples by double-clicking in the wave editing area after selecting the viewing range to "select all". Remember, Select All only selects the viewing range, not the entire waveform.

Byte Swapping

You can change how Cool Edit interprets the actual waveform data by swapping high and low order bytes in 16-bit mode, or by adjusting the signed/unsigned interpretation of bytes in 8-bit mode. Swapping the byte ordering comes in very handy when loading in waveforms of unknown type (raw PCM). You can try swapping the bytes if the waveform does not sound correct.

Spectral Viewing

Choosing **Spectral View** will display waveforms by the by their frequency components. This is a handy function for analyzing your audio data, to see which frequencies are most prevalent throughout your data.

The more abundant a frequency is, the brighter the color displayed will be. Colors range from dark blue (next to no frequencies in this range exist) to bright yellow (frequencies in this range are very strong). On 256 or higher color displays, there will be more gradations between the colors. See the Settings topic form information on various settings for spectral view. The frequency resolution, window type, colors, and energy plot can all be fine tuned.

Lower frequencies are displayed near the bottom of the display, while higher frequencies are displayed near the middle on to the top. The display is linear. White lines on the left and right divide the display into 1/2, 1/4, 1/8, and so on. To top of the display represents frequencies at just below the Nyquist frequency, or 1/2 the sample rate. So if a bright spot appears near the top of the display for a signal sampled at 22 KHz, the frequency being represented is near 11 KHz.

To gain higher resolution and see more detail in the lower frequencies, use Convert Sample Type to downsample the waveform to a lower sample rate. The higest frequency value displayed will be one half the new sample rate.

Choose **Waveform View** to return to original waveform view mode.

Convert Sample Type

This function converts the sample type "in place" by directly converting the types of the samples in the temporary file that represents the current waveform. Various levels of quality can be chosen, as well as general volume levels when converting between mono and stereo formats. Higher quality settings take longer to process, but at the highest setting the resultant waveform is identical to having sampled the material at the new rate to begin with.

High quality settings should be used for greater downsampling ratios. When upsampling, the Low quality setting sounds nearly the same as the high quality setting. The difference lies in a larger phase shift in the higher frequencies, but since the phase shift is completely linear, it is very difficult to notice. Downsampling at even the lowest quality setting will not have any undesired noisy artifacts. Instead, it may just sound a little more muffled because of more high end filtering.

When converting from Mono to Stereo, you can choose the amplification levels for both channels independently, with 100% for both channels being the default. You can choose a value of -100% for one of the channels to get an "inverse mono" effect, where the left channel is the inverse of the right. When converting from Stereo to Mono, you can choose the amplification values for each channel before they are combined. Values of 50% for both channels is the default, meaning that the resultant mono waveform has (l+r)/2 signal, or the average of the two channels. You can even choose a negative value for one of the channels to perform a vocal cut effect on some audio.

When converting from 16-bit resolution to 8-bit, you can optionally add some dither in the audio to make sounds still audible that are quieter than the limit that 8-bit audio provides. To do this, a small amount of noise is added to the signal, but quieter audio can be heard in the noise. If dither is not checked, quiet audio will just fade in and out, with a more disruptive choppiness sound that resembles rain falling, or static. Whether or not dithering is used depends on the audio being converted, and your preferences.

Transform menu

The Transform menu displays all the waveform transformation options. Waveform transforms are encapsulated in the .XFM files.

Transform Menu Options:

- **Reverse**
- **Silence**
- **Invert**
- **Music**

The following are embodied in XFM files, and may change at any time. If the function you need is not listed, go to the function directly and view its help information

- **Quick Filter** **
- **Amplify**
- **Channel Mixer**
- **Compressor** **
- **Delay** **
- **Distort** **
- **Echo** **
- **Echo Chamber** **
- **Envelope** **
- **Filter** **
- **Flange** **
- **Noise Reduction** **
- **Normalize**
- **Reverb** **
- **Stretch**
- **Wave**

** **Function not available in Lite version.**

Musical Incantations

Now you can put your clippings to music, or just harmonize a wave using a particular chord. To choose a clipping for your sample, select the range you wish to use as a quarter note. If no range is selected, the clipboard data will be used. Note that the clipboard data will be filled with your sample automatically once music is generated, thus selecting music a second time will automatically use your last sample.

This function is by no means a complete MIDI authoring studio. It is just meant as a quick and simple way to put a sample to music. The only MIDI support is in the preview playback when the Listen button is pressed.

How to build a song
Simply drag the notes and rests you desire to the music bar above. To sharpen or flatten a note, drag the sharp (#) or flat(b) symbol on top of the note you wish to transpose. You can move notes up or down after they have been placed, or pick them up to insert in a new position. To remove a note, pick it up and drop it off away from the bar.

Use the scroll bar to work on individual portions of the song at a time. You can scroll to write a piece as long as 256 notes.

Tempo
The tempo is given in quarter notes (beats) per minute. Your sample's length is the length of a quarter note. If your note is longer than the period determined by the tempo, then the notes will overlap.

Key
You may choose to have your music interpreted in any of the standard key signatures. The key of C is the standard (white keys).

Constant Duration
If chosen, all notes will be the same length as the original sample, regardless of pitch. The operation that does this takes longer to calculate, but high pitched notes will be the same length as lower pitched notes. The Interval Overlap method is used with an overlap of 80% and an interval of 30 Hz. If not checked, the note is created by directly stretching or compressing the original sample, resulting in higher pitches being shorter than lower pitches.

Exact Tune
Choose Exact Tune to tune your sample so that when played at A (above middle C), the frequency of your sample is at 440Hz If this is not checked, your sample's original frequency will be played at A (above middle C).

Chords
The triplets of numbers to the right is the chord selection box. You can choose to make a chord out of 2, 3, or 4 notes, then choose the chord from the list. Finally, pick up a chord object (the 3 notes on top of each other) and drop it on a note above. The note you drop it on will be the starting note of the chord, and the other notes will automatically appear above it in the right ratios.

Clearing Chords, Sharps, or Flats
If you want to clear a sharp, flat, or chord from a note, use the faded looking quarter-note object, and drop it on the note you wish to bring back to normal

Saving Your Songs
If you make a cool song you want to keep, give it a name in the **Song Title** box. In the future, you can choose your song from the list of song titles that you created. The actual song data is saved in the file

SONGS.INI in your Windows directory.

Listen

If you have MIDI play capabilities, you can listen to a preview of your song before actually creating it. Play begins at the leftmost note visible on the staff, which means play begins at the position you are scrolled to, and continues on to the end of the song. The music is played through channels 1 and 13 for Extended and Base level compatibility. The instrument can be chosen by typing its instrument number to the left. You can record music played by the listen preview button. Simply hit the record button first, then go into the music dialog and press Listen. When the song is done, hit Cancel, and then Stop to stop the recorder.

Pink

What the heck is this button for? Well, it automatically plays the chosen instrument through the MIDI, using pink noise as the source for randomness. Maybe once out of 1 million tries, it may actually write a cool song? Tempo, Octave, and Key all affect the play of "pink" music. The only purpose for this button we have found so far is to open the Play List first, then open the music dialog. While listening to a relaxing soundscape from the play list, you can listen to relaxing random music at the same time. (?) (!)

Quick Filter

The 8-band quick filter allows one to customize to suit most filtering needs. The "equalizer" works pretty much the same as a standard audio equalizer does. Except that the bands are not the same as you would expect. The highest frequency band *will* increase or decrease the high end, but it will also increase frequencies all the way down to the lowest as well, but it will increase the high frequencies more than the low ones. The effect is close to an equalizer, but not quite. Basically, this is a handy function for changing the tone of your sample (such as noise) to make it more pleasing to the ears.

Equalizer Bars
Adjusting these increases or decreases the frequency component specified beneath the bar.

Volume Bars
The final volume after equalizing may be adjusted to suit your needs. Checking the **Lock Vol** checkbox will lock the left and right scroll bars.

Flat
This simply places all equalization values plus volume adjust at 100%

Lock Initial/Final
When locked, the entire selected range is equalized with the setting shown. If unchecked, the initial and final equalization settings may be adjusted, so the selection can smoothly glide from the initial equalization setting to the final setting over the range selected.

View Initial
When Initial/Final is not locked, choose this to select the initial equalization settings.

View Final
When Initial/Final is not locked, choose this to select the final equalization settings.

This function supports Presets.

To produce a semi low-pass filter, set the higher frequency scroll bars to zero to cut out higher frequencies. A high pass filter can be done in the reverse fashion, by zeroing out the lower frequencies.

Very interesting effects can be made by selecting widely varying initial and final equalization settings.

Note: Setting the lower bands to very high values can, and most times will, result in clipping if the volume adjustment is not turned down.

For serious filtering, see Filter.

Amplify

Amplify will increase or decrease the volume of the selected sample.

Initial Amplification
This is the amplification that will affect the beginning of the selection. Choose a separate final amplification for fading up/down effects. An amplification value of 100 will keep the signal unchanged.

Final Amplification
This is the amplification that will affect the ending of the selection. Setting both the initial and final amplifications to the same value will amplify the entire selection the same amount.

Lock Left/Right
Left and Right channels may be amplified at separate values. If the Lock is checked, then the scroll bars for the left and right channels are locked to the same value. Effects such as panning from left to right can be achieved by choosing separate values for the left and right channels.

Logarithmic Fades
Also known as Power fades. When checked, the power of the signal fades at a constant rate. When not checked, the sample values fade linearly. As seen on screen, linear fades look like a flat slope, while power fades usually look like a hill that starts steep and gets less steep as time goes on (or the opposite depending on whether you are fading in or out).

dB Scale
When checked, amplification values are entered in decibels, otherwise they are entered as a percent of the original waveform.

DC Bias Adjust
Adjust the waveform so it is centered on the center line (0 %). If samples are recorded with a DC Bias, they will appear to be above or below the center line. They must be centered before doing other waveform transformations, and choosing this will center the wave properly. To skew the entire selected waveform above the center line, enter the percentage to move the waveform up in the adjustment box. For example, 50% will move the entire waveform up half way, and a -50% will move it down half way.

Normalize
Pressing the Normalize button will calculate the greatest amplification for the sample that will *not* result in clipping when set to 100%. If the left and right scroll bars are not locked, separate left and right values will be computed, potentially amplifying one channel more than the other. To normalize to less than the maximum range, enter the percentage of maximum to normalize to. For example, choosing 50% will compute values needed to amplify the file no more than 50% of maximum, resulting in a 3dB attenuation from maximum output. If two sounds normalized to 50% are overlapped, the resultant wave is guaranteed not to exceed the boundaries, and will not clip. All this button does is recalculate the amplification values for you based on how much normalization is needed. To normalize in one step, use the Normalize function.

To achieve a fading in effect, choose an initial amplification of 0, and a final amplification of 100. For fade outs, do the opposite by setting the initial to 100 and the final to 0.

Note: This Normalize button only calculates the values needed for the desired normalization. If you are recording a script, only the final values will be remembered. If you want to add normalization to a script, use the Normalize function instead

This function supports Presets

Fade In Preset
Initial amplification is set to zero, and final is set to 100 for a fading in effect.

Fade Out Preset
Initial amplification is set to 100, and final is set to zero for a fading out effect.

Pan L->R, Pan R->L Preset
Initial and final values are set so that the sound starts at one channel and pans to the other.

Channel Mixer

On stereo waveforms, the channel mixer allows one to have total control over the left and right channels. The default values will leave the wave unchanged. For mono waveforms, the wave is inverted (that is, crests become valleys, and valleys become crests).

New Left Channel
The slide bars give the percentage of each channel, left and right, that will go into the final wave after mixing. Choosing an L of 0, and an R of 100 will make the left channel equal to the right channel.

New Right Channel
These two slide bars do the same, but for the right channel.

Invert
Choosing invert for either channel will invert the channel. Peaks become valleys, and valleys become peaks. By inverting *both* channels, there will be no perceived difference in sound when listened to. But, inverting only one channel will greatly change the sound when listened to.

This function supports Presets.

Vocal Cut Preset
This will sum the left channel with the inverse of the right, and place the result into both channels. On music where the vocals are heard equally loud on both channels, the vocals will disappear, or come close to disappearing.

By playing with the combinations, effects of swapping channels, creating a mono sounding wave that is equal to the left, right, or a mixture of both channels, and creating waves whose left channel is the inverse of the right can be done.

Function Presets

Many of the functions have presets available for easily recalling your favorite settings. New presets can be added at any time. All preset information is saved in the cool.ini, usually in your Windows directory.

Double-Clicking on any preset will instantly set all controls in the dialog box to that preset.

Whenever you have settings you would like to keep, you may enter name for your settings, and press the **Add** button. Be careful though, since there is no rule against you adding two presets with the same name. This can get confusing if the presets are different.

To remove a preset from the list, choose the preset, and press **Del**.

To modify an existing preset, **double-click** on the preset name, make your modifications, then press **Del** immediately followed by **Add**. This will delete the old preset and add your current settings in under the same name.

If all presets are removed, the default presets will automatically be reloaded.

If you are finding that your presets are not being saved the next time you use the function, check to see that the cool.ini file is not more than 64K in size. This should never happen, but it may be possible if you have hundreds and hundreds of presets.

If you obtained a new version of Cool Edit, and find that your presets have disappeared or double-clicking on them brings up something mysterious and not the settings you wanted, then we apologize. In making new versions it is sometimes necessary to change the order of entries in the INI file to make room for new items, etc. Just remove all your presets to get the Cool Edit defaults and start from there. Again, our apologies if this happened to you.

Compressor/Expander/Limiter/Noise Gate

The compressor function varies the output level based on the input level. This allows one to expand or compress the dynamic range of a sample, limit the dynamic range so all audio is at roughly the same level, or create a noise gate where all audio below a certain level is clipped to zero. This is all accomplished by use of a transfer function that is drawn using the **graph**. The graph depicts input level along the x-axis (left and right) and the new output level along the y-axis (up and down). A line from lower-left to upper-right (default) leaves the signal unchanged, since every input value goes to the exact matching output value. Other weird transfer functions can be drawn as well, for example, boosting all input that has a level of around -20dB, and leaving everything else unchanged. Or, drawing an inverse line (a line from upper-left to lower-right) will dramatically boost low amplitudes while dramatically suppressing high amplitudes, that is, all quiet sounds are loud, and all loud sounds are quiet.

Invert
The invert button will change the graph to one that will function as the exact opposite. For example, if a transfer function with a compressor characteristic is being displayed, pressing Invert will change the graph to one with the corresponding expander characteristic. For a graph to be invertable, it must have points in the two corners (-100,-100 and 0,0) and it must be always increasing in output (i.e. you cannot go down in output volume as you go from left to right). All segments must be sloping upwards from left to right.

Attack Time
Attack time determines the time it takes for the new output signal to reach the proper output volume. If there is suddenly a quiet portion that drops 30dB, it will take this much time before the output actually drops to its corresponding volume level. If the sum of Attack and Release times is too short (less than about 20 ms total), audible effects can be heard, such as a "vibrating" sound at a frequency of 1000/<time>. So if the Attack and Release times are each set to 5 ms (making 10 ms total), then a vibrating sound at 100Hz can be heard. Thus, a total value of about 30 ms is about the lowest you can go without getting these effects.

Release Time
This is the time it takes the end of a previous output level to reach the proper output volume. For example, where the Attack is the time it takes the start of a pulse to reach the desired output volume, the Release is the time it takes for the end of the pulse to reach the desired level.

Samples/Group
The number of audio samples to group together into one volume level change. A value of 1 is the best, so each sample gets its own volume change. Larger values will change that many samples together at a time. You can go larger without noticeable changes in quality. The only reason for using larger values would be for speed, as larger values calculate much faster. Use larger values for pre-viewing how a compressor is going to sound, then Undo, and use a value of 1 when the compressor is set just the way you want it.

Joint Channels
In Stereo, each channel can compress independently, sometimes causing the surrounding background noise to get louder on one channel at a time, which may sound strange. For example, a loud drum beat in the left channel will make the background noise sound louder in the right than in the left. If Joint Channels is checked, both channels are used to find a single input dB value, and both channels are amplified the same amount, together. For example, a loud drum beat on the left channel will cause the right channel to go quieter as well if compressing.

Compressors are used for the compression of the dynamic range of an audio signal. It is generally an amplifier with two gain levels: the gain is unity for input signal levels below a certain threshold, and less

than unity for signals with levels above the threshold. Compressors can be used to eliminate the variations in the peaks of an electric bass output signal by clamping them to a constant level, thus providing an even solid bass line. To maintain the original character of the instrument it is necessary to use a compressor with a long A/R time compared to the natural decay rate of the electric bass. Compressors can also be useful to compensate for the wide variations in the signal level produced by a singer who moves frequently, changing the distance from the microphone. **Limiters** are compressors with a compression ratio of 10:1 or greater because their output levels are essentially clamped to the threshold level. A limiter can be used to clamp all audio to a prescribed output level, or just all audio above a certain threshold.

Expanders are used to expand the dynamic range of an audio signal, opposite of the compressor. It can also be considered an amplifier with two gain levels: the gain is unity for input signal levels above a certain threshold, and less than unity for signals with levels below the threshold. The expander is used to expand the dynamic range of an audio signal by boosting the high-level signals and attenuating the low-level signals.

Noise Gates are a special type of expander that can be used to reduce noise below a threshold level. It attenuates heavily signals with levels below the threshold. It is used to totally cut off the signal level during a musical pause so as not to pass the background noise present. It can also be used to silence the pauses in speech.

RMS mode
This is a new graph interpretation method that more closely matches the way people hear volume This will cause the output to be exactly the RMS amplitude specified in the graph. For example, a limiter (flat horizontal line) at -10dB will cause the RMS amplitude of the result to average -10dB (where 0dB is a maximum amplitude sine wave without clipping).

Peak mode
This is the method that has been used in previous versions of Cool Edit. This method is a little more difficult to use, but it equates to the RMS value times two. That is, if the RMS value was -20dB, then the equivalent peak value would be -40dB. This occurs because the RMS value calculated was mapped to a peak sample value for output This method is basically here for backward compatibility with previous versions of Cool Edit.

Digital Delay

Delay either channel up to 50 milliseconds with the option to mix in the original signal with the delayed signal. Great for effects such as spatially locating a previously mono wave source to the left or to the right, so that the sound will appear to emanate from that direction when listened to with stereo headphones. Delays of longer than 50 ms may be entered for creating a single echo.

Delay (ms)
The actual amount of time to delay the channel in question.

Mixing
You may choose to have the resultant wave the delayed signal, keep it the original signal, or mix the two. A value of 50 will mix the two evenly.

Invert
The delayed signal may be an inverse of the original if this is checked. More special effects!

This function supports Presets.

Tunnel Preset
The Tunnel preset can be used with mono as well as stereo waveforms. The settings provided give a nice tunnel/tubular effect.

Spatial Left Preset
If a mono wave source was converted to stereo (so that the left and right channels are the same), then choosing this will make the sound appear as if it is coming from the left, since the right channel is delayed just enough so your brain interprets the sound as coming from the left. You must use headphones to hear the effect.

Spatial Right Preset
The same as Spatial Left, but it locates the sound to appear as if it is coming from the right.

Distortion

Use this function to map any sample value to any new sample value. Effects such as blown car speaker, muffled microphone, overdriven amp, cranked car stereo and many more can be created.

The horizontal axis represents the input sample value in dB, while the vertical axis represents the output sample value in dB.

Have fun making your audio sound really really BAD! (Of course, it's great for adding fuzz to guitar licks to get that heavy metal sound).

Echo... echo... o...

This function creates continuous echoing and reverb effects. Each successive echo decays in amplitude by the falloff ratio. To create the effect of a single echo, use the Delay function instead.

Falloff Ratio
Each successive echo will be a certain percentage less than the previous one. Choosing a falloff ratio of zero would result in no echo at all, while choosing a ratio of 100 would produce an echo which never gets quieter.

Delay
This is the number of milliseconds to place between each echo. A delay of 100 milliseconds is equivalent to a 1/10th of a second pause between echoes. Choosing very small values of delay produces quite interesting effects.

Initial echo volume
This is the volume at which the echoes will be mixed with the original sample. Choosing smaller percentages (30% or so) is nice if the effects of the echoing at 100% make the sound incomprehensible.

Continue beyond selection
Choosing to continue beyond selection will echo the highlighted selection over the rest of the unhighlighted area, stopping at the right-hand edge of the wave that can be seen in the window. If the window is zoomed in, the echoing will stop before the end of the file, since it will stop at the right hand side of the portion on screen. By using this option a single word, for example, can be highlighted and echoed over other audio, without echoing the other audio as well.

Echo Left to Right
Selecting this option will make the echoes travel back and forth between the left and right channels.

If you wish to echo the right channel only, select an initial echo volume of 100% for the right, and 0% for the left.

Equalizer
The echo "quick filter" lets you choose approximately which frequencies get removed from the echo first. A setting of zero will leave the frequency band unchanged. You can choose the frequencies that are "absorbed" as the echo progresses. The echoed sample is re-filtered through the quick filter on each successive echo. Setting all values to zero turns off the equalization, since no frequencies are to be absorbed.

This function supports Presets.

3D Echo Chamber

This function will calculate the actual echoes as if the source audio (highlighted selection) and microphones (destination channels for echoed wave) were in a room of any given size and with walls of any given dampening factors. The number of echoes to calculate is adjustable, up to about 25,000 echoes. The more echoes there are to calculate, the longer it will take the function to complete. Practically any "ambiance" setting can be created using this function.

One great use for this function is to convert Mono audio to Stereo with all the right ambiance. Choosing a "left" microphone that is one to two feet away from the "right" microphone will simulate the ears of a listener, and will give the effect of "being there" when listened to with stereo headphones. Be sure to copy the mono audio into a stereo format before performing the echo so you can choose two separate microphone locations. A spatial stereo expansion effect can be created by placing the two microphone locations far apart, further apart in the settings than you will be playing them through speakers in real life. For example, if your stereo speakers are 6 feet apart, try placing the left and right microphones 20 or 30 feet apart in the settings.

To give more control over the environment, dampening factors can be applied to any of the 4 walls, floor, and ceiling. If a wall has a dampening factor of 1.0, it is totally reflective (like cement). If a wall has a very low dampening factor, like 0.05, it will absorb most of the sound (like carpeting or sound proofing panels). You can also lower the dampening factor of some of the walls to simulate the fact that other objects in the room are absorbing some of the audio.

Always place the microphone(s) sufficiently far from the source. If the microphone and source are too close together, you will just hear the source and no echoes since it is analogous to placing your ear right next to the sound source where you hear the sound only (which is very loud) and nothing else.

Room Size
The length, width, and height of the room can be entered in units of feet (sorry, no metrics this time... There are approximately 0.3 meters per foot for those who need to convert). When entering source and microphone locations, they must lie between zero and the room's width for the "Distance from Left" parameter, and zero and length for the "Distance from Back" parameter. Room sizes can be as large as memory will allow.

Intensity
The volume of the echoes is determined by the volume of the first (direct) audio. The direct sound that reaches the microphone from the source will be at the same amplitude as the original audio being echoed. Thus, in a room of any size, if all 6 dampening factors are set to zero, there will be no change when echoing. Every echo adds to the amplitude of the finished audio, so the intensity should be set to less than 100%. In fact, the more echoes there are, the lower this value should be set to prevent clipping. In general, use about 30% for 100 echoes, 5% for 1000 echoes, etc.

Echoes
This is the number of actual echoes to produce. To get a nice reverb and ambiance effect, at least 300 echoes should be generated. The more echoes that are generated, the truer the result will sound. You must sacrifice the quality you desire with the time you are willing to wait for the final product. Generate about 100 echoes or so to test the chamber size and general room sound, then increase that dramatically for the final production. Up to 25,000 echoes can be generated, perhaps even more depending on the size of the room and size of memory.

Damping Factors
Use the damping factors to set the type of room in which the audio is being played. The factors can simulate wall coverings, floor coverings, and other objects in the room that absorb sound. Granted, in

real life, various objects absorb different frequencies of audio. In this simulation, all frequencies are reflected equally. The effects of speaker placement enhancing or canceling certain frequencies, though, is still accurate. The fact that cement reflects high frequencies better than low ones is not accounted for, but great effects can still be achieved, and these effects are much more realistic than the basic Echo function. A damping factor of 1.0 is the greatest, simulating total reflectivity. A factor of 0.0 is the lowest, for total sound absorption by the reflecting surface.

Source Signal Placement
The source (highlighted audio before running this function) can be placed anywhere in the room. The audio is simulated as a point source of audio, not directional. This means the audio will radiate outwards in all directions from the source, and not more in one direction than another. The distance the source is placed to any of the walls will affect the frequencies that are enhanced. In other words, source signal placement is crucial to the ambiance effect that is gained with this function. With stereo source, each channel can be placed independent of each other.

Microphone Placement
There can be up to two virtual microphones. Each microphone represents a destination audio track. The audio placed back into the waveform (the result of the echoing) is exactly what the microphone would hear if it were in the room at the location specified. Stereo signals have two pick up microphones while mono signals have only one, since there is only one channel in which to place the result. Placing the microphones in a stereo setting one foot apart will simulate the ears, and when listened to with stereo headphones, will sound as if you were actually in the room (if enough echoes are generated). The brain will be able to pick out the directions of each echo, as well as the fact that the delays of the echoes will give the brain cues as to the size of the room. Placing the microphones very far apart and listening with headphones will give a very large "aural" or "Spacy" feeling to the audio, like it is all around you and inside you. Don't place the microphones too close to the source, otherwise the relative volume of the echoes will be so low that they will not be able to be heard.

Mix Left and Right into Single Source
When working with stereo audio, there are actually two source signals, one for each channel that can be placed independently. This takes twice as many calculations as a single audio source, so this option allows you to mix the left and right into a single point source for faster calculations.

Experiment with various settings to get the reverb you desire. Some presets are available, but a big part depends on the type of source audio that is being echoed.

Envelope

By using an envelope, you have great control over which parts of your wave are amplified, and by how much. A point at the top of the graph is 100% (normal) amplification, and at the bottom is no amplification (silence). This function is handy when modifying Tones generated with this program to create more realistic sounding instruments and effects.

Amplification
Adjust this value to amplify more than 100%. This value changes the values represented by the graph.

Click in the graph area to add control points. You can drag control points up and down. Drag a control point off the graph area to remove it.

This function supports Presets.

Note: This function relies on the AMPLIFY.XFM module for doing the actual amplification.

FFT Filtering

You may filter out undesired frequencies, or just keep certain desired frequencies by using the **Passive** mode.

Use the **Logarithmic** mode to boost or dampen frequency components.

When the **Lock** is not set, you can choose both an **Initial** and a **Final** filter. Filtering will gradually go from the initial state to the final depending on the Transition settings.

Graph Values in dB or percentage (depending on logarithmic or passive mode) can be entered to the right of the graph. These values are independent of the shape of the graph, which means that loading a preset *will not* change these two values.

The **Precision Factor** determines how accurate you want the filtering over time when separate initial and final settings are used. A low factor, means the filter settings will change roughly, or in chunks, from the initial to the final settings. With higher factors, the filter's transitions are much smoother. In any case, the higher the precision factor, the longer it will take to filter your selection, but the nicer it may sound. The FFT (Fast Fourier Transform) function takes a large group of samples, and filters them all at once. The precision factor determines how many samples from the entire group are actually saved in the final product. A factor of two means that half the samples are saved back. A factor of 10 means that 1/10 of the samples are saved back. Since there can be only one filter setting for the entire group of samples, you will want smaller groups of samples if the settings are varying widely over short periods of time.

The **Points** parameter specifies the size of the FFT to use. For cleaner sounding filters, use higher values. The maximum value currently is 8192, and the value must be a power of two. Recommend values are 1024, 2048, 4096, and 8192.

Windowing Function
This is the windowing method used when filtering. Different windowing methods give different frequency responses. The Hamming and Blackman windows give great overall results. The windowing method determines the amount of transition width and ripple cancellation, and are in order from smallest width and greatest ripples to widest width and least ripples. The filters with the least ripples are also those that more precisely follow the drawn graph, and have the steepest slopes, even though they are wider, and pass more frequencies in a band-pass operation. Try different Windows if you are not getting the effect you desire.

If **Morph** is checked, the transition from the initial filter settings to the final filter settings will actually "morph" from one to the other If this is not checked, the settings simply change linearly over time, which means if you have a spike at 10K for the initial filter, and a spike at 1K for the final filter, the spike at 10K will gradually decrease, and the spike at 1K will gradually increase over time. If morphing is on, then the spike will "ooze" from 10K down to 1K, passing many of the frequencies in between.

Really nice effects can be heard by simply choosing the **Passive** mode, and having an initial setting with first half of the filter at 100%, and the second half at zero for the initial filter, and the right 1/10th or so at 100% with the rest at zero for the final filter. This selects high frequencies for the initial configuration, and low frequencies for the final configuration. To get a nice blending from high to low, choose **morph** to blend the two together by including all the frequency combinations between the two filters. To see exactly what is happening as the filtering changes from the initial configuration to the final, choose Transition to view the actual settings that will be used over the duration of your selection.

The noise level of the filter is lower than that of 16-bit samples, so there should effectively be no extra noise induced by using this filter depending on the Window being used. A Blackman window, for

example, will have the stop band noise below the -96dB mark.

This function supports Presets.

For best results, filter using 16-bit samples. If your source is 8-bit, Cool Edit will automatically convert to 16-bit to do the filtering, and convert back to 8-bit. But if you are doing multiple edits, you should use Edit->Convert Sample Type to convert to the 16-bit format. You can convert back to 8-bit when you are all done processing.

Flanger

What *is* flanging you ask? Just try it out and see! The term is coined from the flanging mechanism on the old style tape recorders which, when fiddled with, would slow down the playing of the tape, and speed it back up again when desired. That is how they got those funky psychedelic sounding recordings in the 60's. Here's how you can do it today.

Original - Delayed slide
This slide decides at what proportions to mix the original and flanged signal. If the Original is at 100%, no flanging is heard. If the Delayed is at 100%, a cute wavering (like a bad tape player) sound is heard. Portions of both signals need to be present for there to be canceling out, and reinforcing of wave patterns between the two signals.

Initial Delay
Flanging will start with the delayed signal this many milliseconds behind the original.

Final Delay
Flanging will end with the delayed signal this many milliseconds behind the original. If the delays are the same, the effect disappears, since the delayed signal will not change.

Stereo Phasing
The right channel can be at a separate delay than the left channel. A phasing of 180 will put the right channel at the initial delay value when the left channel is at the final delay value, and vica versa.

Rate settings
The **Frequency**, **Period**, and **Cycles** settings are all interrelated, and refer to the rate at which the delay cycles between the initial delay and the final delay. The flanging will cycle *frequency* times per second, or *period* seconds per complete cycle, or a total of *cycles* complete cycles over the entire selection. Various effects can be heard by using different settings. For example, if 0.5 cycles is chosen, the selection will start with the initial delay, and end with the final delay. If a frequency of 4 is chosen, the flanging will cycle from the initial delay to the final delay and back again 4 times per second.

Invert
Invert the delayed signal when flanging, which causes the waves to cancel out periodically, instead of reinforcing. If the mixing is at 50/50 then whenever the delay is at zero, the waves will cancel out to silence.

Special EFX
A mixture of both normal and inverted flanging, with the delayed signal summed, and a future signal subtracted out. So this option will mix not only a delayed signal, but a future one as well.

Sinusoidal
If checked, the transition from initial delay to final delay and back will follow a sine curve. Otherwise, the transition is linear, and delays from the initial setting to the final setting at a constant rate. With sinusoidal checked, the signal is at the initial and final delays more often than it is at delay in-between.

By trying different combinations of Invert, Special EFX, and Sinusoidal, you should be able to create just the effect you want. These three options give a lot of control over the flanging effect, so experiment with them all!

This function supports Presets.

Noise Reduction

Background noise and general broad band noise can be dramatically reduced with minimal reduction in signal quality. The amount of noise reduction depends upon the type of background noise, and the allowable loss in the quality of the signal that is to be kept. In general, increases in Signal to Noise ratios of 5dB to 20dB can be achieved (noise is reduced 21dB and signal 1dB for example).

Two steps are required to remove noise. First, the noise level must be set so the filter knows what type of "noise" to remove. To do this, highlight a section of the waveform that has no important signal in it, and only has background noise, then press **Set Noise Level**. The statistical information about the background noise is then gathered, and you are set to remove all noise of this type from your waveform.

Once the statistical data is gathered, the second step is to highlight the section you want to remove the noise from, and choose the level of reduction you desire. A level of zero will remove the least amount of noise, and nearly no signal loss will occur. Typically the noise will be reduced about 3dB at this level. A level of 100 will remove the maximum amount of noise, lowering the noise level by about 20dB. If the signal you are trying to keep gets too distorted at this level, use lower values until a balance is reached between noise reduction and allowable signal distortion. Values any higher than 100 will guarantee loss of the signal that you want to retain, but this may be desired if reducing noise is more important than retaining original signal.

Distortion effects may manifest themselves a "hollow" or "underwater/burbley" sounding signal, dull sounding impacts, "rolly" high end, or a "computerish" mechanical sound. These effects, if heard at all, will fall off if the noise reduction level is reduced. The amount and type distortion depends on the type of noise that is being filtered.

Besides reducing the noise level, the type of noise that is present after reduction is entirely different than the type of noise beforehand. For example, if you are trying to get rid some "tape hiss" from a waveform, the tape hiss sound will completely disappear, and in its place about 15dB quieter will be completely different type of noise. This noise will contain all frequencies in different combinations, thus it cannot be reduced much further without noticeable signal loss. The new noise has a "burbley" or "bubbly" quality to it, and if amplified, sounds very harmonic--like those 1960's computers in old science fiction films. Since this is so much quieter than the original noise though, it is very acceptable.

Great effects can be generated by setting the noise level to some valid signal component in the waveform, and not the background noise. Whatever frequencies are present in the highlighted selection when **Set Noise Level** is chosen will be removed when the reduction level is set to 100.

Use this function to remove tape hiss, microphone background noise, 60 cycle hum, or any noise that is constant throughout the duration of your waveform. You can even reduce the noise incurred by the sound board's circuitry during recording--just record a second of silence before whatever you want to record and tell the noise reducer to remove the sound of that silence for another 10dB dynamic range.

Save Profile
Once the noise level is set, you can save the noise profile in a *.fft file. This file will contain information on sample type, FFT size, and three sets of FFT coefficients, one for the lowest amount of noise found, one for the highest amount, and one for the power average.

Load Profile
Loads any previously saved noise profile. You can load any *.fft file that Cool Edit has saved. Eventually the spectrum analyzer and Filter functions will support *.fft files. A noise profile is only compatible if it is being used on a sample of the same type when the profile was saved. In other words, a 44K stereo 8-bit sample is not compatible with a 22 KHz mono 16-bit profile. Also, since noise profiles are so specific to

the recording environment of waveform in question, even if the sample types are compatible, a profile for one type of noise will not work on another type. Even if the audio samples were recorded with the same microphone, if the recording environment is different, the type of background noise could be different.

FFT and STATISTICAL SAMPLING settings

These settings will affect the noise reduction quality, and the type of distortion heard when reducing the noise. Try different settings to get the best noise reduction while keeping the intended signal in tact. The **FFT Size** parameter causes the most drastic changes in quality. Good settings for the size range from 4096 to 12000. The **FFT Precision Factor** affects distortions in amplitude. With values of 3 or less, the FFT is performed in giant blocks that are not very continuous between the blocks. This means after each block is processed, there can be a drop or spike in volume at the interval between blocks. Values of 5 and up work best. On past about 10, there is no noticeable change in quality - just the time it takes to compute. We suggest using 5 or 7 (odd numbers are best for symmetric properties). The **Number of Samples** can be chosen for the gathering of statistical data. This number describes how many snapshots of noise to take in the highlighted interval when Set Noise Level is pressed. The larger this number, the more accurate the statistical data is. A value of 64 is plenty. You will notice that using very small numbers of statistical samples will greatly affect the quality of the various noise reduction levels. With more samples, a noise reduction level of 100 will most likely cut out more noise, but also cut out more original signal too., But, with more samples, a low noise reduction level will also cut out more noise, but most likely *not* disrupt the intended signal. If the selection used for learning the noise level is too small, then the Set Noise Level button will not activate. It is possible to make a larger section of noise by using Copy and Paste for reasonable results with very short noise samplings.

Special Notes

Noise reduction works best on 16-bit samples, although it will work perfectly on 8-bit samples. Because of the nature of 8-bit audio, it is impossible to get the noise level to less than about -45dB if even that. Noise at -45dB is very audible, as owners of 8-bit sound cards can attest. Converting to 16-bit first, then reducing the noise will produce a sample with much less noise than can be done in 8-bit alone.

The noise reduction works best if the original signal is centered. To center a signal, highlight it and choose "Center Wave" from the Amplify function. Centering the wave adjusts the DC offset to zero. If the wave is not centered, audible clicking may be heard in really quiet situations. Since centering takes out all frequencies below about 16Hz, it is completely safe to do without any ill side effects.

Normalize

Normalize will amplify the highlighted selection so it is the desired percentage of maximum. Optionally, a DC Bias can be set. Setting a DC Bias to zero will ensure that the waveform is centered on the zero voltage line.

Use this normalize function if you are recording a script in which you want to normalize a waveform to a specific percentage of maximum. After normalizing to a specified level, pressing the F3 key will automatically run Normalize again on another waveform for very fast normalization of waves.

Reverb

This function creates high quality reverberation effects. Use this function when you are looking to reproduce the effects of a certain environment - everything from your coat closet to a grand amphitheatre. Unlike echo, which generates specific echoes at specific times, the reverb function creates a very much spread out, random phase trailing of the original audio and no specific echoes can be heard at any particular time. The effect is very warm and natural. To simulate specific rooms that have echoes and reverb, use the Echo function first to get the 'size' of the room sound, then use Reverb to make it sound more natural. This function is ideal for converting Mono audio to sound as if it is Stereo. Converting a Mono sample to stereo where both the left and right channels are identical should be used as the source, then by adding some reverb, even as little as 300ms, will open up the sound so it is perceived of as being in true stereo.

Total Reverb Length
This is the total length of the reverberation. The signal will trail off and finally cut out at about -96dB after this amount of time. Values below 400 produce a small room environment. Values between 400 and 800 simulate medium sized rooms, and values above 800 simulate concert halls up to giant amphitheatres at delays around 3000 ms.

Attack Time
The amount of time it takes for the reverb to gain full strength is known as the attack time. For smaller reverb lengths, the attack time should be smaller. In general, a value of about 10% the total reverb length works well. But interesting effects can be gained by using longer attack times with shorter reverb lengths for very subtle reverb. Or, very short attack times can be coupled with long reverb lengths for other special effects.

High Frequency Absorption Time
In natural environments, higher frequencies are attenuated more than lower frequencies. Using this parameter, the exact time it takes for the highest frequencies to be completely cut out can be chosen. Faster Absorption times simulate rooms that are occupied and have furniture and carpeting like night clubs or theatres. Slower times (especially over 1000ms) simulate more empty rooms, like gymnasiums and empty auditoriums, where higher frequency reflections can be heard.

Perception / Timbre
This is another parameter to help give subtle qualities to the environment making it sound more realistic. It can be thought of as changing the width of the room and adjusting other room irregularities. With lower values, the reverb is smoother without as many distinct 'echoes'. Higher values cause more variation in the reverb amplitudes and add more spaciousness to the reverb by creating distinct reflections over time. In general, higher values (up to 60%) can be used for simulating large rooms, and lower values (down to 0%) for small rooms. But these are only suggestions. Interesting canyon effects can be created by setting this value to 100, and using a total reverb length of 2000 or more.

Mixing - Original Signal
This is the amount to mix the original signal into the final result. If you are trying to achieve some special effects with reverb, you may want to reduce the volume of the original signal. Or, if the reverb is so great that audio begins to clip, reduce both the original signal and the reverb mixing strength. In general, the more reverb you add, the lower the original signal volume should be. In most cases, a value of 90% or so should be fine.

Mixing - Reverb
This is the amount to mix the reverberated signal into the final result. A value of 100% is most natural, but you may wish to decrease this for a reverb that exists more in the background, or increase to simulate being far away from the audio source where only the reverb can be heard in greater strength than the

original audio.

Combine L&R
In general, this should be checked for more realistic reverb, and faster calculation times. When checked, the left and right channels in a stereo source are combined before reverb is performed. This should especially be checked if you know that both channels are identical, otherwise it is just a waste of computer time. When Combine L&R is not checked, separate stereo reverb is calculated for each channel individually. The original signal will remain in the respective channels, but the reverb will carry through to both channels equally. With stereo audio where there is different information in the left and right channels, this box should not be checked. The stereo audio will be dramatically enhanced by the reverb, and sound fuller and more rich in most instances. Also, when this box is not checked, calculations take exactly twice as long to compute, since separate reverb is being calculated for the left and right channels before being recombined to the final stereo output.

We have built a few presets to get you started. But for best results, experiment with the different parameters and you'll find just the reverb you are looking for. The "Large Occupied Hall" gives a very nice live theatre atmosphere. The "Concert Hall Light" setting gives a nice professional performance reverb, enhancing a non-reverberated vocal singing track quite nicely.

This function supports Presets.

Stretch

You can choose the initial stretching percent (less than 100% will compress the wave), and the final stretching percent. By having two separate values for start and end, the wave can be stretched linearly from one ratio to another. This gives the effect of slowing down and speeding up, or raising and lowering pitch.

Preserve Pitch
Lower percentages will slow down the tempo, while higher ones will increase the tempo. The pitch remains the same throughout.

Preserve Tempo
The tempo or speed of play will remain the same. The only thing affected will be the pitch. Higher percentages will lower the pitch, and lower percentages will increase the pitch. Try using differing initial and final percentages to raise and lower the pitch without affecting the tempo. First the selection is adjusted, preserving the pitch, then the selection is squeezed or expanded, with no preservation.

Preserve None
The tempo will slow, while at the same time the pitch will lower if percentages above 100 are used. For lower percentages, the tempo will speed up and the pitch will increase.

Ratio, Length
The desired Ratio or final Length can be entered. Entering one automatically changes the other. If the initial and final lengths are different, then the actual final length will be exactly (initial + final) / 2 when in Preserve Pitch mode.

Transpose
When the number of desired keys up or down are chosen, the numerical values for transposing musically are entered into the stretch sliders. For example, to make your sound as if it were the next key higher (if played on a keyboard, and black keys included) choose 1# for 1 sharp. The 'b' values will flatten or lower your sound.

Interval Overlap
When preserving pitch or tempo, the waveform must be elongated or truncated smoothly and preserve as much of the original information without adding noticeable distortion. This is one of two methods that can be used to achieve this. The amount of distortion introduced is not dependent on the type of sample (e.g. music or speech). When stretching or compressing, the appropriate chunk from the original wave is output to the transformed wave, and overlapped with the previously transformed chunk.

The **interval rate** determines the size of a 'chunk' of audio data. Interval rates will become an audible *hollow* sound when large rates (above 50Hz) are used. If the rate is too low, echoing will be very noticeable when raising pitch, or slowing down tempo, or chopped syllables will be noticeable when lowering pitch, or speeding up tempo. Values of 20Hz to 40Hz usually produce good results.

The **overlapping** determines how much of the previous chunk is overlapped with the current chunk. The overlapping can produce a *chorus* effect. To reduce the chorus effect, lower the overlapping percentage. When the overlapping is reduced, a *choppiness* to the sound may appear. Adjust the overlapping to your taste to strike a balance between choppiness and chorusing. Overlapping can be as high as about 400%, but only use this for really high speed increases (like 200% or more).

Fractional Interval Overlap
This second method of preserving pitch or tempo uses a more straightforward algorithm which guarantees the timing to be as close as the interval rate allows. This usually causes more of a

reverb/echo effect with the audio, but in cases where stretching is being done at rates lower than 60 percent, or higher than 175 percent, this method can produce more desirable results..

The **interval rate** determines the size of the chunk of audio data in the final stretched wave. If there are any artifacts, they will be heard at this frequency. For example, an interval rate of 60Hz will cause a 60Hz distortion artifact. Values of 15 down to 7 or so seem to work best. The higher the value, the more precise the placement of stretched audio over time, but also the artifacts are more noticeable as rates go up.

The **overlapping** determines how much the current chunk overlaps with the previous and next chunks. The maximum overlapping allowed can be as great as 1000%, in which up to 10 sections of the wave are overlapped together.

If using either of the Interval Overlap methods, you can improve the quality of the stretched audio of mono tonal (pure tone) samples by choosing an Interval Rate that is evenly divisible into the frequency of the sample. Use the Frequency Analysis window to find the sample's base frequency, then divide by an integer to get the Interval Rate. For example, if the tone was reported to be 438Hz, dividing by 20 gives 21.9Hz, so using 21.9Hz for the Interval Rate will greatly improve the quality by reducing the phasing artifacts. For very non-tonal or noisy samples, the Interval Rate does not matter as much.

Zero Splicing
This is the third method of preserving pitch or tempo. Less distortion is noticed when using samples that were derived from one source, and contain a relatively low number of fundamental frequencies. For example, a single instrument, or speech will work OK, while an orchestra or music will not work as well. When stretching or compressing, the wave is broken up into chunks that begin and end when the waveform crosses zero, or the midpoint. Chunks are repeated, or thrown out depending on the compression ratio and the cutoff frequency. Chunks smaller than the **cutoff frequency** will not be thrown out or repeated. Try cutoff frequencies between 50Hz and 300Hz for best results using this method.

This function supports Presets.

Raise Pitch Preset
This will adjust the settings so that the pitch of the sample will be raised by 1/4 octave.

Lower Pitch Preset
This will adjust the settings so that the pitch will be lowered by 1/4 octave.

Speed Up Preset
This will speed up the sample, so talking will be faster, but the pitch will be unaffected.

Slow Down Preset
Slows down the sample.

Note: An alternative method of stretching while preserving pitch or tempo is to do an FFT, and modify the amplitudes and phases of each frequency in the frequency domain, and then do the inverse FFT to translate back. This method would be very complex, and be very very much slower than the methods currently being used. If you want to experiment some, try the /i Shift option in the Filter function does this in a very crude way, by just shifting the frequencies up without regard to their phase.

Wave (Brainwave Synchronizer)

Audio may be Waved to produce files, that when listened to with stereo headphones, will put the listener into any desired state of awareness. For example, by listening to waved files, you can easily achieve states such as deep sleep, theta meditation, or alpha relaxation. Because of the nature of this function, it only works on **Stereo** waveform data, and to be effective, must be listened to with stereo headphones. The Wave function spatially locates the audio left and right, in a circular pattern over time. In order to spatially encode the signal, either the left or right channel is delayed so that the sounds will appear at each ear at different times, tricking the brain into thinking they are coming from either side. When this is done at frequencies of 3Hz and above, the brain will start synchronizing at the same frequency, increasing its output of Delta, Theta, Alpha, or Beta frequencies.

LOW SETTINGS
These settings all correspond to the lower part of the graph. If points are dragged to near the bottom of the graph, these settings will be active.

HIGH SETTINGS
And these settings correspond to points near the top of the graph.

Frequency Graph
Time is represented along the horizontal, so as you go to the right of the graph, you are setting the frequency characteristics of the highlighted sample later and later in time. The settings chosen will vary between the low settings and high settings depending on where the graph dictates the signals should be.

Click on the graph to add new control points. Drag a control point up or down, or off the screen to remove. Choose the highest and lowest frequencies that are represented on the graph with the scroll bars. Gliding about 4 to 5 Hz over 2 minutes works nicely. If large variations are done in short time spans, the effects are not as pronounced. For example, after 5 minutes of Theta waves, if 30 seconds of alpha waves are generated, and returned to theta, the listener will become slightly awake, and aware of his surroundings for that brief moment. The effect is like all of the sudden changing gears, and you stop thinking about whatever it was you were thinking about, and become aware that you were thinking about it, but aren't any more.

Frequency
This is the brainwave frequency that will be encoded. Different brainwave frequencies will stimulate the brain to sync to differing levels of consciousness (e.g. sleep, meditation, awakeness, etc.). See the bottom of this article for more information on specific frequencies.

Intensity
This is the intensity of the brainwave encoding. Higher intensities work well with lower brainwave frequencies. Beta waves should have intensities below 25 or so, while Delta waves work better with intensities above 60.

Centering
You may choose to have your brain think the synchronization frequencies are coming from the left or right. This may affect the left or right hemispheres more intensely, but that's only a guess. Mixing a file that has been waved to the left with one that has been waved to the right (in the same frequency range within 2 Hz) has interesting effects.

Musical Source
If the selection being waved is musical, checking this will calculate the wave patterns in such a way as to eliminate clicks and pops. If the source is noisy (waterfall, ocean, nature recordings, etc.) do NOT check this. If you do, it will actually add interference. Since noise is based on "randomness", the clicks and

pops are inaudible.

Smooth Wave
When checked, the actual audio appearing at the left and right channels is smoothed out, but the spatial encoding is identical. The left and right channels will delay and un-delay following a smooth curve such that the delay difference between the left and right channels follows a sine wave, and the brain will hear the audio traveling around the head in a circle. When Smooth Wave is not checked, the net delays are the same, but are achieved by holding one channel constant (at no delay) while the other channel is delayed following half a sine wave. Then the other channel is delayed while the first is held constant. The boundary between holding constant and delaying is discontinuous in that the dD/dt (difference in delay over time) jumps from zero to a positive delay value without hitting any values in-between. When Smooth Wave is checked, the dD/dt is always continuous. This will also cause less noticeable distortion in either channel when heard independently.

For special spatial panning effects, choose wave frequencies of 1Hz or less. A mono source (left and right the same) will appear to move from left to right and back at period of 1/frequency. For example, a frequency of 0.1Hz will pan the audio in a "full circle" over the period of 10 seconds.

Please read on for more information about Brainwave Synchronization Files

The major brainwave patterns are:

Beta	> 13 hz	Normal state of alertness, stress and anxiety.
Alpha	8-12 hz	Light relaxation, "superlearning", positive thinking.
Theta	4-7 hz	Deep relaxation, meditation, increased memory and focus.
Delta	1-3 hz	Deep sleep, lucid dreaming, increased immune functions.
Gamma	200+ hz	Not sure exactly what these do...

About Brainwave Files

The wave option works like many meditation tapes and light/sound devices on the market, which range in price from $200 to $500. There's even a board available with plug in glasses (which have blinking lights) for your PC for $495. The files created using the 'Wave' transformation are even more powerful, and are definitely more pleasing to the ears. Most other devices and tapes have a "humming" sound or some other tones to induce the right brainwave frequencies. This program allows you to use ANY sound to encode the frequencies with. The most effective we have found are by using the noise generator, which creates pleasing waterfall like sounds. This function only works on **stereo** waveforms, and the effects work if only if listened to with **stereo headphones**.

There are four major (perhaps more) Brainwave Patterns ranging from deep sleep to acute awareness. Listening to sounds that have been waved for periods of 5 minutes or more will produce the desired state of awareness in the listener. Sessions of 25 minutes or so work really well!

WARNING
Sounds generated by the wave function are not suitable for epileptics or persons undergoing psychiatric treatment since it *does* alter one's state of consciousness.

Noise Generator

This function generates random noise in a variety of colors. Each color has its own characteristics. One use for generating noise is to create a waterfall-like sound which is ideal for Waving. It is also great for making weird effects by flanging and equalizing.

Color

Noise can be a variety of colors, which describe its spectral composition.

Brown noise has a spectral frequency of 1/f^2. Which means, in English, that there is much more low-end, low-frequency components to the noise, which results in thunder and waterfall like sounds. Brown noise is called that because, when viewed, the wave follows a Brownian motion curve. That is, the next sample in the waveform is equal to the previous sample, plus a small random amount. This gives the appearance of a mountain range when graphed. The wave pattern is very predictable.

Pink noise has a spectral frequency of 1/f and is found mostly in nature. It is the most natural sounding of the noises. By equalizing, rainfall, waterfalls, wind, rushing river, and other natural sounds can be generated. Pink noise is exactly between brown and white noise (which is why some people used to call it tan noise, but pink was more appealing). It is neither random, nor predictable. It has a fractal like nature when viewed. When zoomed in, the pattern looks identical to when zoomed out, except at a lower amplitude.

White noise has a spectral frequency of 1. In other words, equal proportions of all frequencies are present. Because the human ear is more susceptible to high frequencies, it sounds very "hissy". White noise is generated by choosing random values for each sample.

Style

Noise can be generated in a variety of styles for your listening pleasure.

Spatial Stereo noise is noise generated by using 3 unique noise sources, and spatially encoding them to appear as if one is coming from the left, the other from the center, and the last from the right. When listened to with stereo headphones, the mind perceives sound coming from all around, not just in the center. To choose the distance from center of the left and right noise sources, you can enter a delay value in microseconds. About 900 to 1000 microseconds corresponds to the maximum delay perceivable, and a delay of zero is identical to Mono noise (left and right channels are the same).

Independent Channels noise is generated by using 2 unique noise sources, one for each channel. The left channel's noise is completely independent of the right channel's noise.

Mono noise is generated by using 1 noise source, with the left and right channels set equal to the same noise source.

Inverse noise is generated by using 1 noise source as well, but this time with the left channel's noise exactly inverse of the right channel's noise. When listened to with stereo headphones, the effect is that of the sound coming from the center of the listener's head instead of out in space somewhere.

Intensity

With higher intensities, the noise becomes more erratic, and sounds harsher and louder.

Duration

This is the number of seconds of noise to generate. If long periods of noise are desired, it is faster to generate a short period of noise (about 10 to 20 seconds), delete excess noise at the beginning and

ending of the noise so that the waves are starting and ending at the midpoint, copy, then loop paste as many times as needed.

If a selection range is highlighted, it is **not** replaced by the noise generated. Noise gets inserted at the insertion point represented by the yellow arrows.

Many Uses / Effects of Using

Immediate Relaxation and Stress Relief
Choose between 5hz and 10 hz for different levels of relaxation.
Meditation
Choose between 4hz and 7hz, either cycle between a few, or stay at a particular frequency for different results.
Improved Sleeping Patterns
Any of the Alpha and Theta frequencies (8Hz to 4Hz) for 30-45 minute sessions.
Treatment of Insomnia
Choose between 4hz and 6hz for starters (1/2 hour), then go into frequencies below 3.5hz (1/2 hour), settling on about 1.5hz to 2.5hz for sleep.
Improved and Lasting Sense of Well Being
Try Theta (4Hz to 7Hz) for 45 minutes, daily.
Creative Visualization
About 6hz for a while, then up to 10hz works well.
Alleviation of Migraines and Headaches
Experiment with Alpha and Theta combinations.
Reduction of Depression Symptoms
Again, Alpha and Theta combinations, mostly theta(?)
Self Hypnosis
Choose about 8hz to 10hz while playing any self-hypnosis tape, or guided meditation.
Super Learning
Choose about 7hz to 9hz while playing any learning tapes, like foreign language tapes, etc. to increase comprehension.
Subliminal Programming
Choose 5hz to 7hz while playing your favorite subliminal tapes, or make your own by recording some affirmations, and mix paste them from the clipboard at barely audible volumes.
Improve ESP / Intuition
Theta frequencies help in this area, 4hz to 7hz.
Reaching Higher States of Consciousness
Theta again, with daily half hour sessions.
Quick Refresher on long days
Low Alpha 8hz to 10hz for about 15 minutes works well.
Increased Immune System
Relaxing to Alpha and Theta combinations daily.

Using Alpha Synchronization (8Hz to 12Hz), expect similar increases in neuro-chemical levels:

- 11% increase in Norepinephrin levels
- 21% increase in Serotonin levels
- 25% increase in Beta-Endorphin levels

- Cambiar las aplicaciones de APT para:
  - Ofertapi
  - Aspirantes
  - Respuestas

About Carrier Waves

A carrier wave is needed to transport the brainwave frequencies. Because the carrier wave is not what you hear through the headphones directly, you do not need to buy super high-end headphones (5Hz-25KHz) to reproduce the effects. In other words, your headphones do not need to be able to reproduce a 5Hz signal if you are generating a 5Hz theta-frequency brainwave file. The brain *does* however respond better to the lower frequencies, so the better the headphones you buy, the more dramatic the results will be. The best headphones are the kind that cover the entire ear, so outside noise does not get in. Plus, these headphones have much higher response to low frequencies.

Carrier waves must have some correlation between the left and right channels, no matter how slight. So mono (total correlation), inverse (total negative correlation), and spatial (natural recordings that have some of the same sounds coming in both channels) will work great.

The best sounds to use as carriers are sounds that are spread across the entire frequency range, or at least most of the lower frequency range. Good examples are ocean, waterfall (most any recordings from nature), and noise generated by this program. Experiment with mono (both left and right channels the same), inverted (like mono, but the left channel is the inverse of the right, obtained by using the Channel Mixer), and spatial stereo (spatially encoded sounds in nature, recorded with microphones about 9 inches apart to simulate separation between the ears). But don't let this stop you from digitizing your favorite music, and using it as a carrier, or converting your favorite to a mono or inverted wave.

To generate a carrier wave, you can do three things:

Record a sample Once recorded, use the Channel Mixer to create a mono, or inversed wave. Or just leave it the way it was recorded. You may find changes in effectiveness of the brainwave files depending on how you use the Channel Mixer. Keep in mind that this function only operates on stereo waves, so when "mono" is mentioned, it means that the exact same signal is present on both channels--the left channel and right channel are the same.

Generate Tones You may use the Generate Tones function to find a pleasing, relaxing tone for the background (but we find "noise" sounds more relaxing). The way tones work the best is if the left channel's tone frequency is 5-6 Hz different from the right channel's tone. This creates a beat pattern equal to the frequency difference, which the brain responds to somewhat (this is the property that many theta-inducers rely on). To do this, generate one tone with left volume at 40, and right volume at zero. Then generate the second tone with the left and right volumes reversed. Finally, Paste Special (with overlap) one tone on top of the other. Use low frequency tones, like 50Hz to 120Hz for best results. These tones, by themselves, will help coerce the mind into the state associated with the difference between the frequencies. For example, for a theta state of 6Hz, use a 70Hz and a 76Hz tone. Combining this tones sample with an existing brainwave file, by overlap pasting at a quiet volume (20%) is even more effective.

Generate Noise Use the Generate Noise function (pink and brown work best) in any of the modes: mono, inverse, or spatial stereo (independent channels noise will **not** work as a carrier for brainwave frequencies at all, since there is no correlation between the left and right channels). We find that using pink noise in spatial stereo, and running it through the Quick Filter to get rid off some of the "edge" if any works the best. We have also found Inverse to work quite well too, but the brainwave "effect" is more pronounced, and can be distracting, and some sound boards have trouble reproducing sound that is inversed between channels.

Once you have found a pleasing sound, about 10 seconds or so of a monotonous sound (tones, river, waterfall, noise...) you're ready to start. If a monotonous sound is used, more disk space can be saved because we will use the play list to repeat portions. If a music sample were used, it is quite noticeable

that the same 10-second piece is being played over and over and over again.

If you're curious you can also spatially locate a mono sound to the left or right?. Do this if you wish to have the illusion that a particular sound is coming from one side or the other. The function works by pasting a mono sound sample into a stereo waveform, and using the Digital Delay function. Having a quiet "ping" (generated by using the sine wave tone generator with the bell curve envelope) play spatially on the left, then on the right at about 5 second intervals is very relaxing.

Spatial Location

Spatially locating a mono sound makes the sound appear as if it is coming from the left or the right when listened to with stereo headphones, even though the actual volume levels for left and right of the wave are identical. What happens is one channel is delayed a few milliseconds. When a sound reaches one ear a few milliseconds before reaching the other ear, the brain interprets the delay as hearing the sound coming from the direction of the non-delayed signal.

There are two functions that can do this: **Delay** and **Wave**. Use **Delay** to place a sound anywhere from left to right, and **Wave** if you wish to have the sound source oscillate between left and right.

- First make sure the signal to be delayed is mono in stereo format. That is, both left and right channels are identical. With a mono source, copy the wave, create a new stereo wave, and paste. With a stereo source, use the channel mixer so that both channels get mixed at 50% for each channel.
- Highlight the entire selection you wish to spatially locate. Choose **Transform -> Delay** or click the stopwatch icon. Choose a delay of up to 2 ms. Delaying one channel will make the sound appear as if it is coming from the other channel. You can use the preset for Spatial Left or Spatial Right as well.
- If you want the source to move left to right, choose the **Transform -> Wave** function. Enter the cycles per second (e.g. 0.1 = left to right and back in 10 seconds) in the initial and final boxes (the same value for both boxes). Choose the center position (in the center, left, or right) using the Centering control. Choose an intensity of about 50 or so, greater intensities mean the sound goes further left or right off of center. Also check the Musical Source box if your sound is not noise related.

Encoding Brainwave Information

There are two types of brainwave files that you can create: **A flat file, and a cued file**. The flat file takes more memory, and plays straight through from beginning to end, while the cued file is actually contains pieces of the entire audio program, that when played in the proper order become the brainwave file. The cued file takes less memory, and can very quickly be modified at any time by re-arranging the audio pieces. The average length of a cued file is about 3-4 minutes for a program that can last as long as desired. The flat file is a standard wave file, which means to create a long program, you must have enough space for it. The only advantage to using a flat file is if you are waving music, since music cannot be split into pieces and re-arranged, otherwise it would sound discontinuous. Creating brainwave files using the flat file method will be discussed first, since it is more straightforward

Flat Brainwave File Generation Create a file the length you wish to make your relaxation program using the carrier wave(s) of your choice. Either record music, or use the pink noise generator and copy and paste (or Paste Special) to the desired length. If you are using a monotonous sound, you would be better off using the cued file method. Lengths of good relaxation programs vary from 15 to 30 minutes, and beyond. This means you must have enough hard drive space for the entire file. Since the temporary file takes up hard drive space as well, the maximum size of file you can create, and be able to save, will be one that takes up half of the initial free hard drive space.

Use the Wave function to encode the brainwave patterns into the carrier wave by highlighting a section of the wave, or the whole thing, and choosing Transform:Wave, or click the wave icon. With the wave transformation, you have complete control over the brainwave frequency being encoded, the strength of the signal, and the positioning of the signal left or right. Over the selection highlighted, the intensity, and position remain constant, but the frequency can be varied using the graphical input control. See the section on Authoring Brainwave Files to learn what settings to use for the Wave function, and how to build effective files.

Once the entire file has been waved to your satisfaction, you can save the file if you wish, and play it using the Play button. An interesting side effect is that different sounds are heard if you listen to one channel, listen to both channels with one ear, or listen to each channel with each ear.

Cued Brainwave File Generation These files contain many short snippets of brainwave encodings at different frequencies. Each snippet is cued using the Cue List, and a Play List is generated by adding entries from the Cue List, and looping them if necessary. To listen to a cued brainwave file, you must use the Play button in the Play List dialog box.

First you must figure out how you want to divide up the brainwave program (your 20-30 minute masterpiece) into components. For example, you may want to have patterns of 5Hz, 7Hz, and 9Hz at different points in the program. In this case, you will need at least three pieces for your creation. The actual file will just be 10 seconds of carrier wave at 5Hz, followed by 10 seconds at 7hz, followed by 10 seconds at 9Hz. All the pieces are placed in the cue list by highlighting the piece, and choosing **Add**. It is best to add the piece to the cue list once it is created, or pasted at the end of the current waveform. To create the final program, the pieces are added to the Play List in the order you wish to listen to them. Each piece can be looped if needed. So a 20 minute program can be generated from 3 10-second pieces by adding the cues to the play list and looping.

First you need to create 10 to 20 seconds of carrier wave, and save in a special file in case you need the carrier wave again later. Highlight the wave, and Edit:Copy. When you need another copy of the initial carrier wave, you need only to Paste it.

Add the first carrier wave snippet to the Cue List by pressing the **Add** button in the Cue List dialog. Give the cue for this snippet a name that reflects the waveform transformation you will be using, for example,

"6Hz to 5Hz drop".

Choose the **Transform:Wave** function to encode the proper patterns into the carrier wave. Look at the section on Authoring Brainwave Files to learn what settings to choose.

Click past the end of the wave file (make sure the rightmost part of the file is in view), and choose Paste to insert another copy of the carrier wave. Once you do this, you can add the newly inserted selection to the cue list, and give it a name. Repeat the step above for creating a brainwave encoding over the carrier wave you just inserted. Do this as many times as needed until you have all the pieces you need to build the final brainwave file.

Once all the pieces have been generated, add them in the order you like to the play list. To make pieces last longer (if the beginning and ending of the piece are at the same brainwave frequency), increase the number of loops for that entry in the play list.

When Played from the play list, the pieces will be played in the order shown, and looped if necessary.

To get familiar with the cue list, and play list, open one of your favorite wave files, and highlight sections then add them to the cue list. After you have a few selections in the cue list, add them to the play list, and choose a loop count of greater than one for some of them. Choose Play from the play list, and listen to what you've just created.

Authoring Brainwave Files

After learning about carrier waves, and encoding procedures, all you need to know is what frequencies to use, and when to use them during the course of the listening session. Once you know what frequencies to use, and at what intensity, you can generate the completed file using either of the methods above.

Effective brainwave files have some sort of encoding going on the entire length of the session. For the first 3 minutes or so of the session, the listener will not be in a "relaxed" state, and will not respond greatly to the frequencies being presented. During this *warm-up* period, gradually decreasing from about 12Hz down to 8Hz works nicely. After about 4 minutes, the listener's brainwave patterns will start to synchronize with the patterns in the headphones, and the serious brainwave programming can begin.

Frequencies of 8-10Hz correspond to an alpha state – light relaxation, like a quick afternoon siesta. Frequencies of 6-7Hz correspond to a theta state – meditation. 4-5Hz correspond to deep relaxation. You can create a session that is constant, in one of these states, or create a session that dynamically flows from one to the other. When going down in frequency, give the listener about one minute to "catch up", and stay in sync with the wave. Going up in frequency does not require the listener to catch up. In other words, if you go from 6Hz down to 4Hz over a 20 second time span, and hold at 4Hz, the listener may not be at 4Hz for another minute. When going from 4Hz to 8Hz in 20 seconds, the listener will be at 8Hz at the end of the 20 seconds. It appears to take extra time when going down in frequency, but no extra time when going up. This basically holds true for the first 20-30 minutes of a session. After that, the opposite tends to occur. It is easier to go lower than go higher. This means that to bring a listener from 4Hz (where she has been for the last 30 minutes) up to 12 Hz, it should be done over a 5 minute period or so. One nice "trick" to do is to keep the listener at around 4-5 Hz for a while, then about once every 2 minutes, go up to 8Hz and back over a 20 second span. This will *alert* the listener slightly, and make them aware for a few seconds of what they are thinking. This is great for getting creative insights and the like. It acts as a sort of *window* to the subconscious, allowing one to remember what is going on. It's kind of like remembering dreams: you do it better if you are awaken in the middle of one.

Another effective method of producing relaxation files is to overlap them. That is, have portions that are one frequency, and slightly spatially located to one side overlapped with a slightly differing frequency spatially located slightly to the other side. This gives the listener the chance to *decide* which frequency to be at, and gives them more freedom over the experience. For example, a session could go from 8Hz to 4Hz over 10 minutes overlapped with 7Hz to 5Hz over the same 10 minutes.

For nice *super-relaxing* effects, generate panning waves (frequencies of 0.05 to 0.2) over your session after encoding the initial brainwave patterns. For example, if you are generating a brainwave file out of 20-second pieces, after generating the main brainwave frequency over the 20 second period, generate a panning wave of 0.05 or 0.1 (which means a period of 20 or 10 seconds) with an intensity of about 50 or so. This will make the sound appear to shift left and right to the listener over a 20 or 10 second period. Now, overlapping a 24-second piece panned at 0.125 (8 second period) at 5Hz with a 0.167 (6 second period) at 6Hz will combine the practices of multiple frequencies with panning for an extremely super-natural effect!

Once you get started creating a few files, and see what the different frequency ranges do, you will become familiar with the different effects and how to generate just the effects you want.

Gamma frequencies of 200Hz or more seem to help in relaxation. This is an area you can experiment with. When generating frequencies above 40Hz or so, it is best to keep the intensity very low, like 7 or 8. The higher the frequency, the lower the intensity has to be, otherwise the encoding will overwrite itself and the signal will be lost.

Sample Theta File - Step-by-Step

1 Create a new blank file with **File:New**. Choose a **Stereo** file, either 8 or 16 bit and a 11025, 22050, or 44100 sampling rate. The final file size will be one of the following sizes listed below depending on your choice:

	11025	**22050**	**44100**
8-bit	2.6M	5.2M	10.5M
16-bit	5.2M	10.5M	21.2M

You must make sure you have enough memory for a file of this size, plus an additional meg for working space. If you plan on saving the file when you are done, you must have at least **twice** this amount of hard drive space available, since a temporary file is used instead of memory while working on the wave.

2 Choose **Generate:Noise**. Choose **Pink Spatial Stereo** for **15** seconds at an intensity of **3**. This is usually the longest portion of the generation of brainwave files. Because of this, it is advised that you save this piece of *noise* so that in generating future files, you can just load in this pre-calculated noise as a starting point.

3 Choose **Edit:Copy**. From now on, we will paste the noise in when we need it!

4 Make sure the noise is highlighted. If it is not, select all by double-clicking on the waveform until it is highlighted.

5 Choose **Add** in the Cue list, and give the entry a **Label** of **10Hz to 8Hz**, and a **Description** of **Warm-Up**.

6 Choose **Transform:Wave** to bring up the brainwave dialog box. Enter **10** for the **Highest Frequency** , and **8** for the **Lowest Frequency**, and an **Intensity** of **35**. On the graph above, click the leftmost dot, and drag it to the top of the graph. Click the rightmost dot, and drag it to the bottom of the graph. This will product a frequency encoded at 10Hz at the beginning, and glide down to 8Hz by the end. Choose **OK** to generate the encoding. This shouldn't take nearly as long as it did to generate the noise.

7 Click the mouse at the rightmost portion of the wave (just beyond the *black* waveform display area). When you do this, the yellow cursor arrows should be all the way to the right of the wave. You must always add new pattern blocks at the **end** of the current waveform.

8 Choose **Edit:Paste** to insert another copy of the original noise that we had copied originally.

9 Create the following pattern blocks as before (following the steps 5 to 8) ; except with the following values for the cue list and waveform transformation:

Label	**Description**	**Hi Freq.**	**Lo Freq.**	**Intensity**
8 Hz	Alpha	8	8	37
8 to 6Hz	Glide Down	8	6	38
6Hz	High Theta	6	6	40
6 to 5Hz	Deeper Theta	6	5	45
5Hz	Theta	5	5	50
5-8-5	Spike	8	5	50
	(Graph should look like an upside-down "V")			
5 to 12Hz	Awake	12	5	40

(Graph should go from left=lowest to right=highest)

10 Once all the blocks are generated, and in the cue list, Add the pieces to the play list by selecting the wave portion in the cue list and clicking **Add** in the play list. Select the pieces listed below in the order given. After doing so, select each item in the play list, and change the **Loops** for each so the final play list looks like this:

(1)	10 to 8Hz
(3)	8Hz
(1)	8 to 6Hz
(7)	6Hz
(1)	6 to 5Hz
(18)	5Hz
(1)	5-8-5
(12)	5Hz
(1)	5-8-5
(12)	5Hz
(1)	5-8-5
(12)	5Hz
(1)	5-8-5
(12)	5Hz
(1)	5 to 12Hz

When you choose **-Play-** from the play list, the sequence will be played in the order given, looping the number of times specified. This list gives a 21 minute theta session, with bursts into alpha at four points.

11 If you wish to save this piece, and have enough hard drive space, you can do it now. The wave is complete. Enjoy.

How To Use

Once you have created your brainwave file (15 minute files on up work best), loop play them for a longer listening time. Sessions of 15 minutes or more work best. It is best to listen to the sessions lying down in a quiet place where you will not be disturbed. If there is no place like this near your PC, it may be a good idea to record the session on tape and listen to it where you can be comfortable and relaxed. When you're fully comfortable, start the session, close your eyes, and let the magical sounds from Cool Edit do the work. Remember, this only works if you listen to the sounds with stereo headphones.

You may notice helicopter, or "washing" type noises moving around in your head. These sounds are actually created inside your head, and are not coming directly out of either channel from the sound board. It is this noise that is doing the work of helping your brainwaves get synchronized to the patterns you have chosen. When we have mixed two different (but similar in frequency ranges) brainwave files together, we have noticed a jet airplane noise moving slowly from left to right in the background. Some people don't hear these artifacts at all, while others hear them extremely well.

Another side effect is that of a wandering mind. When you use frequencies under 8hz, you may find yourself thinking of the strangest things. You may find that you are not thinking of anything in particular, and your thoughts become very interesting. The feeling is also "warm" and "happy" for some people. Others start recalling their favorite memories as a child, even some they thought they had forgotten forever!

After a session of 15 minutes or more, you may feel quite refreshed, light, airy, clear-headed, etc. Some claim that doing this for 30 minutes a day can result in subtle but great changes in your life. ESP experiences increase, and you may be able to reach new levels of awareness in your everyday life.

References on Brainwave Synchronization

Adams, H. B. (1965). A case utilizing sensory deprivation procedures. In L. P. Ullman & L. Krasner (Eds.), *Case Studies in Behavior Modification.* New York: Holt, Rinehart & Winston.

Adrian, E. D. & Yamagiwa, K. (1935). "The origin of the Berger Rhythm." *Brain*, 58, 323-351.

Atwater, F. H. (1988). "The Monroe Institute's Hemisync process: A Theoretical Perspective." Faber, Va: Monroe Institute.

Bandler, R. (1985). "Using Your Brain--For a Change." Moab, UT: Real People Press.

Barber, T. X. (1957). "Experiments in hypnosis." *Scientific American*, 196, 54-61.

Bremer, F. (1958a). "Physiology of the corpus callosum." Proceedings of the Association of Research on Nervous Disorders, 36, 424-448.

Bermer, F. (1958b). "Cerebral and cerebellar potentials." *Physiological Review*, 38, 357-388.

Brackopp, G. W. (1984). Review of research on Multi-Modal sensory stimulation with clinical implications and research proposals. Unpublished manuscript--see Hutchison (1986).

Budzynski, T. (1973). "Some applications of biofeedback-produced twilight states." In D. Shapiro, et al (Eds.), *Biofeedback and Self-Control*: 1972. Chicago: Aldine-Atherton.

Budzynski, T. H. (1976). "Biofeedback and the twilight states of consciousness." In G. E. Schwartz and D. Shapiro (Eds.), *Consciousness and Self-Regulation*, Vol. 1, New York: Plenum Press.

Budzynski, T. H. (1977). "Tuning in on the twilight zone." *Psychology Today*, August.

Budzynski, T. H. (1979). "Brain lateralization and biofeedback." In B. Shapin & T. Coly (Eds.), *Brain/Mind and Parapsychology.* New York: Parapsychology Foundation.

Budzynski, T. H. (1981). "Brain lateralization and rescripting." *Somatics*, 3, 1-10.

Budzynski, T. H. (1986). "Clinical applications of non-drug-induced states." In B. Wolman & M. Ullman (Eds.), *Handbook of States of Consciousness.* New York: Van Nostrand-Reinhold.

Budzynski, T. H. (1990) "Hemispheric asymmetry and REST." In Suefeld, P. Turner, J. W., Jr. & Fine, T. H. (Eds.), *Restricted Environmental Stimulation*, New York: Springer-Verlag.

Cade, C. M. & Coxhead, N. (1979) "The Awakened Mind: Biofeedback and the Development of Higher States of Consciousness." New York: Delacorte Press.

Cheek, D. (1976). "Short-term hypnotherapy for fragility using exploration of early life attitudes." *The American Journal of Clinical Hypnosis*, 18, 75-82.

Davidson, R. J., Ekman, P., Saron, C. D., Senulis, J. A., & Friesen, W. V. (1990). "Approach-withdrawal and cerebral asymmetry: Emotional expression and brain physiology." *Journal of Personality and Social Psychology*, 58, 330-341.

Deikman, A. (1969). "De-automatization and the mystic experience." In C. T. Tart (Ed.), *Altered States of Consciousness.* New York: John Wiley & Sons.

Deikman, A. (1971). "Bimodal consciousness." *Archives of General Psychiatry*, 25, 481-489.

Donker, D. N. J., Nijo, L., Storm Van Leeuwen, W. & Wienke, G. (1978). "Interhemispheric relationships of responses to sine wave modulated light in normal subjects and patients." *Electroencephalography and Clinical Neurophysiology*, 44, 479-489.

Evans, F. J., Gustafson, L. A., O'Connell, D. N., Orne, M. T. & Shor, R. E. (1966). "Response during sleep with intervening waking amnesia." *Science*, 152, 666-667.

Evans, F. J., Gustafson, L. A., O'Connell, D. N., Orne, M. T. & Shor, R. E. (1970). "Verbally-induced behavioral response during sleep." *Journal of Nervous and Mental Disease*, 1, 1-26.

Evans, C. & Richardson, P. H. (1988) "Improved recovery and reduced postoperative stay after therapeutic suggestions during gneeral anaesthetic." *Lancet*, 2, 491.

Felipe, A. (1965). "Attitude change during interrupted sleep." Unpublished doctoral dissertation. Yale University.

Foster, D. S. (1990) "EEG and subjective correlates of alpha frequency binaural beats stimulation combined with alpha biofeedback." Ann Arbor, MI: UMI, Order No. 9025506.

Foulkes, D. & Vogel, G. (1964). "Mental activity at sleep-onset." *Journal of Abnormal Psychology*, 70, 231-243.

Glicksohn, J. (1986). "Photic driving and altered states of consciousness: An exploratory study." *Imagination, Cognition and Personality*, 6, 167-182.

Green, E. E., Green, A. M. (1971).. "On the meaning of the transpersonal: Some metaphysical perspectives." *Journal of Transpersonal Psychology*, 3, 27-46.

Green, E. E., & Green, A. M. (1986). "Biofeedback and States of Consciousness." In B. B. Wolman & M. Ullman (Eds.). *Handbook of States of Consciousness*. New York: Van Nostrand Reinhold.

Harding, G. F. & Dimitrakoudi, M. (1977). "The visual evoked potential in photosensitive epilepsy." In J. E. Desmedt (Ed.), *Visual Evoked Potentials in Man: New Developments*. Oxford: Clarendon.

Henriques, J. B. & Davidson, R. J. (1990). "Regional brain electrical asymmetries discriminate between previously depressed and healthy control subjects." *Journal of Abnormal Psychology*, 99, 22-31.

Hoovey, Z. B., Heinemann, U. & Creutzfeldt, O. D. (1972). "Inter-hemispheric 'synchrony' of alpha waves." *Electroencephalography and Clinical Neurophysiology*, 32, 337-347.

Hutchison, M. (1986). *Megabrain*. New York: Beech Tree Books. William Morrow.

Hutchison, M. (1990). "Special issue on sound/light." *Megabrain Report:* Vol 1, No. 2.

Iamblichus. "The epistle of Porphyry to the Egyptian Anebo." In *Iamblichus on the Mysteries of the Egyptians, Chaldeans, and Assyrians*. Trans. by Taylor, T. London: B. Dobell, and Reeves & Turner, 1895.

Janet, P. (1889). *L'Automatisme Psychologique*. Paris: Alcan.

Koestler, A. (1981). *The Act of Creation*. London: Pan Books.

Kooi, K. A. (1971). *Fundamentals of Electroencephalography.* New York: Harper & Row.

Kubie, L. (1943). "The use of induced hypnagogic reveries in the recovery of repressed amnesic data." *Bull. Menninger Clinic*, 7, 172-182.

Lankton, S. R., & Lankton, C. H. (1983). *The Answer Within: A Clinical Framework of Ericksonian Hypnotherapy.* New York: Bruner/Mazel.

Leman, K. & Carlson, R. (1989). *Unlocking the Secrets of Your Childhood Memories.* Nashville: Thomas Nelson.

Lilly, J. C. (1972)). *Programming and Metaprogramming in the Human Biocomputer.* New York: Julian.

Lubar, J. F. (1989). "Electroencephalographic biofeedback and neurological applications." In J. V. Basmajian (Ed.), *Biofeedback: Principles and Practice*, New York: Williams & Wilkins.

Mavromatis, A. Hypnagogia: *The Unique State of Consciousness Between Wakefulness and Sleep.* New York: Routledge & Kegan Paul, 1987.

Miller, E. E. (1987). *Software for the Mind: How to program Your Mind for Optimum Health and Performance.* Berkeley, CA: Celestial Arts.

Moscu, K. I. & Vranceanu, M. (1970). "Quelques resultats concernant l'action differentielle des mots affectogenes et nonaffectogenes pendant le somneil naturel." In M. Bertini (Ed.), *Psicofisiologia del Sonno e del Sogno.* Milan: Editrice Vita e Pensiero.

Moses, R. A. (1970). *Adler's Physiology of the Eye: Clinical Applications.* St. Louis: Mosby.

Nemiah, J. C. (1984). *The unconscious and psychopathology.* In S., & Meichenbaum, D. New York: John Wlley & Sons, pp. 49-87.

Oster, G. (1973). "Auditory beats in the brain." *Scientific American*, 229, 94-102.

Peniston, E. G. & Kulkowski, P. J. (1989). "Alpha-Theta brainwave training and B-endorphin levels in alcoholics." *Alcoholism*, 13, 271-279.

Richardson, A. & McAndres, F. (1990) "The effects of photic stimulation and private self-consciousness on the complexity of visual imagination imagery." *British Journal of Psychology*, 81, 381-394.

Rossi, E. L. (1986). *The Psychobiology of Mind-Body Healing.* New York: W. W. Norton.

Rubin, F. (1968). (Ed.), *Current Research in Hypnopaedia.* London: MacDonald.

Rubin, F. (1970). "Learning and sleep." *Nature*, 226, 447.

Schacter, D. L. (1977). "EEG theta waves and psychological phenomena: A review and analysis." Psychology, 5, 47-82.

Schultz, J. & Luthe, W. (1959). *Autogenic Training: A Psychophysiological Approach in Psychotherapy.* New York: Grune & Stratton.

Sittenfeld, P., Budzynski, T. & Stoyva, J. (1976). "Differential shaping of EEG Theta rhythms." *Biofeedback and Self-Regulation*, 1, 31-45.

Stoyva, J. M. (1973), "Biofeedback techniques and the conditions for hallucinatory activity" In McGulgan, F. J. and Schoonover, R. (Eds), *The Psychophysiology of Thinking.* New York: Academic Press.

Svyandoshch, A. (1968). "The assimilation and memorization of speech during natural sleep." In F. Rubin (Ed.), *Current Research in Hypnopaedia.* London: MacDonald.

Swedenborg, E. *Rational Psychology.* Philadelphia: Swedenborg Scientific Association, 1950.

Tomarken, A. J., Davidson, R. J., & Henriques, J. B. (1990). "Resting frontal brain asymmetry predicts affective responses to films." *Journal of Personality and Social Psychology*, 59, 791-801.

Townsend, R. E. (1973). "A device for generation and presentation of modulated light stimuli." *Electroencephalography and Clinical Neurophysiology*, 34, 97-99.

Tucker, D. M. (1981). "Lateral brain function, emotion, and conceptualization." *Psychological Bulletin*, 89, 19-46.

Van der Tweel, L. H. & Verduyn Lunel, H. F. E. (1965). "Human visual responses to sinusoidally modulated light." *Electroencephalography and Clinical Neurology*, 18, 587-598.

Van Dusen, W. (1975). *The Presence of Other Worlds.* London: Wildwood House.

Walter, V. J. & Walter, W. G. (1949). "The central effects of rhythmic sensory stimulation." *Electroencephalography and Clinical Neurophysiology*, 1, 57-86.

Wickramasekera, I. E. (1988). *Clinical Behavioral Medicine: Some Concepts and Procedures.* New York: Plenum Press.

Noise Generator

This function generates random noise in a variety of colors. Each color has its own characteristics. One use for generating noise is to create a waterfall-like sound which is ideal for Waving. It is also great for making weird effects by flanging and equalizing.

Color

Noise can be a variety of colors, which describe its spectral composition.

Brown noise has a spectral frequency of 1/f^2. Which means, in English, that there is much more low-end, low-frequency components to the noise, which results in thunder and waterfall like sounds. Brown noise is called that because, when viewed, the wave follows a Brownian motion curve. That is, the next sample in the waveform is equal to the previous sample, plus a small random amount. This gives the appearance of a mountain range when graphed. The wave pattern is very predictable.

Pink noise has a spectral frequency of 1/f and is found mostly in nature. It is the most natural sounding of the noises. By equalizing, rainfall, waterfalls, wind, rushing river, and other natural sounds can be generated. Pink noise is exactly between brown and white noise (which is why some people used to call it tan noise, but pink was more appealing). It is neither random, nor predictable. It has a fractal like nature when viewed. When zoomed in, the pattern looks identical to when zoomed out, except at a lower amplitude.

White noise has a spectral frequency of 1. In other words, equal proportions of all frequencies are present. Because the human ear is more susceptible to high frequencies, it sounds very "hissy". White noise is generated by choosing random values for each sample.

Style

Noise can be generated in a variety of styles for your listening pleasure.

Spatial Stereo noise is noise generated by using 3 unique noise sources, and spatially encoding them to appear as if one is coming from the left, the other from the center, and the last from the right. When listened to with stereo headphones, the mind perceives sound coming from all around, not just in the center. To choose the distance from center of the left and right noise sources, you can enter a delay value in microseconds. About 900 to 1000 microseconds corresponds to the maximum delay perceivable, and a delay of zero is identical to Mono noise (left and right channels are the same).

Independent Channels noise is generated by using 2 unique noise sources, one for each channel. The left channel's noise is completely independent of the right channel's noise.

Mono noise is generated by using 1 noise source, with the left and right channels set equal to the same noise source.

Inverse noise is generated by using 1 noise source as well, but this time with the left channel's noise exactly inverse of the right channel's noise. When listened to with stereo headphones, the effect is that of the sound coming from the center of the listener's head instead of out in space somewhere.

Intensity

With higher intensities, the noise becomes more erratic, and sounds harsher and louder.

Duration

This is the number of seconds of noise to generate. If long periods of noise are desired, it is faster to generate a short period of noise (about 10 to 20 seconds), delete excess noise at the beginning and

ending of the noise so that the waves are starting and ending at the midpoint, copy, then loop paste as many times as needed.

If a selection range is highlighted, it is **not** replaced by the noise generated. Noise gets inserted at the insertion point represented by the yellow arrows.

Generate DTMF Signals

This function generates Dual Tone Multi-Frequency (DTMF) signals used for dialing telephone numbers over the PSTN. These signals are recommended internationally by the International Telegraph and Telephone Consultave Committee (CCITT) as the signals for push-button telephones. The DTMF signals generated by telephone push-button keypads are different from the Multi-Frequency (MF) tones generated by the telephone network to transmit information.

Dial String
Enter the *phone number* you wish to generate the tones for in this box. Other characters may be entered such as the '*' and the '#' symbols, as well as extra digits 'a', 'b', 'c', and 'd'. Entering the pause character (defined below) will insert a pause of the length defined.

Tone Time
All tones will last the milliseconds entered. The standard time for DTMF tones is 100ms.

Break Time
This is the number of milliseconds between successive tones.

Pause Time
This is the number of milliseconds to use for a pause (when the pause character is used in the string).

Pause Character
When this character is typed in the Dial String, it will be interpreted as a pause, and silence will be inserted for the duration of the Pause Time.

DTMF Signals
DTMF (normal push-button telephone type) signals will be generated using combinations of the frequencies 697Hz, 770Hz, 852Hz, 941Hz and 1209Hz, 1336Hz, 1477Hz, 1633Hz.

MF Signals (CCITT R1)
MF (internal to telephone networks) signals will be generated using paired combinations of the frequencies 700Hz, 900Hz, 1100Hz, 1300Hz, 1500Hz, and 1700Hz.

Amplitude
The volume level of the tones being generated, with 100% being maximum volume without clipping.

The presets in this function save everything, including the dial string. To see how effective these tones are, try typing in your favorite phone number to generate the tones for it. Then hold the receiver of your phone next to the speaker and play the wave. It will dial the number you had entered!

Options menu

The Options menu displays various additional options.

Options Menu Options:

- **Loop / Play Toggle**
- **Monitor VU Level**
- **Info...**
- **Frequency Analysis...**
- **CD Player**
- **Cue List**
- **Play List**
- **Cool Scripts...**
- **Select Wave Device**
- **Custom Toolbar Settings...**
- **Settings...**

Anexo D)

Herramientas de edición de audio y video incluídas en Windows

Actualmente en el mercado existen varías herramientas de desarrollo para la grabación, edición, y reproducción de audio digital. Las más conocidas son : Sound Blaster, Media Visión, Audio Shop, Aud Track, etc.

Nosotros desarrollaremos la grabación de una señal digital de audio por medio de la grabadora de sonidos de Windows. Windows 3.1 proporciona el programa Sound Recorder que se utiliza para grabar sonidos por medio de los puertos de la tarjeta de sonido. Para empezar haga doble ckick sobre la ventana de accesorios mostrada a continuación:

Haga doble click sobre el icono de Sound Recorder. La siguiente figura muestra el panel de operación de la ventana Sound Recorder :

La siguiente tabla describe los botones que aparecen dentro de la ventana Sound Recorder :

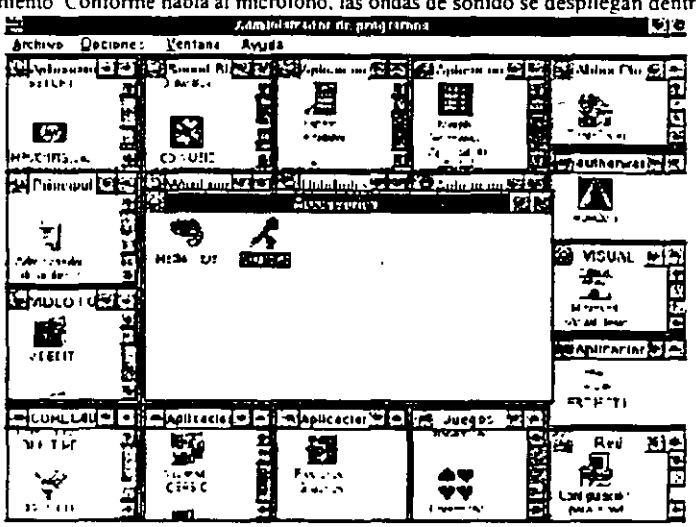
BOTÓN DE GRABACIÓN FUNCIÓN

<<	Regresa el archivo de sonido al inicio
>>	Adelanta un sonido
>	Reproduce el archivo de sonido actual
[]	Detiene la grabación o reproducción del archivo
MICRÓFONO	Empieza a grabar

El pequeño cuadro obscuro le permite ver la onda de sonido. La linea verde que aparece a la mitad de la caja es la linea base de la onda El cuadro POSICIÓN que se utiliza cuando se editan o mezclan archivos de sonido, le indica la posición actual dentro del archivo. El cuadro LENGTH indica cuanta información tiene grabada

GRABACIÓN DE UN ARCHIVO DE SONIDO DIGITAL

Para empezar debe encender su micrófono y hacer doble click en el botón record. Los contadores empiezan a incrementarse, y el cuadro deslizable empieza a moverse de izquierda a derecha en la barra de desplazamiento Conforme habla al micrófono, las ondas de sonido se despliegan dentro de la ventana como se muestra a continuacion.



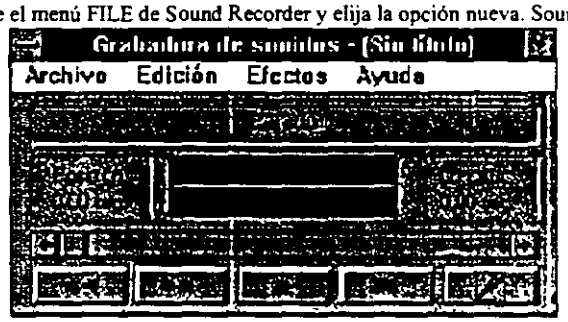
Para terminar ésta grabación, haga click sobre el botón STOP

Para reproducir su grabación, haga click sobre el botón REWIND. Observe la posición del archivo del contador POSICIÓN, así como la localización del cuadro de desplazamiento en la barra de desplazamiento horizontal. Ahora haga click sobre el botón Play. Mientras se reproduce la grabación, se pueden observar las ondas sonoras asociadas a este sonido. Para finalizar ésta reproducción, haga click en el botón STOP.

ELIMINAR UN ARCHIVO DE SONIDO DIGITAL

Cuando deseamos eliminar una grabación, ya sea porque está no reúne los requisitos indispensables o porque fue errónea, podemos grabar sobre ella simplemente regresándonos a la posición inicial de la grabación, o terminando esa sesión y no grabando los cambios hechos al archivo.

Cuando se requiera eliminar la grabación y empezar de nuevo, seleccione el menú FILE de Sound Recorder y elija la opción nueva. Sound recorder desplegará un cuadro de diálogo como el siguiente :

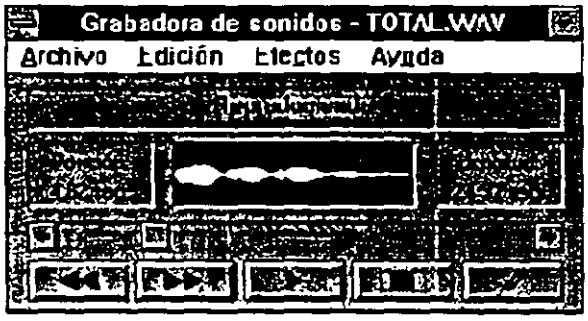


Cuando le pregunta si quiere grabar o eliminar la grabación, simplemente seleccione la opción NO para eliminar la grabación.

GUARDANDO LA GRABACIÓN EN UN ARCHIVO *.WAV

Después de haber hecho la grabación habrá que guardarla en un archivo con el formato WAV. Una vez guardado este archivo, se podrá utilizar en diferentes presentaciones multimedia que cuenten con la capacidad de reproducir archivos WAV.

Para guardar el archivo, seleccione el menú FILE y elija la opción SAVE AS Sound Recorder desplegará el siguiente cuadro de diálogo



Teclea el nombre del nuevo archivo No olvide especificar la ruta apropiada para el almacenamiento. Seleccione la opción OK

EFECTOS DE SONIDO ESPECIALES

Algunas tarjetas de sonido, incluyen todo el software necesario para realizar la edición y la manipulación de los archivos de sonido.

Utilizaremos la grabadora de sonidos de Windows para conocer algunos de los efectos de sonido para archivo digitalizados. Primero seleccione un archivo por medio del menú FILE y con la opción OPEN. Para ello usted debe tener en su lista de archivos un archivo de música de fondo y un archivo de voz que usted previamente ya grabó y digitalizó. Escriba el nombre del archivo de voz y elija OK

Cuando se despliegue el panel de control de la grabadora de sonidos de Windows, reproduzca este archivo utilizando el botón PLAY.

Anteriormente se explicó que la amplitud de la onda de sonido determina su volumen. Sound Recorder permite controlar el volumen del archivo de sonido Seleccione el menú EFECTOS de Sound Recorder y elija si sube el volumen con la opción SUBIR VOLUMEN o si lo baja con la opción BAJAR VOLUMEN .

Para cambiar la velocidad del archivo digital, seleccione el menú EFECTOS y elija aumentar la velocidad con la opción AUMENTAR VELOCIDAD o disminuir la velocidad con la opción DISMINUIR VELOCIDAD.

Para agregarle eco al archivo digitalizado, seleccione el menú EFECTOS y la opción AGREGAR ECO, el archivo cambiará considerablemente agregando una sensacion de profundidad y esto hace que el sonido parezca proyectado desde una montaña o una cueva.

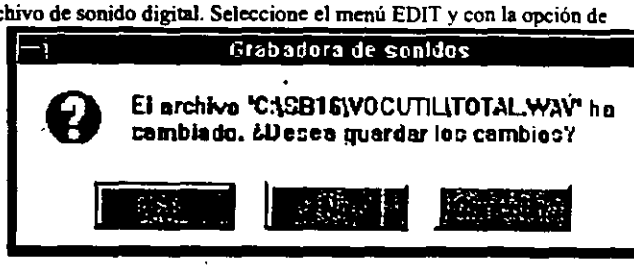
Para reproducir un sonido al revés, seleccione el menú EFECTOS y la opción INVERSO. El sonido será reproducido por la grabadora de sonido de manera inversa

REALIZANDO UNA MEZCLA DE DOS ARCHIVOS DE SONIDO

Realizar una mezcla de sonido es simplemente hacer que dos archivos de sonido digital sean reproducidos al mismo tiempo Si se está creando un archivo de sonido digital para una presentacion, con un micrófono se podrá realizar está grabacion y posteriormente se podrá combinar con un archivo previamente grabado

Para mezclar dos archivos de sonido con la grabadora de sonidos de Windows, cargue un archivo de sonido digital. Seleccione el menú EDIT y con la opción de

Para mezclar dos archivos de sonido con la grabadora de sonidos de Windows, cargue un archivo de sonido digital. Seleccione el menú EDIT y con la opción de



MEZCLAR DOS ARCHIVOS DE SONIDO se desplegará el siguiente cuadro de diálogo

Elija el archivo de música de fondo y asigne OK. Después de contar con los dos archivos a mezclar, haga click en play y escuche el resultado. Deberá escuchar en el primer plano la música de fondo y en el segundo plano la voz digitalizada.

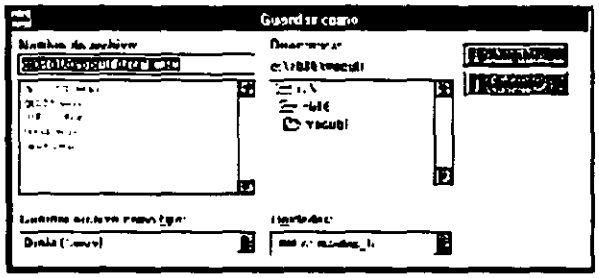
EDICIÓN DE UN ARCHIVO DE SONIDO

Si es grabado un sonido utilizando un micrófono, lo más probable es que se experimente un periodo de tiempo antes de que sea escuchado, para ello la grabadora de sonido de Windows proporciona un método de edición. Para eliminar las partes no deseadas de la grabación, reproduzca el sonido para la posición deseada o utilice la caja de desplazamiento. Después, seleccione las opciones del menú EDIT etiquetadas como ELIMINAR ANTES DE LA POSICION INICIAL ó ELIMINANDO DESPUES DE LA POSICION ACTUAL, para eliminar ese fragmento de sonido. Utilizando estas dos opciones, puede reducir su archivo de sonido a solamente las secciones que contiene el sonido deseado.

HERRAMIENTAS DE VIDEO DIGITAL (Video para Windows)

Para la edición y presentación de video digital en una computadora personal se emplean diversos software' entre ellos quizá el más destacado en nuestros días es el Video para Windows.

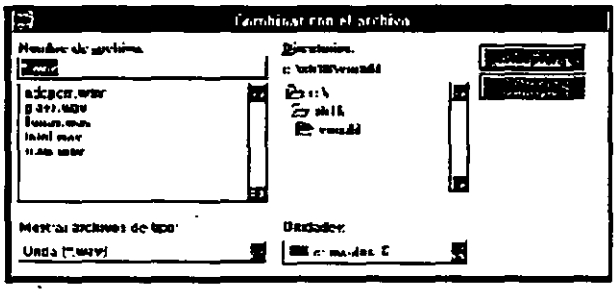
Video para Windows es utilizado para correr secuencias de video en movimiento en una computadora pers y no requiere de algún hardware especializado para su uso. Si usted utiliza Video para Windows, podrá cre diversas animaciones, secuencias de video, e incrustar estas en una presentación Multimedia.



Si usted tiene en su sistema instalados una tarjeta VGA, un monitor VGA o algún otro superior, podrá hacer uso de video para Windows. Las caracteristicas y ventajas mas importantes que actualmente brinda Video para Windows son :

- Permite reproducir correctamente secuencias de video que han sido almacenadas en CD-ROM
- Una eficiencia excelente cuando se reproduce video digital en computadoras con memoria limitada.
- Carga rapida para aplicaciones de video digital
- Permite comprimir video en diferentes formatos y capacidades
- Permite reproducir el audio y el video en cuadros interfoliados

La estructura de un archivo de video digital es como la mostrada a continuación:



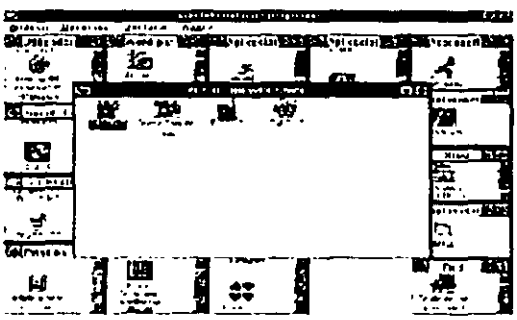
A este tipo de archivos se les llama *.AVI (audio video interleaving), lo cual indica que será reproducido un cuadro de video con un "trozo" de audio Para ello existen varias configuraciones que permiten variar el número de imágenes a intercalar entre cuadros.

Como lo analizamos en la sección física de video, los diferentes formatos de compresión utilizan técnicas de ahorro para la proyección y despliegue de imágenes repetitivas

Video para Windows tiene una característica muy importante. permite el uso de la opción slate rate que es variar el número de cuadros que aparecen en una secuencia de video en movimiento. A continuación se presentan dos de las herramientas más populares para la manipulación de videos digitales

VIDEOCAP

Video VideoCap es la herramienta de captura de video que incluye Video para Windows:



Con VideoCap podemos capturar datos digitales y crear archivos digitales con el formato * AVI además podemos digitalizar secuencias de cuadros, o cuadros fijos en varios formatos de los que destacan los siguientes TGA, BMP, DIB, PCX, etc

En la figura anterior podemos observar que la pantalla principal del VideoCap está formada por 5 partes

- Por la Barra del Título, que es donde se informa al usuario con que archivo se está trabajando.
- Barra de Menú, donde se puede dar acceso a las diferentes opciones de los menús
- Barra de Herramientas, donde se encuentran los iconos más importantes para la operación del programa.
- Area de Despliegue, donde se desplegará el cuadro de la imagen a digitalizar

- Area de Despliegue, donde se desplegará el cuadro de la imagen a digitalizar.
- Barra de Estado, donde se despliega toda la información acerca de los procesos que se están llevando a cabo.

ar el VideoCap es como manejar cualquier otro programa en el ambiente Windows. A continuación presentamos las diversas opciones que ofrecen los ntes menús del VideoCap.

MENU FILE

En este menú se especifican las caracteristicas más comunes para el manejo de archivos como , abrir , salvar, etc. Además se incluyen opciones especificas para salvar un cuadro de video en alguno de los formatos antes mencionados o incluir un cuadro o una secuencia de video proveniente de otro archivo de video

Load Palette

Importa secuencias de color con un máximo de 256 colores predefinidos. VideoCap permite importar imágenes con video secuencias de 8 bits

Set Captura File

l ca y crea el archivo por default para la secuencia de capturas.

Save Captura Video As

Copia el contenido de la captura realizada en el archivo y la ruta que se especifique.

Save Palette

Salva la paleta de color del actual archivo de video capturado

Save Single Frame

Salva una imagen individual en el archivo y la ruta especificada

Edit Capture Video

r ite visualizar en el VideoEdit el archivo capturado para ver como es que el archivo puede corregirse, o mejorarse.

EDIT MENÚ

Este menú permite copiar una secuencia al Clipboard, pegar una secuencia, y definir algunos parámetros de presentación:

Copy

Copia una imagen individual al clipboard.

Paste

Pega una imagen individual proveniente del Clipboard.

Preferences

Define parámetros de presentación del VideoCap

OPTIONS MENÚ

En este menú se definen los parámetros más importantes para la captura de la secuencia de video

Audio Format

Define las caracteristicas del sonido, bits de muestreo, canales de grabación, frecuencia final

Video Format

Define las caracteristicas de la grabación digital, el tamaño de la pantalla

Video Source

Permite definir de donde vendrá la señal de video, del formato original, si es una señal de video compuesto o S-VHS.

Preview Video

Permite visualizar la precaptura del video, osea ver la imagen en tiempo real de la señal de entrada.

CAPTURE MENU

En este menú se pueden especificar algunas de las características más fundamentales para definir la paleta de captura, imágenes individuales, UN GRUPO DE IMÁGENES, ETC.

Single Frame

Permite la captura de un solo cuadro de video.

Frames

Permite la captura de varios cuadros a la vez para posteriormente salvar la captura como una secuencia de fotogramas.

Video

Inicia la captura del video digital.

Palette

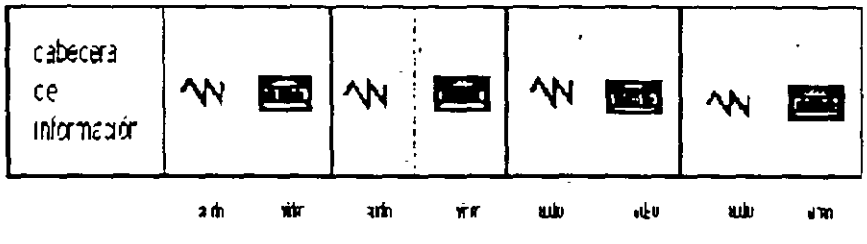
Permite definir el número de colores que serán capturados por cuadros, por secuencia de cuadros, o por video digital.

HELP MENU

Este menu proporciona la ayuda en línea para el manejo y la manipulación de estos archivos Su manejo es común a todas las ayudas en linea de los programas Windows

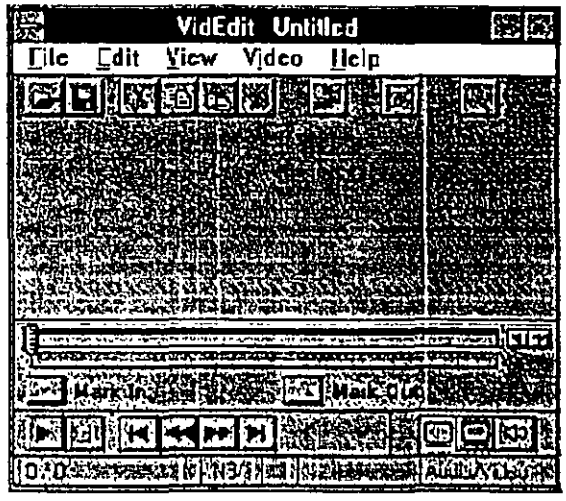
REALIZANDO LA CAPTURA DE UN ARCHIVO DE VIDEO DIGITAL

Lo primero que se tiene que hacer para una captura de video, es definir a dónde se va a ir el archivo capturado y esto lo definimos en el menú FILE con la opción SET CAPTURA FILE, cuyo cuadro de diálogo es el definido a continuación:



Posteriormente definimos las características de audio a capturar en función del proyecto y la calidad de audio que sean las requeridas. Para variar las características de audio a capturar por medio del menú OPTIONS seleccionamos la opción AUDIO FORMAT y las opciones son las mostradas a continuación

Ahora como en el punto anterior, seleccionamos la opción COMPRESSION OPTIONS y se despliega la ventana anterior :



En este cuadro se muestra el destino del archivo de video, el método de compresión utilizado, los detalles de la compresión, el nivel de interfoliado de cuadros, un previous para la compresión, etc. Es recomendable comprimir el archivo por el método de Cinepak Codec by Supermatch

Después de definir los parámetros, cerramos este cuadro y por medio del menú FILE seleccionamos la opción SAVE AS y renombramos este archivo

Cuando se termine este proceso podemos abrir la opción de STATISTICS y observar el nivel de compresión del archivo.

Al terminar todo este proceso, este nuevo archivo de video compreso ya es un nuevo objeto que puede se utilizado por alguna aplicación Multimedia.

FACULTAD DE INGENIERIA U.N.A.M.
DIVISION DE EDUCACION CONTINUA

EDICIÓN DE ARCHIVOS DIGITALES DE AUDIO Y VIDEO

(CC061)

Profesor:
Ing. Eduardo Ordúñez Segura

Anexo E)
Para complementar las notas del curso.

Agosto de 1998

INTRODUCTION

Welcome to the Adobe Premiere™ program—software that brings the world of digital movie-making to the desktop. Adobe Premiere works with Microsoft® Video for Windows and QuickTime™ for Windows software, and lets you record, create, and play movies from video, sound, animations, photographs, drawings, text, and other material using your IBM™ or IBM-compatible personal computer.

Microsoft Video for Windows and QuickTime for Windows are system utilities that let you integrate audio and video in Windows applications. You can play movies created in Adobe Premiere in any application that supports these formats, or output movies to videotape.

BEFORE YOU BEGIN

Before beginning to use Adobe Premiere, you should have a working knowledge of Microsoft™ Windows™ and the PC. You should know how to use the mouse and standard Windows menus and commands. You should also know how to open, save, and close files. For information on basic Microsoft Windows features, see your Microsoft Windows documentation.

Before using this manual, you need to install the program by following the instructions given in the *Adobe Premiere Getting Started* booklet accompanying this guide. This booklet also provides information on new features in Adobe Premiere 4.0, and on allocating memory, working efficiently, improving performance, and using the Adobe Type Manager™ with Adobe Premiere. For a complete list of keyboard shortcuts to use with Adobe Premiere, see the Quick Reference Card.

ABOUT THIS MANUAL

The *Adobe Premiere User Guide* provides detailed information about the Adobe Premiere tools and commands. It is designed to be used as a reference tool in your everyday work with Adobe Premiere. This user guide is organized as follows:

- Chapter 1 contains a short tutorial designed to familiarize you with the basic concepts of making movies with the Adobe Premiere program.

- Chapter 2 discusses how to start an Adobe Premiere project and how to work with the Project and Construction windows to assemble a movie. It also introduces some tools to help you keep your clips and editing sessions organized.

• Chapter 3 covers the basic techniques used to edit clips and construct a movie in Adobe Premiere. It also describes how to generate an Edit Decision List (EDL) from the Construction window for online editing of source videotape in a post-production studio.

• Chapter 4 discusses how to preview a project without compiling the entire contents of the Construction window, and how to set preview options.

• Chapter 5 describes how you use the more than 70 transitions included in Adobe Premiere to create eye-catching transitions between movie or still-image clips.

• Chapter 6 describes how to apply video and audio filters to clips to distort, blur, sharpen, smooth, texture, and color images, and to create special effects. The chapter also shows you how to create motion effects in movie and still-image clips.

• Chapter 7 explains how to superimpose movie and still-image clips, and how to use the Adobe Premiere Title window to create titles and graphics for a movie.

• Chapter 8 describes how to compile and videotape movies including selecting output options. It also discusses considerations for digital video compression and using Adobe Premiere movies in other applications including Adobe Photoshop™.

• Chapter 9 offers general considerations for digitizing hardware and includes guidelines for capturing video including batch-capturing video, selecting recording options, and capturing with timecode.

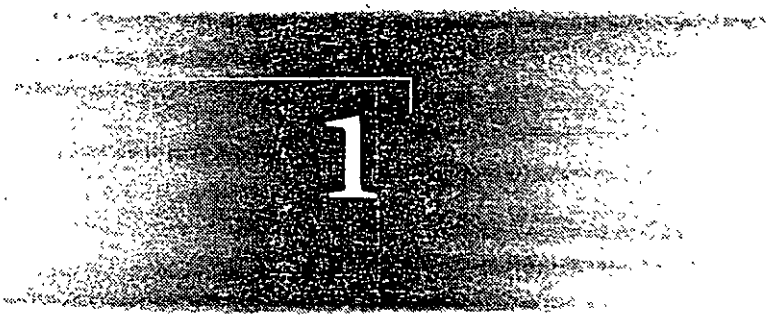
• Chapter 10 includes tips and techniques for using the program and illustrates different effects you can achieve using the many features in Adobe Premiere.

• Appendix A, "Video Basics," discusses the fundamentals of video and audio.

• Appendix B, "Expressions for Creating Transitions and Filters," covers the mathematical expressions used to create custom transitions and filters.

An index concludes the book.

Chapter



Chapter 1: Basic Concepts

This chapter contains a short tutorial designed to familiarize you with the basic concepts of making movies with the Adobe Premiere program. Adobe Premiere is powerful video- and audio-editing software designed to be a useful tool for the professional and novice alike. Adobe Premiere provides a comfortable and familiar working environment for those with both film and video experience. Those with no video experience will find the software to be a thorough introduction to the world of desktop video. Video and multimedia professionals will find Adobe Premiere a valuable tool for tasks such as video editing (both online and off-line) or creating Video for Windows or QuickTime movies for presentations and CD-ROMs. Many of the program's features were previously available only on high-end professional video-editing systems.

In many instances, you will encounter terminology and interface designs drawn from traditional video production and post-production. For information on the fundamentals of video and audio, see Appendix A, "Video Basics."

Note: *In this manual, commands in submenus are indicated by a preceding greater-than s (>). For example, the instruction "Choose Import > Project from the File menu" means that you should choose Import from the File menu and Project from the submenu.*

CREATING DESKTOP VIDEO WITH ADOBE PREMIERE

Adobe Premiere lets you combine source material, or *clips*, to make a movie, and then view and play the movie using any application that supports the Video for Windows or QuickTime movie format. Your final Adobe Premiere movie is a file you create after assembling and editing clips.

Clips can include the following:

- Digitized video captured from cameras, VCRs, or tape decks
- Video for Windows or QuickTime movies made using Adobe Premiere or other sources
- Scanned images or slides
- Digital audio recordings and synthesized music and sound
- Adobe Photoshop files

- Animation files
- Filmstrip format files created in Adobe Premiere and edited in Adobe Photoshop
- Titles

You can create your own video and audio clips by recording material to your computer's hard disk using a variety of hardware products. For more information on recording to your hard disk, see Chapter 9, "Capturing Video."

CREATING AN ADOBE PREMIERE MOVIE: A TUTORIAL

Every Adobe Premiere movie starts as a *project*—a collection of clips organized along a timeline. This section provides step-by-step instructions for building a simple Adobe Premiere movie using clips supplied on your program disks.

Creating an Adobe Premiere movie involves the following basic tasks:

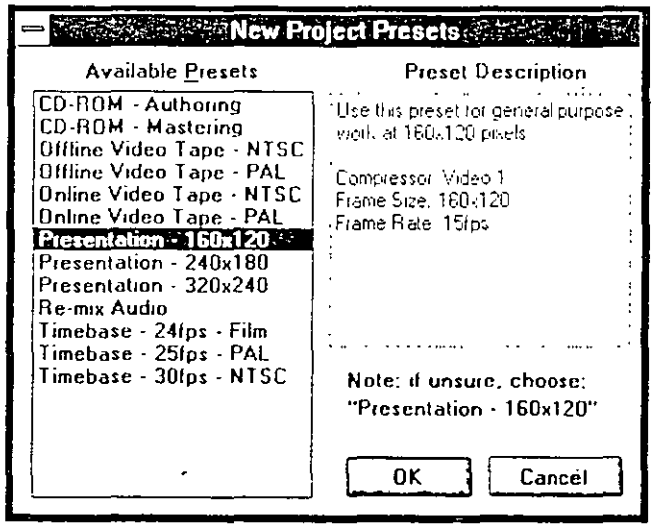
- Creating a new project and importing clips
- Assembling clips in the Construction window
- Viewing and editing clips in the Clip window
- Applying transitions and filters to the assembled clips
- Adding a superimposed title to the movie
- Previewing the movie
- Compiling the assembled clips into a movie and playing it

Note: *The steps for making a movie vary depending on the intended use of the medium. If your goal is to make a videotape with full-frame images, you must understand the capabilities and limitations of your hardware. For information on hardware requirements, see Chapter 8, "Compiling and Videotaping Movies," and Chapter 9, "Capturing Video."*

Create a new project and import clips

Before you start this tutorial, make sure that you have installed the sample clips when you installed the Adobe Premiere program. If you chose the default location during installation, the samples are in the *samples* directory in the *premiere* directory. See *Adobe Premiere Getting Started* for instructions on installing the program.

1 In the Adobe group of the Program Manager, double-click the Adobe Premiere program icon to start the program. The New Project Presets dialog box appears.

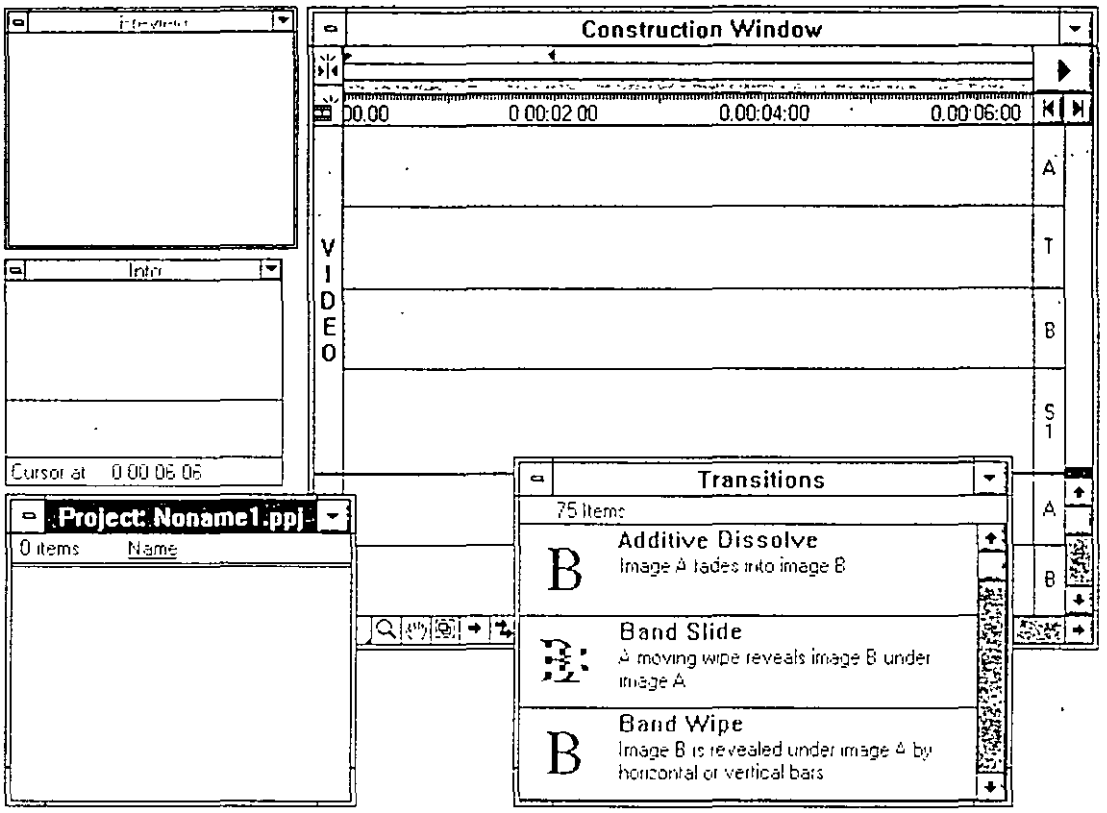


Every new Adobe Premiere project must be assigned a *preset*. A preset specifies the project time base, the movie frame rate, and options for compression, previewing, and output. Project presets are described in detail in Chapter 2.

2 Choose Presentation (160 x 120) from the Available Presets list and click OK. Five windows appear:

- Project window, for importing and storing clips
- Construction window, for assembling clips
- Info window, for displaying detailed information about clips
- Transitions window, for selecting special effects transitions between clips
- Preview window, for previewing the movie as you assemble it in the Construction window

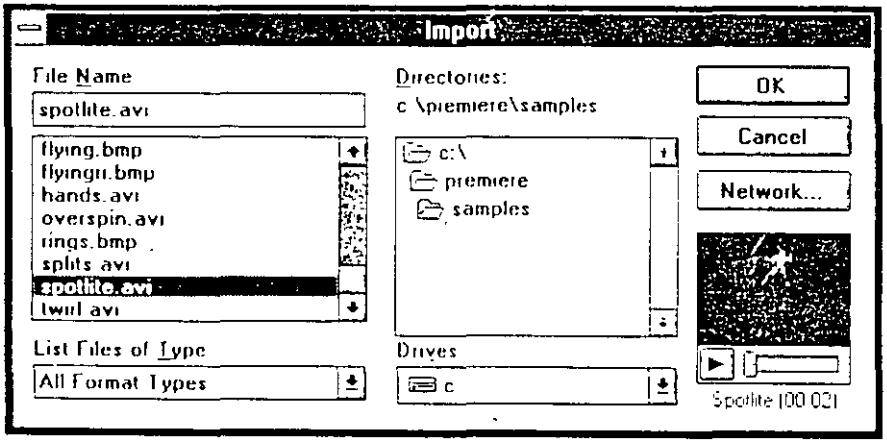
When the program opens, the Project window is the active window. You use the Project window to stockpile clips for your movie.



3 Choose Import > File from the File menu (Ctrl+I) or double-click the bottom area of the Project window below the last clip. The Import dialog appears.

4 In the *premiere* directory, locate the sample movie clips supplied with the program.

5 Select the *spotlite.avi* movie clip. A preview of the movie appears in the Import dialog box.

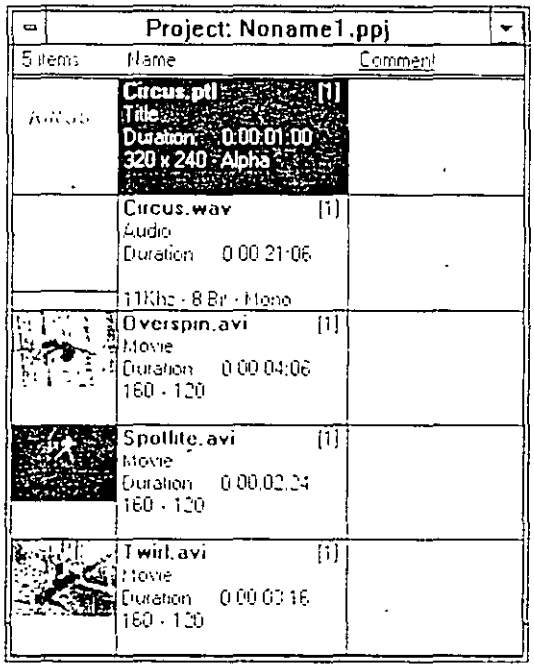


6 To play the movie clip, click the Play button beneath the preview.

7 Click OK to import the clip. The clip name and a thumbnail appear in the Project window. For a movie clip, a *thumbnail* is an approximation of a frame in the clip.

8 To import additional clips, choose Import > File from the File menu (Ctrl+F). The Import dialog box appears. In the *premiere* directory, locate the sample movie clips supplied with the program.

9 Hold down Ctrl and select the video clips *twirl.avi* and *overspin.avi*, the title clip *circus.ptl*, and the audio clip *circus.wav*. Click OK to import the files.

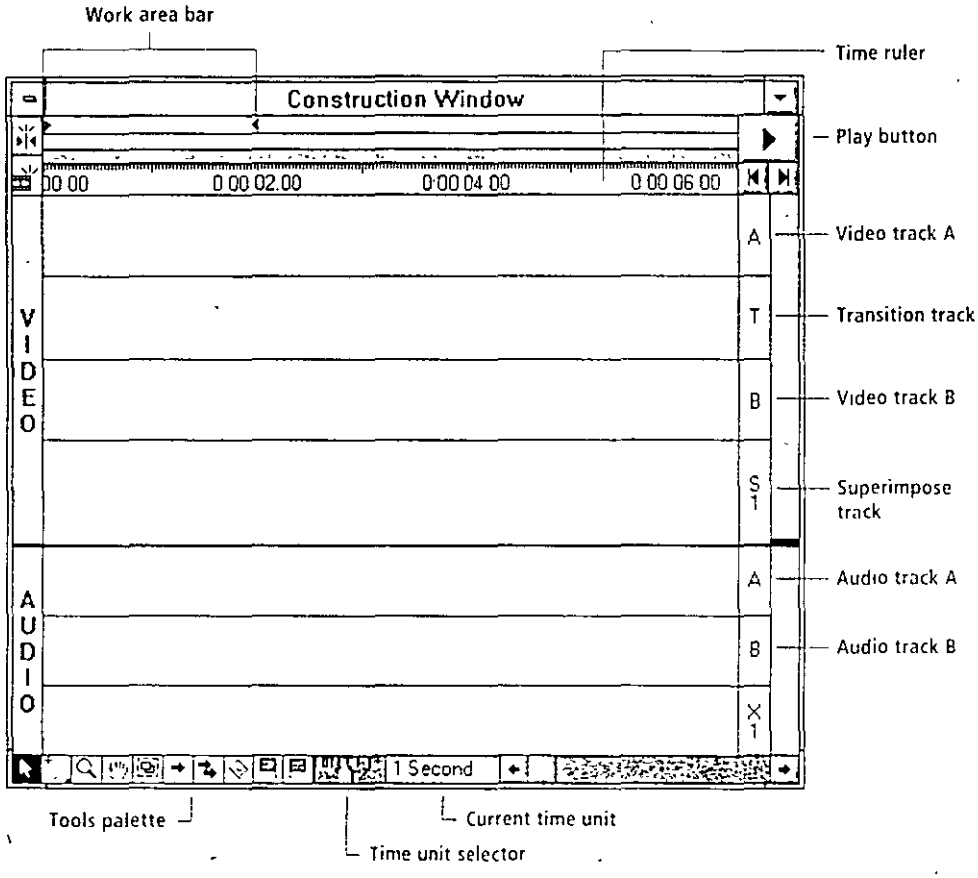


Assemble clips in the Construction window

You use the Construction window to assemble clips into a movie. The Construction window contains multiple tracks for placing video and audio clips. The video tracks include the main video tracks A and B, the T track for transitions, and the S tracks for superimposed video clips. The lower set of tracks is for audio clips. Tracks are identified in the vertical bar at the right of the window.

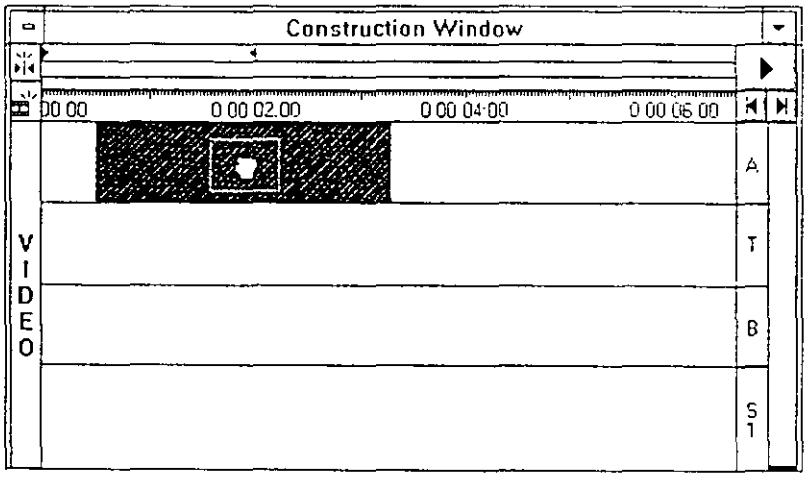
At the top of the Construction window is a *time ruler* that indicates elapsed time in the movie. The tick marks on the ruler can represent anything from a single frame to a 2-minute interval, depending on the time unit selected. You can use the slider at the

bottom of the Construction window to change the time unit, thereby changing the level of detail displayed in the window; a smaller time unit causes more frames in the clip to be displayed.

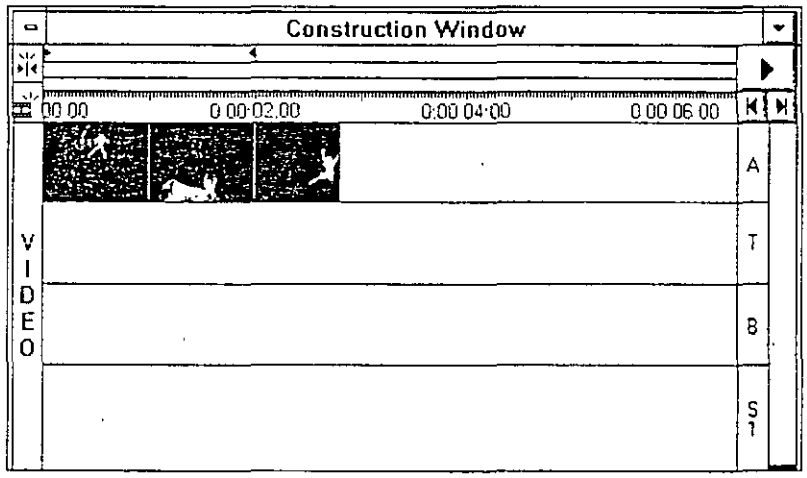


1 Position the pointer over the thumbnail of the *spotlite.avi* clip in the Project window. The pointer changes to a hand.

2 Hold down the mouse button, and drag the clip onto the top track (track A) of the Construction window. The track turns dark gray to show where the clip will be placed.

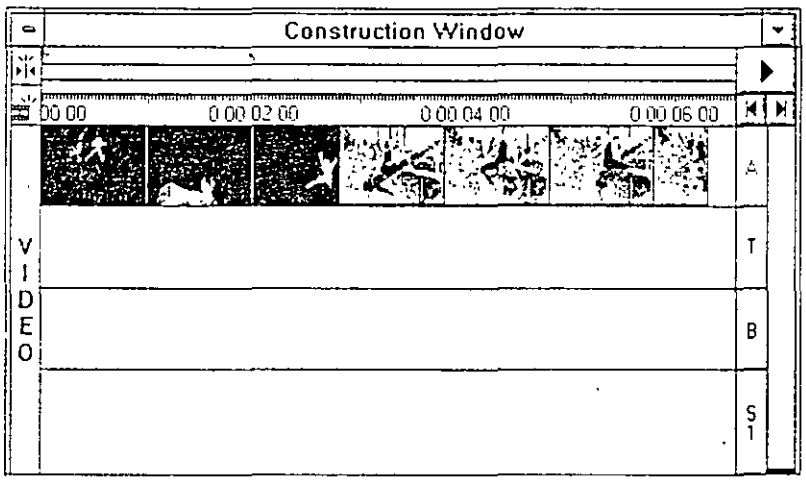


3 Drag to align the left edge of the clip with the left edge of the Construction window. Release the mouse button to place the clip.



When you place a clip in the Construction window, it is displayed as a series of thumbnails that represent frames of the clip. The width of the strip of thumbnails represents the duration of the clip. You can move clips in the Construction window by dragging them.

4 Drag the *Twirl* clip from the Project window onto track A so that its left edge butts up against the right edge of the *Spotlite* clip.

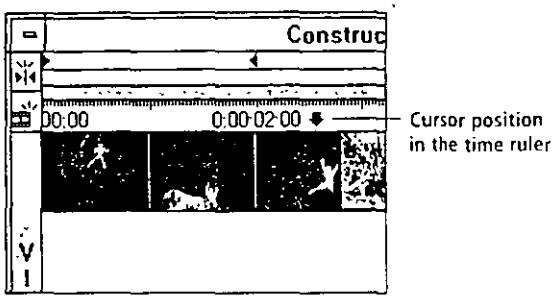


Positioning the two clips like this creates a *cut*, or transition, from the *Spotlite* clip to the *Twirl* clip.

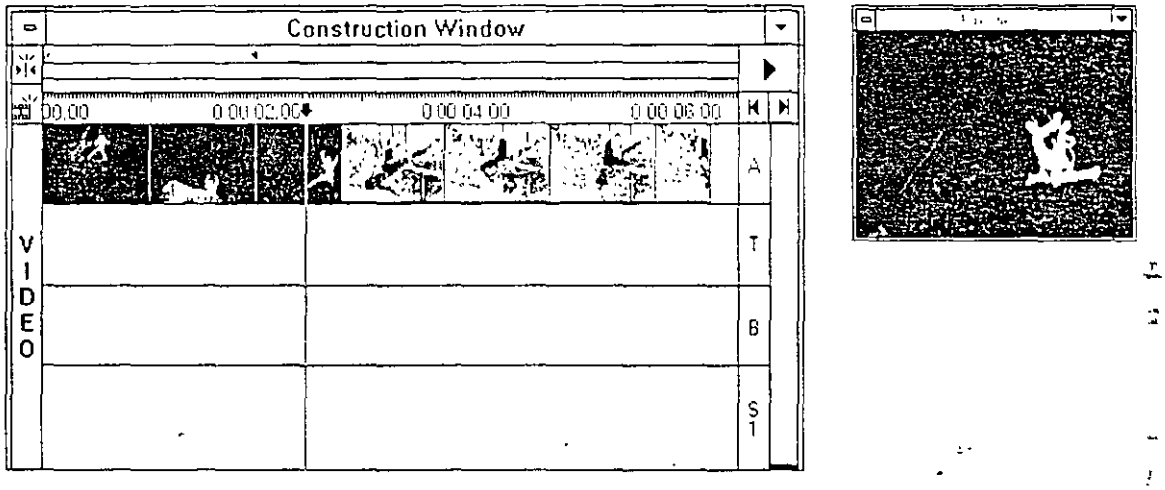
Preview the movie

You can preview the movie at any time to view the results of your work in the Construction window.

1 Place the pointer in the time ruler at the top of the Construction window. The pointer changes to a downward-pointing arrow.



2 Hold down the mouse button. The Preview window displays the movie frame that corresponds to the current location in the time ruler.



Note: *If the pointer is not positioned correctly, the Controller window may appear when you hold down the mouse button. If this happens, simply close the Controller window and try again.*

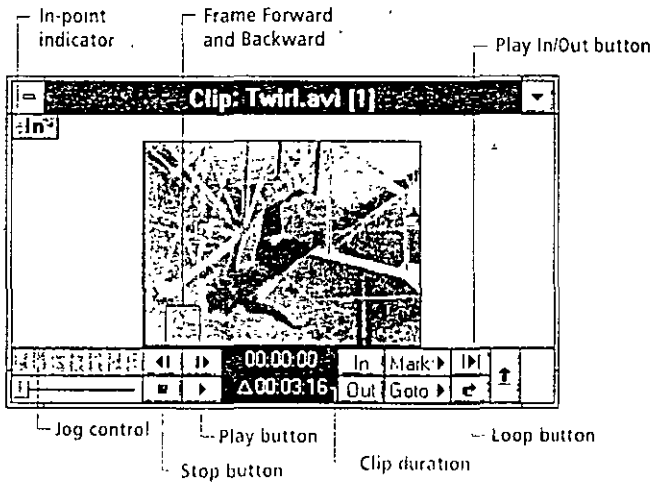
3 To play a preview of the movie in the Preview window, drag to the right while holding down the mouse button. Note that when the first clip ends, the second clip begins playing.

Change the duration of a clip

After previewing, you may decide that you don't need to include an entire clip in your movie. You can use the Clip window to view a clip and choose which frames you want to include in the Construction window. The frames that are included are defined by the clip's *in point* (the position of the starting frame) and *out point* (position of the ending frame). The process of changing these points is called *trimming* the clip. Changes made to a clip in the Clip window are automatically applied to the clip in the Construction window.

1 Double-click a thumbnail of the *Twirl* clip in the Construction window.

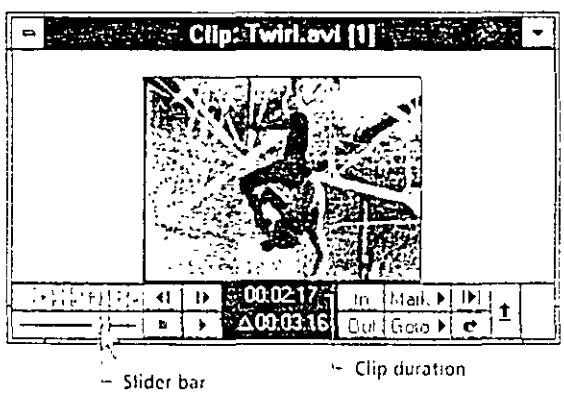
The Clip window opens with the starting frame of the *Twirl* clip. Notice that an in-point indicator appears in the upper-left corner of the window.



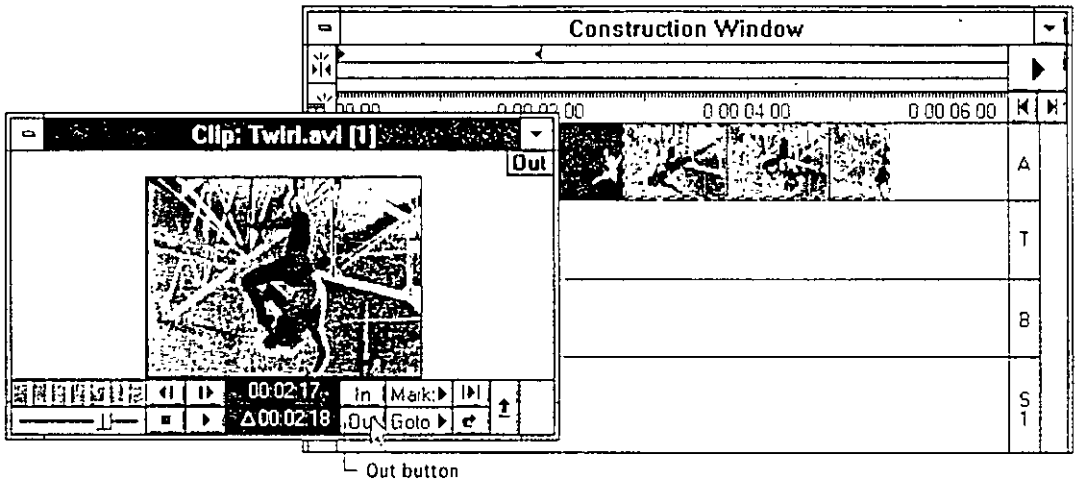
Controls for viewing and playing the clip are located in the lower portion of the window. The frame indicator in the center displays the address of the current frame in the Society of Motion Picture and Television Engineers (SMPTE) timecode format (Hours:Minutes:Seconds:Frames). Below the frame indicator, the duration of the clip is displayed using the same format. (For more information on timecode, see "SMPTE Timecode" on page 284.)

2 Click the Play button to play the clip in the Clip window. You can also drag the slider control or the Jog control to view the clip as it plays in the forward or reverse direction.

3 Drag the slider bar (located to the left of the Play button) back to rewind the clip until 00:00:02:17 appears in the frame indicator. For more precision in locating the frame, drag the Jog control above the slider bar, use the Frame Forward and Frame Backward buttons, or use the Left and Right Arrow keys. The displayed frame will be the new out point for the clip.



4 Set the new out point by clicking the Out button in the lower-right corner of the window.



An out-point marker appears in the upper-right corner of the window. The clip is shortened in the Construction window accordingly.

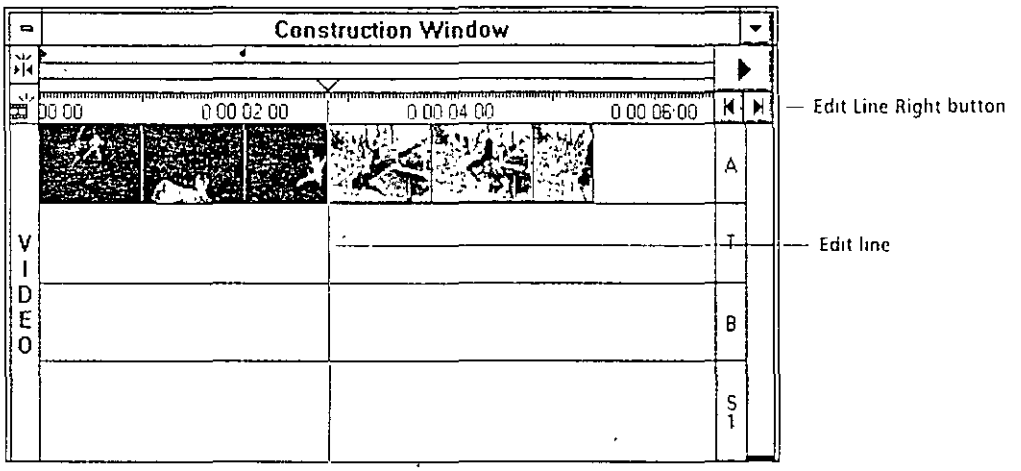
Note: *You can also drag the edges of a clip in the Construction window to change its in and out points. For more information on setting in and out points, see "Trimming Clips" on page 76.*

5 To keep the screen from becoming too cluttered, close the Clip window when you have finished adjusting the clip duration.

Trim clips at the cut point

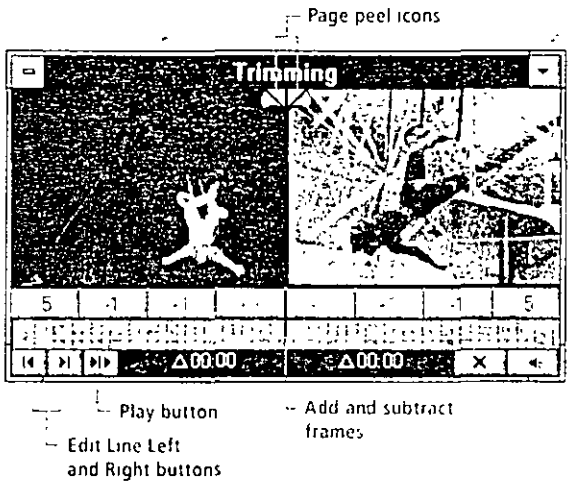
The most accurate way to change the in points and out points of clips while getting instant feedback on the effect in the Construction window is to use the Trimming window. The Trimming window lets you simultaneously change the in points and out points of the clips on both sides of a cut.

1 Click the right arrow under the Construction window's Play button to move the edit line to the cut between the *Spotlite* clip and the *Twirl* clip.



2 Choose Trimming from the Windows menu.

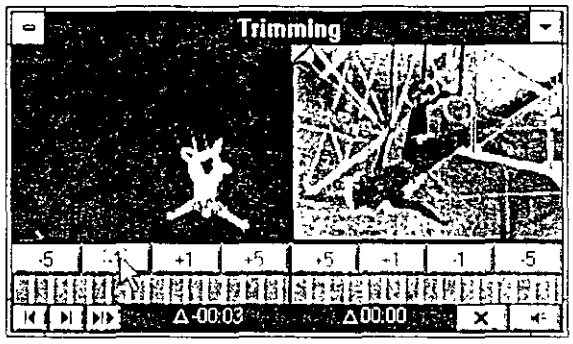
The Trimming window appears, displaying the frames on the left and right sides of the cut: the out point of the *Spotlite* clip and the in point of the *Twirl* clip, respectively.



In this case, the out point of the *Spotlite* clip is also the last frame of the source clip, as indicated by the red page peel icon in the corner of the clip. Likewise, the in point of the *Twirl* clip is also the first frame of that source clip.

3 Click the –1 button under the left clip (*Spotlite*) three times to subtract three frames from the out point of that clip.

Notice that the edit line moves to the left in the Construction window as the out point changes, and the clip to the right of the edit point (*Twirl*) shifts left. The total number of frames subtracted from the out point appear at the bottom of the Trimming window.



Total number of frames subtracted

When you trim clips in the Trimming window, clips and transitions on other tracks shift right or left to maintain their positions relative to the clip being trimmed. You can lock individual tracks to keep their contents from shifting during editing. For information on track locking, see "Locking Tracks in the Construction Window" on page 94.

4 Click the –5 button under the right clip (*Twirl*) to subtract five frames from the in point of that clip. Notice that the *Twirl* clip shortens in the Construction window. Now click the +1 button to add back one frame to the in point.

5 Click the Play button to preview the edits in the Trimming window. The window plays the five seconds of the clip that surround the edit point. (You can set a different number of seconds to include in the Preview as one of the Trimming window options.)

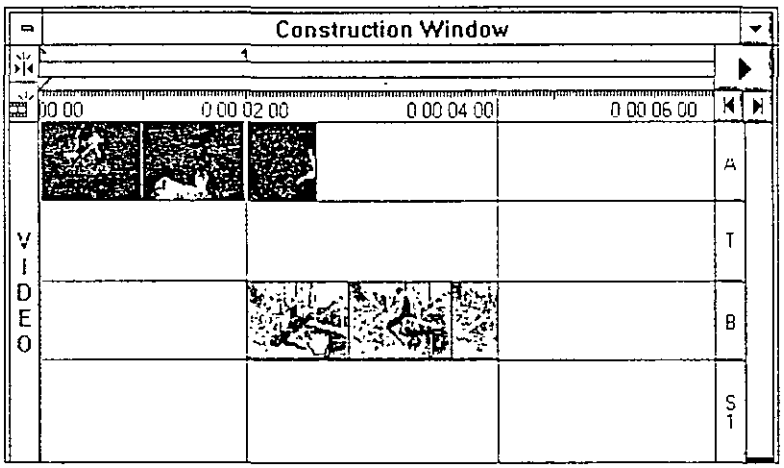
6 Close the Trimming window.

Add transitions

You can create gradual transitions between clips. However, clips must be located on the separate video tracks A and B to apply a transition between them.

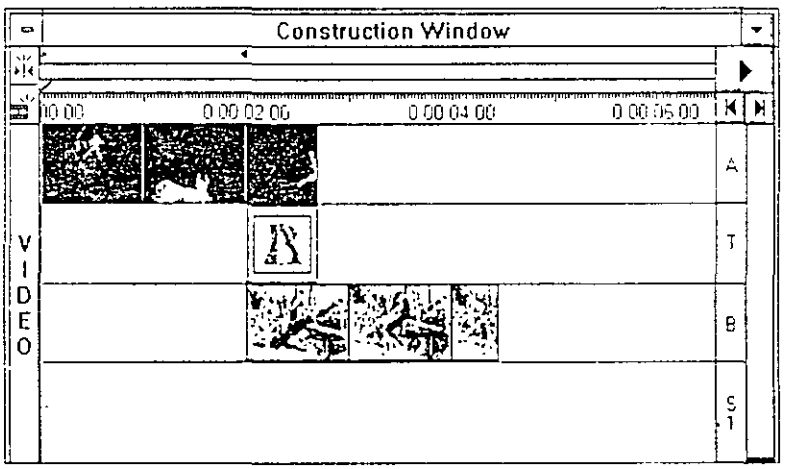
1 Make the Construction window active by clicking in the window or by choosing Construction from the Windows menu.

2 Drag the *Twirl* clip from track A to track B and position it so that the clip overlaps the *Spotlite* clip on track A by approximately 1 inch (slightly less than 1 second on the time ruler). The amount of overlap determines the length of the transition.



3 In the Transitions window, scroll to the Cross Dissolve transition. (You can also type the first letter of a transition to scroll to that transition.)

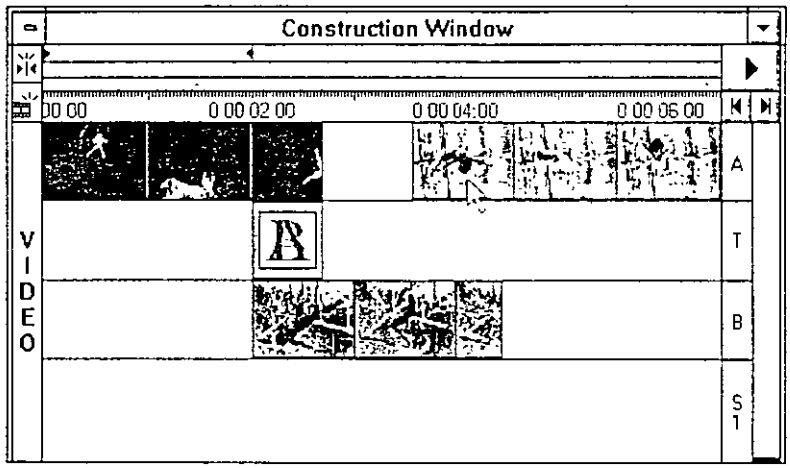
4 Click and drag the transition onto the T track between the two movie clips. As you drag the transition onto the space where the two movie clips overlap, the program automatically adjusts the length of the transition to fit the overlapping section.



5 Preview your movie again by holding down the mouse button and dragging the arrow through the time ruler. Notice how the *Spotlite* clip gradually fades out while the *Twirl* clip fades in.

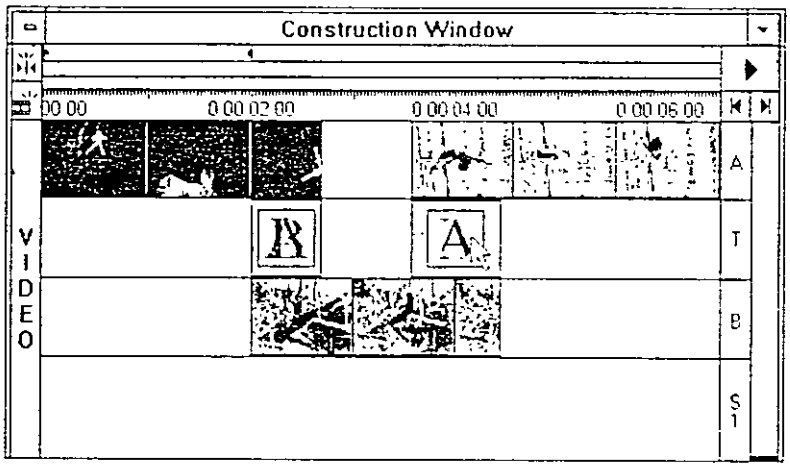
Next, you will add another clip and transition.

6 Drag the *Overspin* clip from the Project window onto track A and position it so that it overlaps the clip on track B by approximately 1 second on the time ruler.



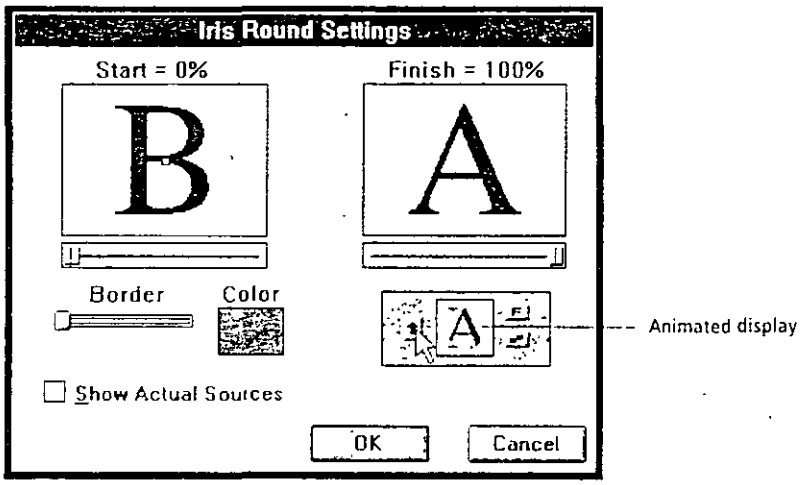
7 In the Transitions window, scroll to the Iris Round transition.

8 Drag the transition onto the T track between the *Twirl* clip on track B and the *Overspin* clip on track A.



In most situations, Adobe Premiere automatically sets the correct direction of a transition when it is placed between clips in the Construction window. In this case, a circular wipe should reveal the image on track A as it replaces the image on track B.

9 To check the direction of the Iris Round transition, double-click the transition in the Construction window. The Iris Round Settings dialog box appears.



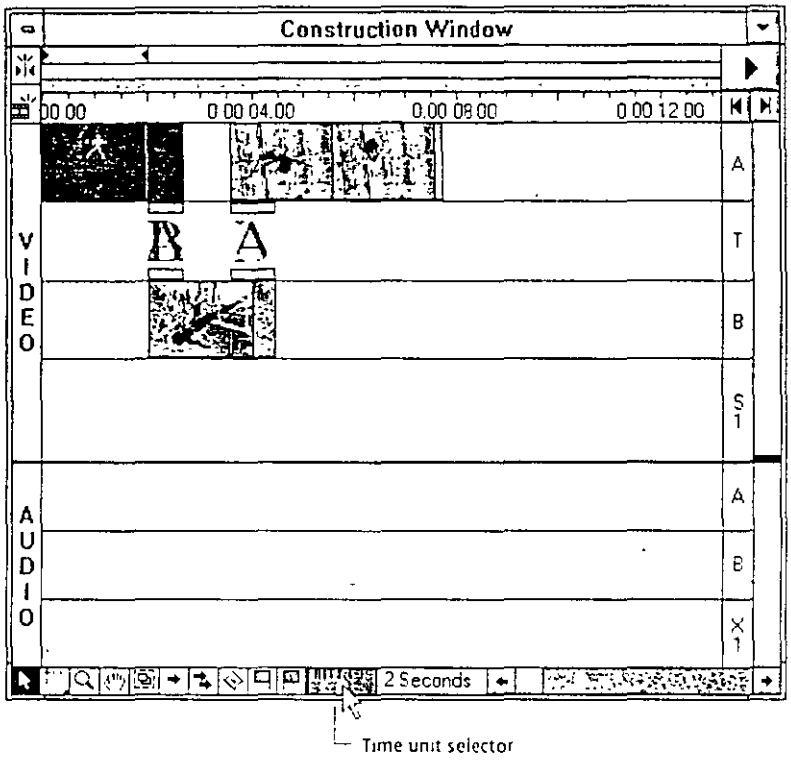
The animated display in the lower-right corner of the dialog box should indicate that image A is wiping over image B. If this is not the case, click the blue arrow to the left of the display so that the arrow is pointing upward.

10 Click OK.

Change the time unit in the Construction window

At this point, your movie is approximately 8 seconds long. Depending on the size of the Construction window on your monitor, the entire movie may not be visible. To see more frames of your movie in the Construction window, change the time unit. The time unit is currently set to 1 second, which means that the Construction window displays 1 thumbnail for each second of a clip.

1 Drag the slider at the bottom of the Construction window to the right one notch. The time unit changes to 2 seconds, which means that the Construction window shows two thumbnails for every 2 seconds of a clip. Consequently, you can see more of the movie in the Construction window.



2 To quickly see the entire movie in the Construction window, no matter how long the movie is, press the backslash key (\) while the Construction window is active. The time unit selector adjusts accordingly.

Apply a filter to a clip

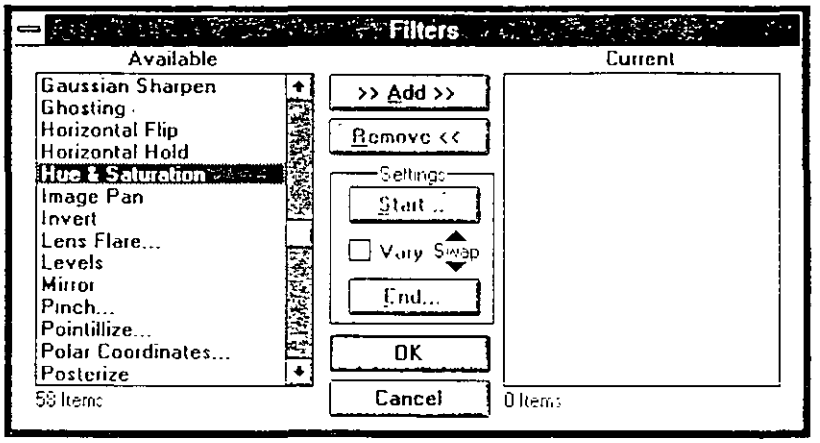
You can apply filters to clips to change their appearance or sound. Adobe Premiere includes more than 70 movie and still-image filters and 5 audio filters.

1 Click the *Twirl* clip on track B to select it. A dashed line appears around the border of the clip.

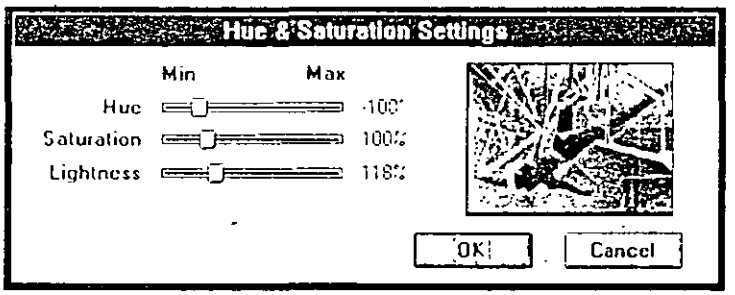
2 Choose Filters from the Clip menu (Ctrl+F). The Filters dialog box appears.

You can also position the pointer over the selected clip in the Construction window and click the right mouse button to display a pop-up menu of commonly-used commands for clips. To choose a filter from the pop-up menu, click the left mouse button on Filters.

3 Scroll through the Available list and select the Hue & Saturation filter.



4 Click Add. The Hue & Saturation Settings dialog box appears.



5 Drag the Hue slider to change the color of the clip.

6 Drag the Lightness slider to lighten the clip.

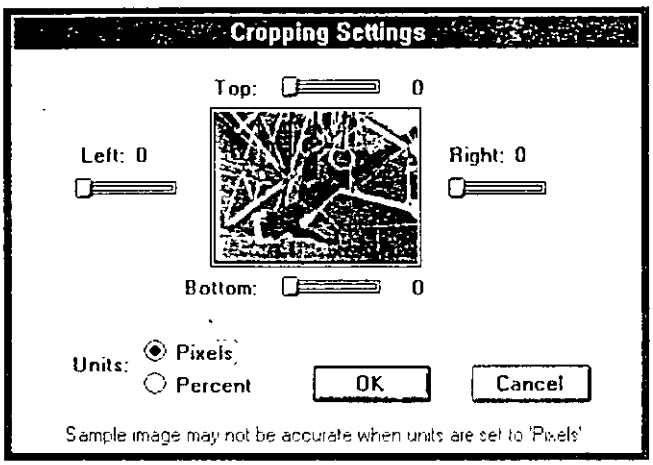
7 Click OK when you have finished adjusting the settings.

Apply another filter to the same clip

You can add multiple filters to a clip. Adobe Premiere applies the filters in the order that you list them in the Current list in the Filters dialog box.

When you play the *Twirl* clip in the Clip window, you can see a dark border along the bottom and left edges of the clip. Borders are frequently caused by video noise during the capture process. You can remove the border by cropping the edges of the clip with the Crop filter.

1 Select the Crop filter from the Available list; then click Add. The Cropping Settings dialog box appears.



The dialog box contains a preview image from the clip and slider controls for trimming unwanted pixels from the edges of the clip. Note that the preview of the clip shows the effects of the Hue & Saturation filter.

2 Select the Pixels option, and then drag the Bottom slider to the right until it reads 2 (pixels). Do the same with the Left slider. This crops the image by 2 pixels on the bottom and left sides. (Adobe Premiere resizes the cropped clip to its original frame size.)

3 Click OK to close the Cropping Settings dialog box; then click OK to close the Filters dialog box.

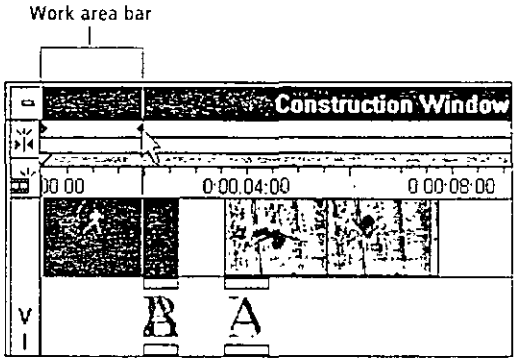
The program adds a blue line at the top of the clip in the Construction window to indicate that one or more filters have been applied.

Use the Preview command to preview the transitions and filter effects

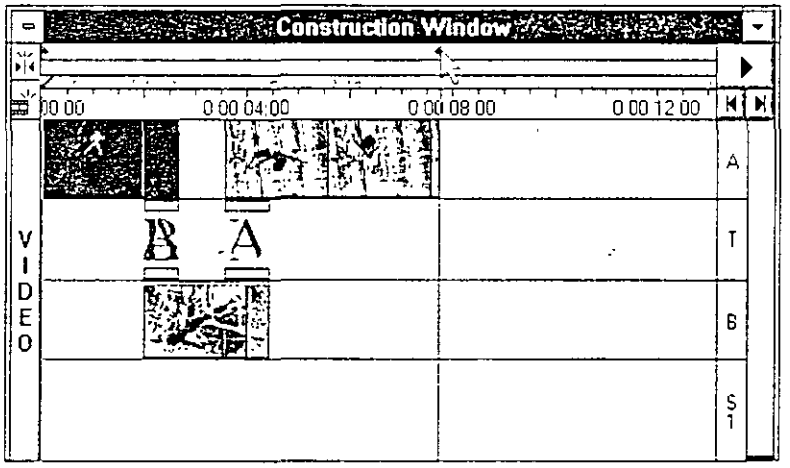
The Preview command provides a more accurate way to preview than dragging through the time ruler. You specify which part of the Construction window is previewed by positioning the yellow bar at the top of the window. All clips, transitions, and filter effects located beneath the yellow work area bar are previewed when you choose the Preview command.

1 Save the project by choosing Save from the File menu (Ctrl+S) and typing a name for the project. You cannot preview an unsaved project.

2 Position the pointer over the red triangle at the right edge of the yellow bar.



3 Click and drag to the right until the right edge of the yellow bar aligns with the right edge of the *Overspin* clip on track A.



4 Choose Preview from the Project menu, or press Return.

Adobe Premiere displays the Building Preview dialog box and gives a time estimate for compiling the preview. After a few moments, the preview plays in the Preview window, showing the *Spotlite* clip, the *Twirl* clip with the filters applied, and the two transitions.

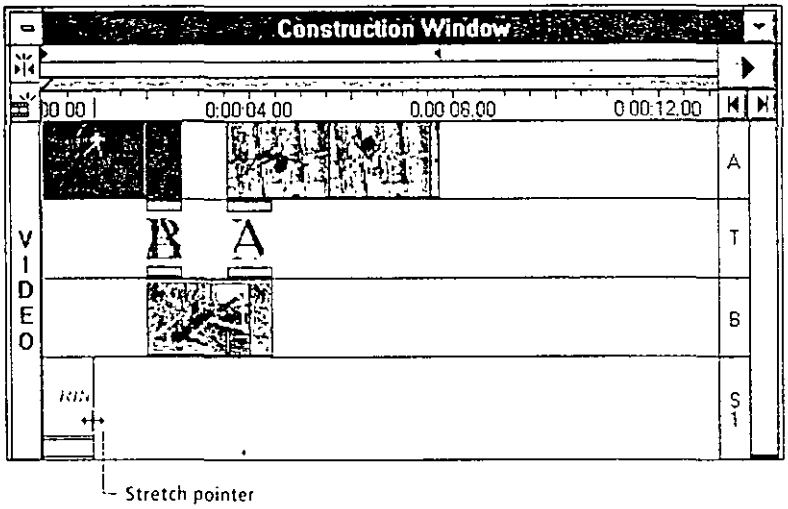
5 Press Return to see the preview again. This time, you don't have to wait for the preview to be built.

Add a superimposed title to the S1 track

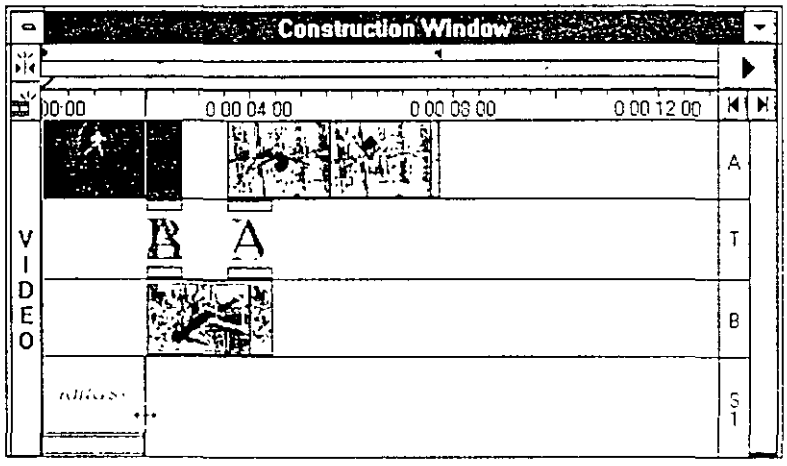
Adobe Premiere treats titles as clips. They are usually added to a superimpose (S) track so that they can be superimposed, or *keyed*, over a movie clip. You can change the duration of a title clip by choosing Duration from the Clip menu or by dragging the edges of the clip in the Construction window.

1 Drag the *Circus.ptl* clip from the Project window onto track S1 so that the left edge of the clip aligns with the beginning of the track.

2 Position the pointer over the right edge of the *Circus.ptl* clip. The pointer changes into a stretch pointer.



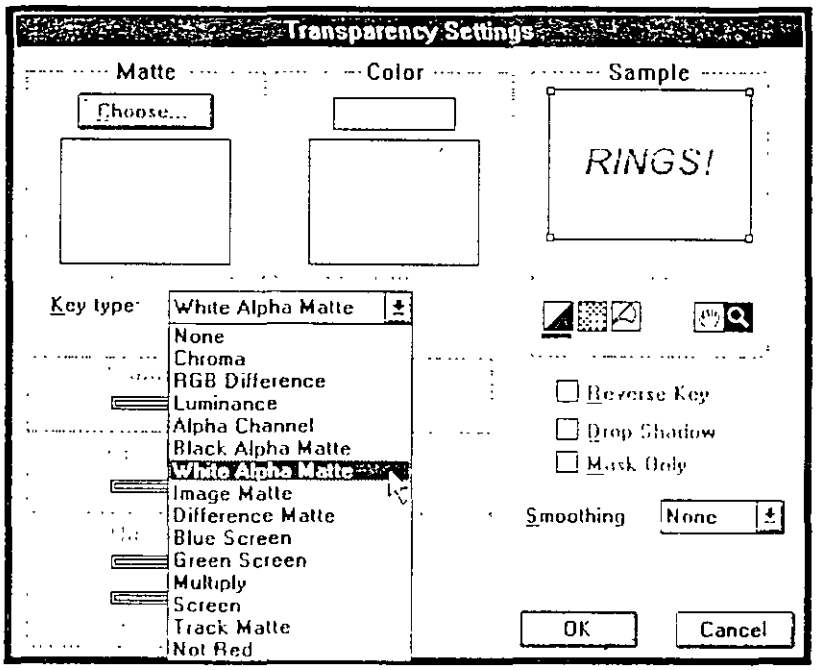
3 Drag the edge of the clip until it aligns with the left edge of the *Twirl* clip on track B. This extends the duration of the title clip to approximately 2 seconds.



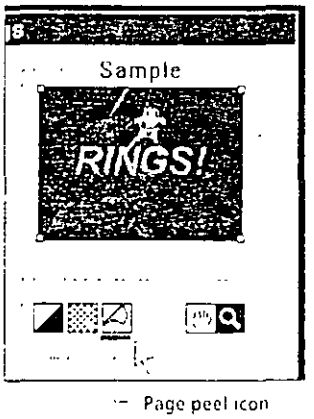
4 With the *Circus.ptl* clip selected in the Construction window, choose Transparency from the Clip menu. The Transparency Settings dialog box appears.

You can also position the pointer over the clip and click the right mouse button to display the Construction window pop-up menu. Choose Transparency from the pop-up menu.

5 To key the title against the background image of the *Spotlite* clip, choose White Alpha Matte from the Key Type drop-down list. Adobe Premiere uses the title's existing alpha channel to create a mask for superimposition. For more information on working with superimpositions, see "Superimposing Clips" on page 175.



6 To see a preview of the title over the actual background image, click the page peel icon under the Sample box.



The title is shown superimposed over the first frame of the *Spotlite* clip.

7 Click OK.

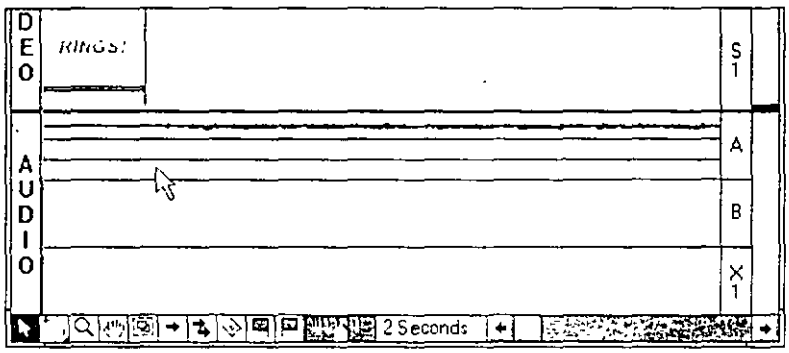
Note: The Circus.ptl *clip was created with the Adobe Premiere Titler. For information on using the Titler, see "Creating Titles" on page 189.*

Add sound to the movie

You add sound to a movie by dragging audio clips onto the audio tracks in the Construction window.

1 Drag the thumbnail of the *Circus.wav* clip from the Project window onto audio track A in the lower half of the Construction window.

2 Align the left edge of the audio clip with the left edge of the Construction window.



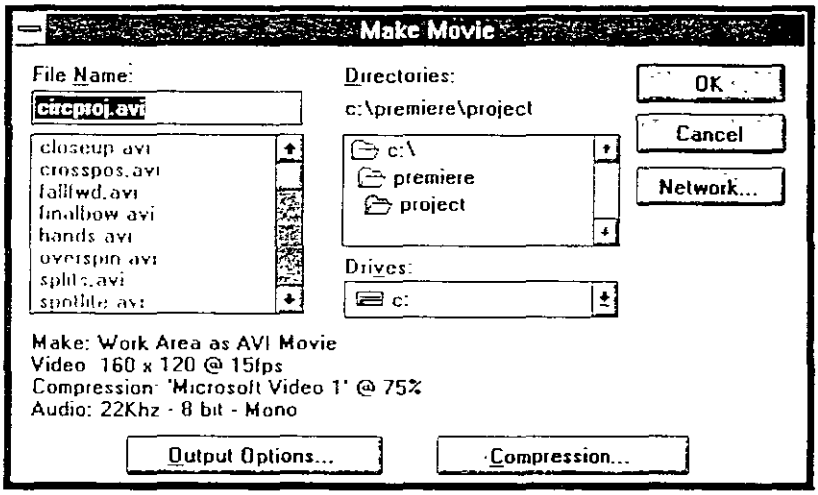
3 To preview your movie with sound, adjust the yellow work area bar to select the part of the movie you want to preview, and press Return.

Compile and play the final movie

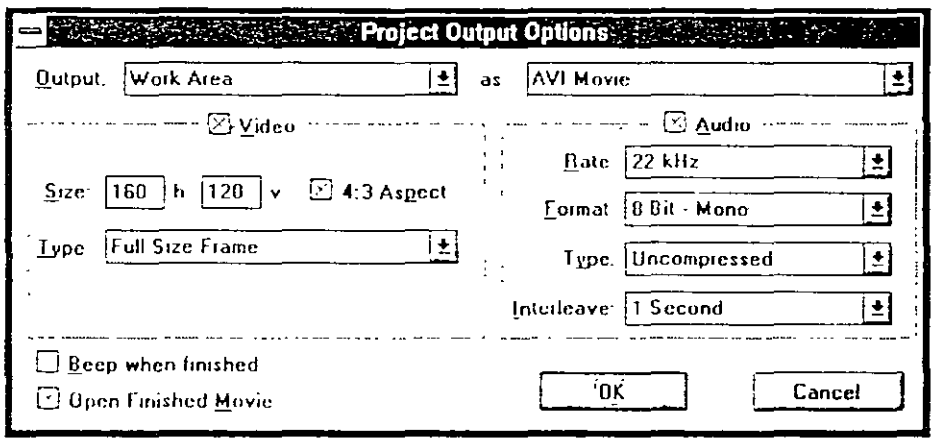
When you have finished assembling clips in the Construction window and are satisfied with the previewed results, you are ready for the program to create, or *compile*, the final movie file. You can compile a movie into the Video for Windows file format (*.avi*) or in the QuickTime for Windows file format (*.mov*).

1 Save the changes you have made to the project by choosing Save from the File menu (Ctrl+S). It's always a good idea to save your project often as you work.

2 Choose Make Movie from the Make menu (Alt+K). The Make Movie dialog box appears.



3 Click Output Options. The Project Output Options dialog box appears.



This dialog box lets you change characteristics of the final movie, including size, frame rate, compression type, and format. See Chapter 8, "Compiling and Videotaping Movies," for a complete description of output options.

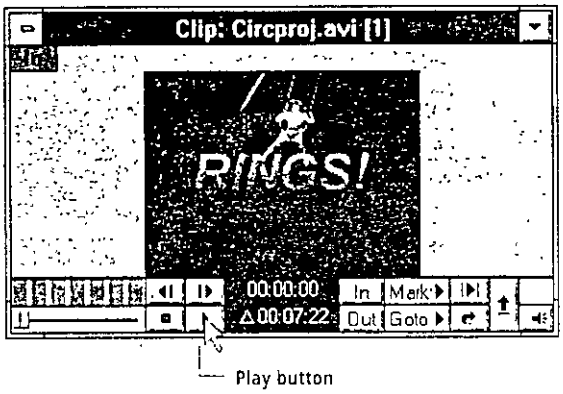
4 Make sure that the Open Finished Movie option at the bottom of the dialog box is selected. This option tells the program to open the movie when it has finished compiling and saving the movie.

5 Leave the other options at their current settings (these were set when you chose a project preset), and click OK.

6 Name the movie in the Make Movie dialog box, and click OK. A progress bar appears while Adobe Premiere compiles the movie.

When the movie has been compiled and saved, Adobe Premiere opens the movie in a Clip window.

7 To play the movie, press the Play button in the Clip window.



Play the movie using Print to Video

You can use the Print to Video command to play a movie in the center of your screen, with the rest of the screen blacked out. Print to Video is also used to output a finished movie to videotape. For information on making videotapes with Adobe Premiere, see Chapter 8, "Compiling and Videotaping Movies."

1 Click the Clip window to make sure that it is the active window.

2 Choose Export > Print to Video from the File menu (Ctrl+M). The Print to Video dialog box appears.

3 Leave the options as they are, and click OK. The screen goes blank for 1 second, and then the movie plays in the center of the screen.

The Adobe Premiere program disks include a sample project and its clips, which you can open and make into a movie. You should look through this guide to familiarize yourself with Adobe Premiere's features; then examine the sample project and make a movie to learn more about how Adobe Premiere handles clips, transitions, and superimposed images.

If you have the Adobe Premiere deluxe CD-ROM and a CD-ROM drive, you can also explore the sample movies and the expert tips and techniques that are included on the CD-ROM. For more information about the deluxe CD-ROM, see *Adobe Premiere Getting Started*.

Chapter

2

Chapter 2: Assembling an Adobe Premiere Movie

This chapter describes how to start an Adobe Premiere project and how to work with the Project and the Construction windows to assemble a movie. It also introduces some tools to help keep your clips and editing session organized. The basic approach to assembling a movie consists of importing clips into the Project window and assembling them in the Construction window. As you work in the Construction window, you can preview how the movie will play. Depending on the type of movie you want to create, you can perform simple or advanced editing operations.

As you read this chapter and the following chapters on previewing, creating transitions, special effects, and superimpositions, keep in mind that there is no absolute order in which tasks must be performed. Once you are familiar with the various Adobe Premiere windows, you will be able to decide at which point you want to perform a given task.

PLANNING THE MOVIE

Before creating a movie with Adobe Premiere, you may want to write a simple description of the sequence of major actions, or *shots*, in the movie. You may also want to create a series of sketches, called a *storyboard*, that outlines the beginning, transitions, special effects, sound, and ending of the movie.

Next, decide what source files, or *clips*, you want to include in your movie. For example, an Adobe Premiere movie might include a portion of a movie (a *movie clip*), a sampled recording (an *audio clip*), and an Adobe Photoshop or a bitmapped image.

Finally, decide how your movie will be played. For example, you can output the movie to videotape for playback on tape decks, compile the movie as a Video for Windows or QuickTime movie for playback from a CD or directly on a desktop computer, or use the movie to generate an Edit Decision List for online editing of source videotape in a post-production studio. Knowing how your movie will be played back will help you decide what compression settings and preview options to use while you are editing your movie.

HOW ADOBE PREMIERE WORKS WITH FILES

When you import a clip into an Adobe Premiere project, the source file does *not* become part of your Adobe Premiere project. The actual files can take substantial quantities of memory, which would make working with them difficult. Instead, an Adobe Premiere clip contains a pointer to the source file stored on your hard disk. The clip behaves as if it were

the source video or audio recording, but it is actually a sample, or a set of *thumbnails*, of the source file. You work exclusively with the thumbnails. If other users have access to your source files (on a hard drive or on a network), they will be unable to use or manipulate them while you are working with them in Adobe Premiere.

Note: *Because a clip is only a reference to its source file, do not throw away the source files while you are using them as clips in an Adobe Premiere project. Once you have used the Make Movie command to build a movie, you can discard the source files if you do not plan to continue editing the project.*

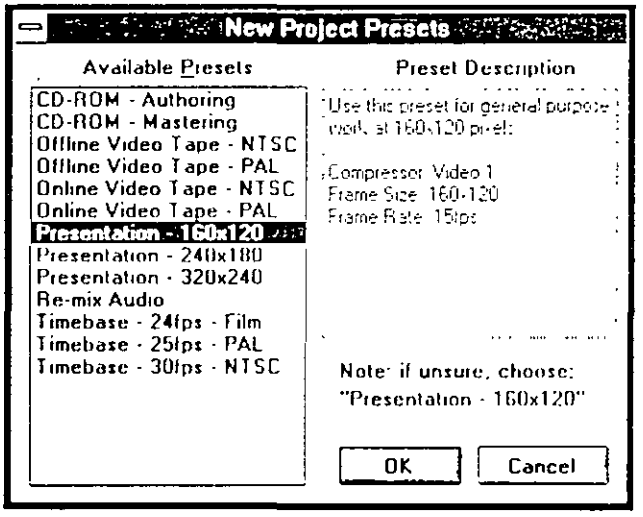
WORKING WITH PROJECTS

Once you have decided which clips you want to use in your movie, you are ready to create a new project. A project is analogous to a road map of your movie. All of your editing decisions are saved in the project.

You can only have one Adobe Premiere project open at a time. You start a new project by choosing New > Project from the File menu. This procedure is presented in "Create a New Project and Import Clips" on page 5.

Selecting a project preset

To start a new project, you must select a preset. Presets specify the project time base, movie frame rate, compression scheme, preview options, and output options for the project. Each new project opens with the New Project Presets dialog box.



Each available preset is optimized for a particular type of project, such as off-line editing, outputting to video tape, or creating a CD. Adobe Premiere comes equipped with several presets, which you can edit or use as the basis for new presets. You can see a short description of each preset by clicking in the list. All settings can be changed once the project has been created.

Loading or modifying project presets

You can load any existing preset into an open project. The project will be updated to reflect all settings in the new preset. In addition, you can modify existing project presets for later use when opening new projects.

To load an existing preset:

1 Choose Presets from the Make menu. The Presets dialog box appears.

2 Select an available preset from the right column. A description of the preset appears in the lower-right corner of the dialog box.

3 To load the selected preset into the project, click Load.

4 Click OK. The current settings for the project are updated.

To add or modify a preset:

1 Choose Presets from the Make menu. The Presets dialog box appears.

2 To base the new or modified preset on an existing preset, load the preset using the preceding procedure.

3 To change the current settings listed on the left side of the dialog box, use the Time Base, Compression, Output Options, and Preview Options buttons.

For more information on output and compression options, see Chapter 8, "Compiling and Videotaping Movies." For more information on preview options, see Chapter 4, "Previewing a Movie."

4 Click Save. The Preset Name dialog box appears.

5 Enter a name and description for the preset. Use a new name if you are adding a new preset.

6 Click OK. The preset is modified or added to the Available Presets list.

7 Click OK in the Presets dialog box. The current settings for the project are updated.

Setting a project's time base

Every project has a *time base*. The time base determines how Adobe Premiere interprets imported clips and lets the program know how many frames make 1 second of a movie. The time base is expressed as a rate, but has nothing to do with the actual playback rate of your movie. (The playback rate is determined by the value you specify in the Compression Settings dialog box and by the limitations of the target platform.)

The time base affects the way clips are represented in the Project, Clip, and Construction windows. For example, the tick marks in the Construction window's time ruler reflect the value of the time base. Since there are several standards in use today, specifying the one you want Adobe Premiere to use ensures that you and Adobe Premiere are measuring the duration of clips in the same way.

You initially set the time base when you choose the preset for a new project, as described in the preceding section. You can also change the time base for a project by clicking the Time Base button in the Presets dialog box. The time base can be set to the following rates:

- 29.97 frames per second (fps), the National Television Standards Committee (NTSC) standard, which is used for broadcast-quality videotape
- 30 fps, a rounded version of NTSC video, which is sometimes used for non-broadcast videotape
- 25 fps, the European television standard
- 24 fps, the rate at which film is projected

When setting the time base for a project, you should consider the frame rate of your final movie. When you compile your final movie, Adobe Premiere interpolates data from the project frame rate into the compiled movie frame rate. If your final movie will be compiled at a different frame rate than the time base, you should select a time base that is a multiple of the frame rate to ensure that data is not lost during interpolation. For example, if you want to output a final movie at 15 fps, you should set the time base to 30 fps because it is a multiple of 15. If you want to output a final movie at 12 fps, set the time base to 24 fps.

Saving projects

Saving a project saves all of your editing decisions and pointers to source clips. It also saves the last arrangement of the program's windows. It is a good idea to save your projects frequently as you work with them.

To work with a project again, all of the original source material must be available. To avoid having to relocate your source files each time you open a project, you should not move or rename the project's source clips or preview files.

Opening existing projects

You open an existing Adobe Premiere project by choosing Open from the File menu or by double-clicking the file in the File Manager. Adobe Premiere projects have a *.ppj* filename extension.

Upon opening an existing project, you may be asked to locate some of the clips or preview files associated with the project. If you have changed the file names or moved the files, use the scroll lists in the Locate File dialog to locate and select the files. You can ignore a file by clicking Skip in the dialog box, or ignore all missing files by holding down Ctrl and clicking Skip. Adobe Premiere then opens the project with the available files. You will have to regenerate any missing preview files during the Preview or Make Movie operations.

Merging projects

Adobe Premiere lets you add the contents of an existing project to the current project. This feature allows you to break up a large project into smaller, more manageable pieces and then merge the individual pieces back together when you are ready to assemble your movie. You can add a project to the beginning or end of the current project, or insert the project at the edit line.

When you merge a project, its clips are added to the Project window in a folder, and its assembled clips are added to the Construction window at the location you specified. All of the merged project's special effects (transitions, filters, motion settings, and so on) are also added. If additional tracks are required in the Construction window, they too are added.

To merge a project with the current project:

1 Choose Import > Project from the File menu. The Import dialog box appears.

2 Select the project you want to merge, and click OK. The Import Project dialog box appears.

3 To specify where you want the project added to the current project, select Beginning, Edit Line, or End, and click OK.

If you add the project at the edit line, the effect will be the same as performing an insert edit. All unlocked tracks are split at the edit line, and their contents shift to the right to accommodate the added project. For more information on insert editing, see "Performing Insert and Overlay Edits" on page 91.

Trimming projects

As you work on a project, you set new in points and out points for clips. (For information on setting in and out points, see "Trimming Clips" on page 76.) Your project may end up with many segments that are a fraction of the size of their source clips. The project could

also use several segments from the same source clip but in different locations. Because video clips can take up large amounts of hard disk space, you may want to trim the project so that unused frames are removed. Project trimming is especially useful for archiving projects.

When you trim a project, Adobe Premiere creates a copy of the project. In the new project, each clip's original in and out points become the new beginning and ending of the clip, respectively. The program also creates trimmed copies of the source clips. You can preserve a few seconds of frames at the beginning and end of each trimmed clip.

Note: *Instead of creating trimmed copies of the project's clips, you can create a batch list for redigitizing trimmed clips. Doing so is especially useful if you used low-resolution clips for the initial editing. For information on redigitizing low-resolution clips, see "Using Low-Resolution Clips to Improve Performance" on page 42.*

To trim a project:

1 Make the Project window or Construction window active.

2 Choose Tools > Project Trimmer from the File menu. The Project Trimmer dialog box appears.

3 Select Copy Trimmed Source Files, and deselect Create Trimmed Batch List.

Adobe Premiere stores the trimmed copies in the same directories as the source clips and appends numbers to the clip names. For example, if a project contains three different segments from a source clip named *dancers.avi*, the Project Trimmer creates three trimmed clips named *dancer_1.avi*, *dancer_2.avi*, and *dancer_3.avi*. If necessary, the filenames of the clips are truncated to allow numbers to be appended.

4 To preserve a few extra seconds (*handles*) at the beginning and end of each trimmed clip, enter the number of seconds you want to preserve in the Keep Handles area.

Creating handles lets you later make minor editing changes in the newly trimmed project. It is more important to create handles when creating a batch list for redigitizing than for basic project trimming. If there is not enough source material to create handles, the Keep Handles option is ignored.

5 Click Create Project. The standard Save dialog box appears.

6 Name and store the new project. The project uses the new trimmed clips with the numbered names.

Note: *If the project uses two segments from the same source clip and their in and out points overlap, the Project Trimmer creates a single clip for those two segments. Similarly, if you specify handles and the handles of two segments in a clip overlap, the Project Trimmer creates a single clip for those two segments.*

Exporting file lists

Adobe Premiere lets you create a list of the names of all clips used in a project. A file list is a quick way to scan the contents of a large project. The list displays the clip names in the order in which they appear in the Project window. Clip folders and their contents are also included in the list.

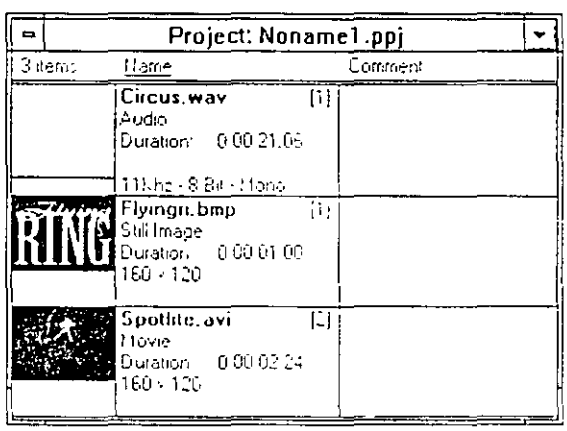
To export a file list:

1 Choose Export > File List from the File menu.

2 Use the standard Save dialog box that appears to store the list. File lists are saved as text (*.txt*) files.

IMPORTING AND OPENING CLIPS

When a new project is created, Adobe Premiere opens a new, untitled Project window. Clips must be imported before they can be used in a project. All imported clips are placed in the Project window.



There are several ways to import clips into a project. You can import a single clip, multiple clips, or an entire directory of clips directly into the Project window. If you want to examine a clip before importing it into the project, you can first open the clip in a Clip window and then move the clip to the Project or Construction window. You can import multiple copies of a clip displayed in a Clip window.

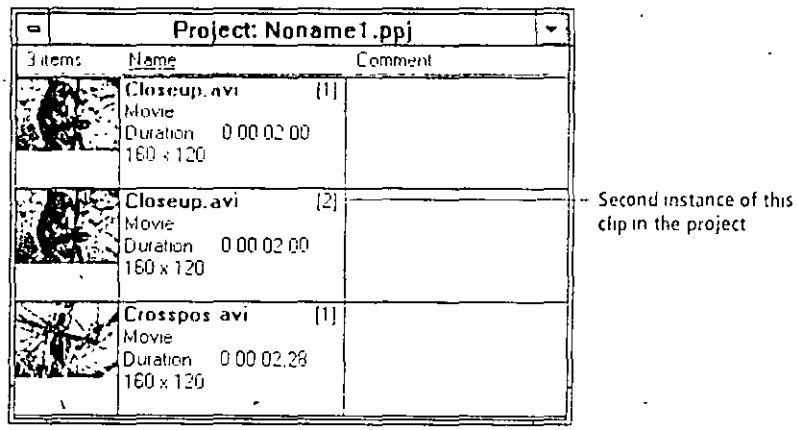
To import a single clip into the Project window:

1 Choose Import > File from the File menu. The Import dialog box appears.

2 Locate and select the clip you want to import. If the clip is a movie or a bitmapped (*.bmp*) image, a small preview of the clip appears in the dialog box. You can examine the preview by clicking the Play button below the preview.

3 Click OK to import the clip into the Project window.

Clips are arranged in alphabetical order in the Project window with the number 1 appearing after the name of the first clip. If the same clip is imported again, Adobe Premiere makes another entry in the Project window and assigns it the number 2. Each time the clip is imported, Adobe Premiere makes a new entry and numbers it in ascending sequential order.



To import multiple clips into the Project window:

1 Choose Import > File from the File menu. The Import dialog box appears.

2 Hold down Ctrl and select the clips you want to import. You can also select the first clip and drag through the following clips to select a group of clips.

3 Click OK to import the clips into the Project window.

To import a directory of clips into the Project window:

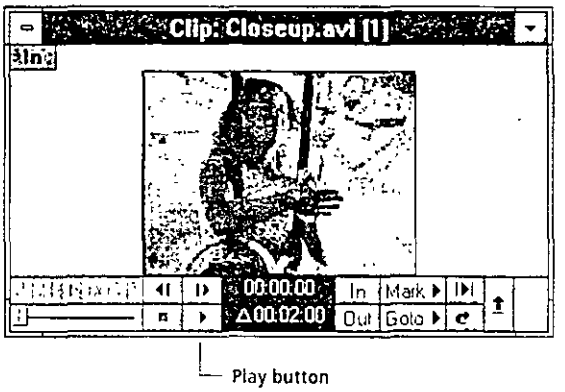
1 Choose Import > Directory from the File menu. The Select Directory dialog box appears.

2 Locate the directory containing the desired clips, and click OK.

All the clips in the selected directory are imported into the Project window. Any subdirectories within the directory will not be imported.

To examine a clip and then add it to the project:

1 Use the Open command in the File menu to open the clip you want to examine. The clip appears in a Clip window.



2 To examine movie and audio clips in the Clip window, click the Play button. For information on playing clips in the Clip window, see "Using the Clip Window" on page 68.

3 To import the clip, drag it from the Clip window into the Project or Construction window. You can also drag a clip directly into a Library window or a Sequence window.

4 To import a copy of the clip, hold down the Alt key and drag it to the Project or Construction window, or choose Add This Clip from the Project menu to import a copy of the clip to the Project window.

Importing copies of clips is useful when you want to use multiple segments from the same source clip. To use multiple segments, set the in and out points for the first segment in the Clip window, and then import the segment as a copy. Repeat the process for each subsequent segment. For information on setting in and out points, see "Trimming Clips" on page 76.

Note: *You can also use one of the Copy to Construction commands to perform an insert edit from the Clip window to the Construction window. For information on insert editing, see "Performing Insert and Overlay Edits" on page 91.*

Compatible formats for clips

Adobe Premiere accepts source files in a variety of formats, as shown in the following table. Compatible formats include those for movie files, animation files, still-image files, and audio files.

TYPE OF CLIP	FILE FORMATS
Movie	Video for Windows (*.avi*) QuickTime for Windows (*.mov*) FilmStrip (*.flm*)
Animation	AutoDesk Animator (*.flc, .fli*) AutoDesk 3D Studio (*.flc, .fli*) #Targa (*.tga*) #Windows bitmap (*.bmp, .rle, .dib*) #TIFF (*.tif*)
Still Image	Adobe Photoshop (*.psd*) Windows bitmap (*.bmp, .rle, .dib*) Macintosh PICT (*.pic, .pct*) Windows Metafile (*.wmf*) TIFF (*.tif*) PCX (*.pcx*) Targa (*.tga*)
Audio	Audio Interchange (*.aif*) Windows Waveform (*.wav*)

The file formats preceded by a pound sign (#) represent a series of numbered images. When Adobe Premiere imports a sequence of numbered files, each numbered file represents a single frame of a clip, all of which are combined to create a single clip. Some utilities and programs, such as Adobe Dimensions™ and MacroMedia Director™, can generate a series of numbered still-image files that represent the sequence of single frames used to create an animation.

You can use a video digitizer to capture video and make Video for Windows or QuickTime movie files, and use animation programs to make FLC/FLI files or a series of numbered files. You can use graphics applications to make bitmapped, TIFF, or Macintosh PICT still-image files, and use presentation programs to convert spreadsheet charts and graphs to drawings. You can scan photos, line art, charts, and other visuals with a high-quality scanner, and then convert the scanned images to bitmapped or Adobe Photoshop files.

If your computer has a sound card and an audio input device, you can record and edit sounds with sound-editing programs that generate waveform (*.wav*) files, such as Adobe Premiere. Most sound cards include an audio capture program for creating sound files. In addition, many video capture cards digitize sound when capturing a movie, but your computer must still have a separate sound card to play and edit sound files.

Opening numbered still-image files

To open a series of numbered bitmapped (*.bmp, .dib*, or *.rle*), Targa (*.tga*), or TIFF (*.tif*) files, the filenames must have the correct file extension for the type of sequence. In addition, the filenames must all contain an equal number of digits—for example, *file000.bmp*, *file001.bmp*, and so on.

To open numbered still-image files and compile them into a single clip:

1 Choose Import or Open from the File menu.

2 Select Bitmap Sequence, TIFF Sequence, or Targa Sequence from the List Files of Type drop-down list.

3 Select the first numbered image in the series, and click OK.

The images are compiled and appear as a single clip in the Project or Clip window. By default, the images are assigned a frame rate of 1 fps. You can change the frame rate using the Speed command in the Clip menu. For a frame rate of 30 fps, enter 3000 percent for the new rate in the Clip Speed dialog box; for 24 fps, enter 2400 percent; for 15 fps, enter 1500 percent.

Opening QuickTime for Macintosh files

In the Windows version of Adobe Premiere, you can open a QuickTime movie created on a Macintosh computer if the movie was saved as a *flattened, self-contained* QuickTime file, and if the file was converted to a DOS file with the *.mov* extension. Flattening a QuickTime movie when it is saved appends the resource fork to the data fork and thus consolidates the movie into one file. Creating a self-contained QuickTime movie consolidates all of the video and audio data into one file.

In the Macintosh version of Adobe Premiere, you can export a flattened QuickTime movie by choosing Export > Flattened Movie from the File menu.

To open a flattened QuickTime file in the Windows version of Adobe Premiere:

1 Choose Import or Open from the File menu.

2 Select a movie with the *.mov* file extension and click OK.

WORKING WITH CLIPS

This section describes many of the options for working with clips in Adobe Premiere projects. You can set the image size for clips, rename clips, locate clips in other windows, delete unused clips, create libraries of frequently used clips, and use miniatures and low-resolution clips to improve performance.

Setting the image size for movie and still-image clips

The Adobe Premiere output image size for movies can vary from 60-by-45 pixels to 2000-by-2000 pixels, with a resolution of 72 pixels per inch (ppi). The output image size is initially set in the project preset, and can be changed in the Output Options dialog box. Before importing or adding any movie and still-image clips to an Adobe Premiere project, it is a good practice to match their sizes to the output size of your movie. For more information on output image sizes, see Chapter 8, "Compiling and Videotaping Movies."

You can resize still images using Adobe Photoshop and then import them into Adobe Premiere. If you need to resize a movie or still-image clip after it has been imported, you can apply the Resize filter. This filter lets you scale an image up or down to match the output frame size of the movie. For more information on the Resize filter, see "Movie and Still-Image Filters" on page 147.

By default, Adobe Premiere adjusts the height-to-width ratio, or *aspect ratio*, of an image as needed to match the output frame dimensions. This can result in an undesirable distortion of an image. You can lock the aspect ratio for any clip in the Project or Construction window by selecting the clip and choosing Maintain Aspect Ratio from the Clip menu. Adobe Premiere will maintain the height-to-width ratio of the image, regardless of image size. For still-image clips, you can specify Lock Aspect Ratio as a default setting by choosing Preferences > Still Image from the File menu.

Correcting the duration of frames in a clip

All video tape decks can potentially introduce frame rate errors into a clip during capture. In the Adobe Premiere program, it is important that all frames in a clip have the correct duration. Before importing clips, you can use the Conform AVI Movie command to ensure that all captured frames in the clips have exactly the same duration. You can also conform clips during capture (for more information, see "Selecting Recording Options" on page 235).

To correct the duration of frames:

1 Choose Tools > Conform AVI Movie from the File menu. The standard Open dialog box appears.

2 Select the clip file or directory of clips that you want to correct, and click OK. The Conform Movie dialog box appears, displaying the movie's current frame rate.

3 From the drop-down list, choose the frame rate to which you want to conform the movie, and click Conform.

Renaming clips

You can rename a clip by giving it a name alias. This is especially useful when you have used a clip more than once in a movie, or have duplicated a clip and set new in and out points. Giving the clip a name alias helps to avoid confusion when viewing duplicated clips in the Project and Construction windows.

A clip with an alias has an italicized clip name when viewed in the Project and Construction windows. Creating a name alias does not rename the file on your hard disk. You can read the original filename of a clip at any time by selecting the clip and choosing Name Alias from the Clip menu. Clip name aliases in Premiere can have up to 30 characters and can include spaces and uppercase and lowercase characters.

To assign a name alias:

1 Select the clip in the Project or Construction window, or open the clip in a Clip window. You can select multiple clips in the Project or Construction window.

2 Choose Name Alias from the Clip menu. The Set Clip Name Alias dialog box appears.

3 Specify a name alias for the clip, and click OK. If you selected multiple clips, the Set Clip Name Alias dialog box reappears for each clip.

To remove a name alias:

1 Select the clip in the Project or Construction window, or open the clip in a Clip window.

2 Choose Name Alias from the Clip menu. The Set Clip Name Alias dialog box appears.

3 Click None to remove the name alias.

Finding clips in other windows

When you are working with a clip in one window, you can use the Find Clip command to see where the clip appears in another window.

To find a clip in another window:

1 Select the clip in the Construction, Project, or Clip window.

2 Choose Find Clip from the Clip menu. The program finds clips as follows:

- If the Clip window is active, the corresponding clip in the Project window or Folder window is highlighted.
- If the Project window is active, the corresponding clip in the Construction window is highlighted.
- If the Construction window is active, the corresponding clip in the Project window or Folder window is highlighted.
- If a virtual clip is selected, its source will be highlighted in the Construction window or Folder window. For information on virtual clips, see "Working with Virtual Clips" on page 101.

Creating libraries

An Adobe Premiere library stores clips from one or several projects. For example, you may want to store all the clips from one project in a library, or you may want to store frequently used clips in a library rather than open each clip separately as you need it. Once you have created and saved a library, you can open it along with any project. All attributes, such as markers and in and out points, are saved with the clips you place in a library.

You can search for clips in the Library window based on their names or on their attached comments and labels. You search for clips in the Library window in the same way as you search for clips in the Project window. For information on searching the Project window, see "Locating Clips in the Project Window" on page 48.

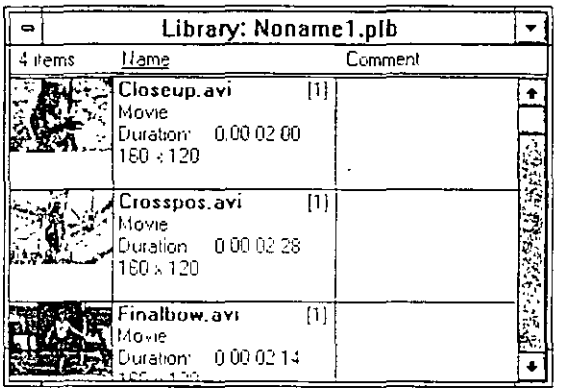
To create a library:

1 Choose New > Library from the File menu. An untitled Library window appears.

2 Import clips into the Library window using one of the following methods:

- With the Library window active, choose the Import command from the File menu.
- Drag the desired clips from the Project or Clip window into the Library window.

- Copy and paste clips from the Construction window into the Library window.



3 Use the Save command in the File menu to save the library. Libraries are given a *.plb* file extension.

To open a library:

Use the Open command on the File menu to open a library. Libraries have a *.plb* file extension.

To change the display of the Library window:

Choose Library Window Options from the Windows menu or click the right mouse button on the Library Window title bar. You change icon sizes for the Library window in the same way you change them for the Project window. For information on changing the display of the Project window, see "Changing the Project Window Display" on page 46.

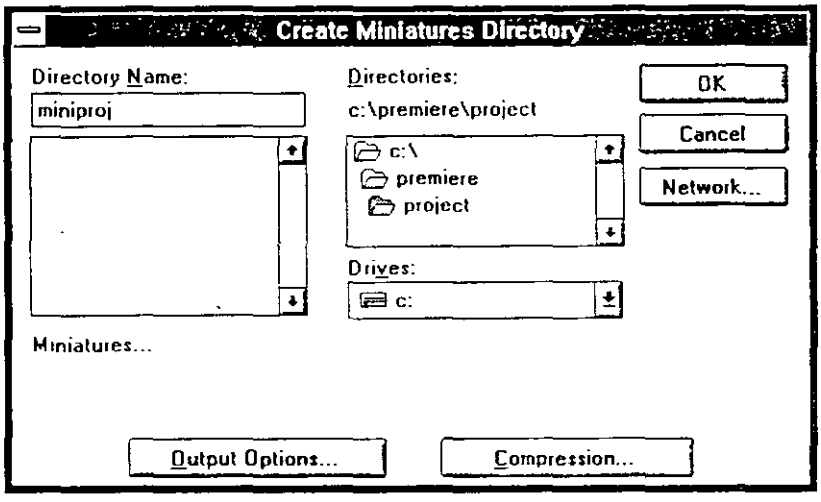
Making miniatures to improve performance

For better performance during editing and previewing, you can use the Miniatures feature to scale down the image size of your original clips. When you are ready to make the final version of the movie, you retrieve the original images using the Re-Find Files command. For more information, see "Replacing Miniatures and Low-Resolution Clips" on page 44.

To create a set of miniature clips:

1 Choose Tools > Miniatures from the File menu. The Select Directory dialog box appears.

2 Select the directory containing the source clips, and click OK. The Create Miniatures Directory dialog box appears.



3 To change the output options, click Output Options. For best results, select an image size between 120-by-90 pixels and 320-by-240 pixels. For more information on output options, see "Selecting Project Output Options" on page 205.

4 To change the compression options, click Compression. For information on compression options, see "Selecting Compression Options" on page 214.

5 Specify a name for the new Miniatures directory, and click OK.

The miniature clips are saved in the newly created directory, from which they can be imported or opened for use in your project. When you are ready to output the final movie, use the Re-Find Files command to retrieve the original files. For information on using the Re-Find Files command, see "Replacing Miniatures and Low-Resolution Clips" on page 44.

Using low-resolution clips to improve performance

You can save disk space and improve editing and previewing performance in Adobe Premiere by working with low-resolution clips and then redigitizing the clips at a higher resolution when you are ready to output the movie.

When working with low-resolution clips, you should store still images and any titles you create in separate folders from the video and audio clips—you can work with the still images at their final dimensions, and the titles are automatically resized when you compile the movie. Only the video and audio clips will need to be redigitized. For instructions on creating low-resolution clips, see the tip "Using Low-Resolution Clips to Construct a Movie" on page 278.

Before redigitizing, you use the Project Trimmer to create a batch list of the clips in your project. The batch list includes only those segments of each source clip that are actually used in the Construction window, based on the in and out points you have set. (For information on setting in and out points, see "Trimming Clips" on page 76.) Trimming the project can significantly decrease the size of your project, depending on how much editing you have done on the clips. The Project Trimmer also creates a copy of the project. The new project uses the trimmed clips that you will redigitize from the batch list.

You use the Batch Capture command to redigitize the trimmed clips in the batch list. To redigitize clips, the original source clips must have been recorded with timecode when they were captured. For more information on using Batch Capture, see "Batch Capturing with Device Control" on page 241.

To redigitize low-resolution clips at a higher resolution:

1. Make the Project window or Construction window active.

2. Choose Tools > Project Trimmer from the File menu. The Project Trimmer dialog box appears.

3. Select Create Trimmed Batch List, and deselect Copy Trimmed Source Files.

4. To preserve a small number of extra frames (handles) at the beginning and end of each trimmed clip, enter the number of seconds you want to preserve in the Keep Handles area.

Preserving handles is important when creating a batch list for redigitizing because they let you make minor in and out point adjustments later. You should preserve handles of at least 1 second.

5. Click Create Project. Use the first Save dialog box that appears to name and store the new project. Use the second Save dialog box to name and store the batch list.

6. Open the batch list.

The batch list appears in a Batch Capture window. The list includes only those parts of each source clip that are actually used in the Construction window. The new clip names are appended with numerical extensions. For example, if a project contains three different segments from a clip named *Dancers*, the batch list would include three trimmed clips named *Dancer_1, Dancer_2, and Dancer_3*. The new project that was created by the Project Trimmer will look for these clip names instead of the original ones.

Note: *If the project uses two segments from the same source clip, and their in and out points overlap, the batch list designates a single clip for those two segments. Similarly, if you specify handles, and the handles of two segments in a clip overlap, the batch list designates a single clip for those two segments.*

7 Adjust the recording options and settings for digitizing the clips at a larger size or resolution, using the commands in the Batch Capture menu. For more information on these commands, see "Capturing with Device Control" on page 238.

8 Make sure that your tape deck is connected to your computer, and click Capture in the Batch Capture window. You are asked to create a library for batch capture. Create the library on your fastest hard drive because Adobe Premiere will capture the clips using that drive. For more information on batch capture, see "Capturing Clips Using a Batch List" on page 243.

Adobe Premiere saves the clips in the batch list in the directory that contains the library. If this is the same directory that contains the original clips, you can open the new project that was created by the Project Trimmer, and the project will automatically use the newly digitized clips. If this is not the directory that contains your original clips, you will need to link the newly digitized clips to the project created by the Project Trimmer using the Re-find Files command. For more information on using the Re-find Files command, see the next section, "Replacing Miniatures and Low-Resolution Clips."

Replacing miniatures and low-resolution clips

The Re-Find Files command is used to replace miniature clips with their source clips, or to replace low-resolution clips with clips that have been redigitized at higher resolution. For more information, see the preceding sections, "Making Miniatures to Improve Performance" and "Using Low-Resolution Clips to Improve Performance."

To use the Re-Find Files command:

1 Save your project.

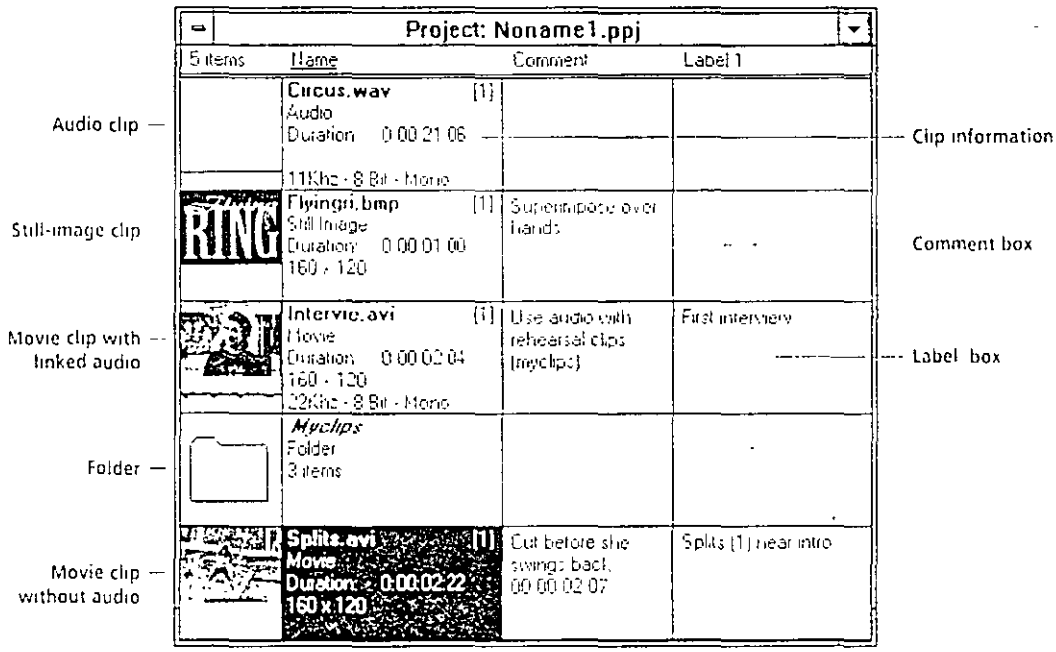
2 Choose Re-Find Files from the Project menu. The Re-Find Files dialog box appears.

3 Use the dialog box to locate and select the clip indicated at the top of the dialog box.

If you have placed all of the original clips in the same folder, Adobe Premiere automatically exchanges the miniature clips in the Project window and the Construction window with the original clips in the folder. If you have built your movie with miniatures from different directories, you will have to locate each directory individually. If you want to skip one clip and locate the next, click Skip in the Re-Find Files dialog box.

USING THE PROJECT WINDOW

Clips imported to a project appear in the Project window. Clips in the Project window can be organized in folders, which helps make large projects more manageable.



For each clip, the default Project window displays the name, a thumbnail, the general type, and the duration. The window also displays a Comment box, and two Label boxes.

- The thumbnails vary depending on the type of clip in the Project window. For a movie or animation clip, the thumbnail displays an approximation of the first frame of the clip. For an audio clip, the thumbnail is a sketch of a portion of the audio waveform. For a still image, the thumbnail displayed is an approximation of the image. If marker 0 is set in a clip, the thumbnail displays that frame.

- The clip type label may be "Movie," "Audio," "Still Image," "Filmstrip," "Background Matte," or "Title."

- The duration of a clip (how long a clip runs) is measured in the standard format approved by the Society of Motion Picture and Television Engineers (SMPTE), which is Hours:Minutes:Seconds:Frames. A clip with a duration of 0:00:05:15 plays for 5 seconds and 15 frames. At the rate of 30 frames per second, this clip would play for 5.5 seconds. For more information on setting the timecode, see "SMPTE Timecode" on page 284.

- The size of a movie frame or still-image clip is the image's dimensions measured in pixels; for audio clips, the Project window displays frequency in kilohertz, sample resolution, and whether the clip is mono or stereo.

• The Comment box and two Label boxes to the right of the clip name let you attach notes to a clip. For example, you may want to add information about the contents or quality of a clip that can't be represented by the thumbnail. To add a comment or a label, click the appropriate box and type the text you want associated with the clip. You can use the standard Windows Cut, Copy, Paste, and Clear commands to edit the text you enter.

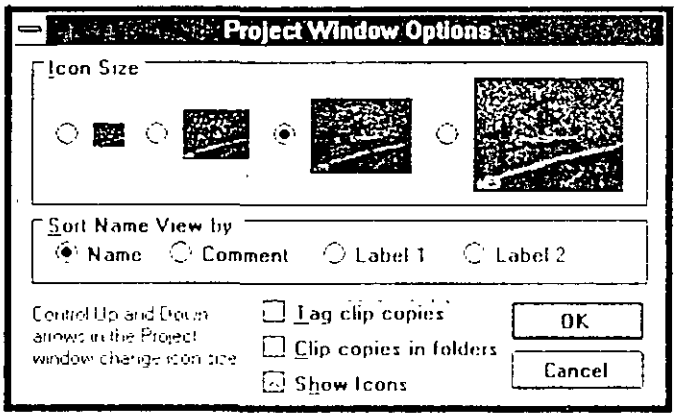
Clips are displayed in alphabetical order by name. They can also be alphabetized according to comments or labels. Grouping or prioritizing your clips with attached notes can make it easier to keep your project organized.

Changing the Project window display

You can vary how clips appear in the Project window by choosing among four thumbnail sizes. The default view uses medium thumbnails and displays clips by name, showing the type of clip and its duration.

To change the Project window display:

1 Make the Project window active, and choose Project Window Options from the Windows menu or click the right mouse button on the window title bar. The Project Window Options dialog box appears.



2 To select an icon size, click the appropriate button. If you want to turn off the display of thumbnails so that they appear in the Project window as gray boxes, deselect the Show Icons check box. Not displaying thumbnails speeds up access time when working in the Project window.

Note: *You can also toggle between views when the Project window is active by holding down the Ctrl key and using the Up and Down Arrow keys to change icon size.*

3 To specify how the clips in the Project window are sorted alphabetically, click Name, Comment, Label 1, or Label 2.

Note: You can also click on a column heading in the Project window (Name, Comment, Label 1, or Label 2) to sort the clips alphabetically.

4 To automatically identify copies in the Comment field, select the Tag Clip Copies option. When you copy and paste a clip in the Construction window, the clip is added to the Project window and identified as a copy in the Comment field.

5 To hide copies of clips in a project folder, select the Clip Copies in Folders option. When you copy and paste a clip in the Construction window, the clip is added to a new folder called Clip Copies in the Project window.

Using folders in the Project window

Clips in the Project window can be arranged in folders, just as files are arranged in folders in the File Manager. Project folders are particularly useful when you are working with a complex project that has scenes from many clips. Arranging the clips in a series of folders makes the project easier to manage.

To create a folder in the Project window:

1 Make the Project window active.

2 Choose Add Folder from the Project menu. The Folder Name dialog box appears.

3 Type a name and click OK.

To open a Folder window and add clips:

1 Double-click the folder you want to open. The Folder window appears, displaying the contents of the chosen folder.

2 Drag clips or other folders from the Project or Clip window to the Folder window. If you add a clip from a Clip window, Adobe Premiere creates a new copy of the clip in the folder. If the Folder window is not open, you can add a clip to a folder by dragging it over the folder icon in the Project window.

To change the display of the Folder window:

1 Open the Folder window.

2 Choose Folder Window Options from the Windows menu or click the right mouse button on the Folder window title bar. The Folder Window Options dialog box appears.

3 Change the display of the Folder window in exactly the same manner as for the Project window by choosing from four thumbnail sizes. For information on changing the display of the Project window, see "Changing the Project Window Display" on page 46.

Deleting clips and folders from the Project window

You can delete one or more of the clips or folders in the Project window if you don't want them in your project. You can also have Adobe Premiere delete all clips in the Project window that are not currently used in the Construction window. If you try to delete a clip that is currently in use in the Construction window, a warning indicates that the clip will be removed from both the Project and Construction windows.

To delete a clip or folder from the Project window:

1 Select the clip or folder you want to delete. Hold down the Ctrl key to select more than one clip or folder.

2 Press Delete, or choose Clear or Cut from the Edit menu. The clip or folder is deleted from the Project window and the Construction window.

Note: The Backspace key can be used interchangeably with the Delete key throughout this guide.

To delete all clips not currently in use:

1 Make the Project window active.

2 Choose Remove Unused from the Project menu.

Locating clips in the Project window

You can have Adobe Premiere search for clips in the Project window based on their names or on their attached comments and labels. For example, you can locate all clips with a common label, such as *Opening Scene*.

To locate clips in the Project window:

1 Click the Project window to make it active.

2 Choose Goto/Search from the Project menu. The Project/Library Search dialog box appears.

3 Select which columns in the Project window will be searched: Name, Comment, Label 1, or Label 2.

4 Type a character string to be used as an identifier in the search.

5 Choose one of the following search options:

• Click Find to locate and select the first clip in the Project window associated with the character string identifier; continue clicking Find to locate and select successive clips associated with the character string.

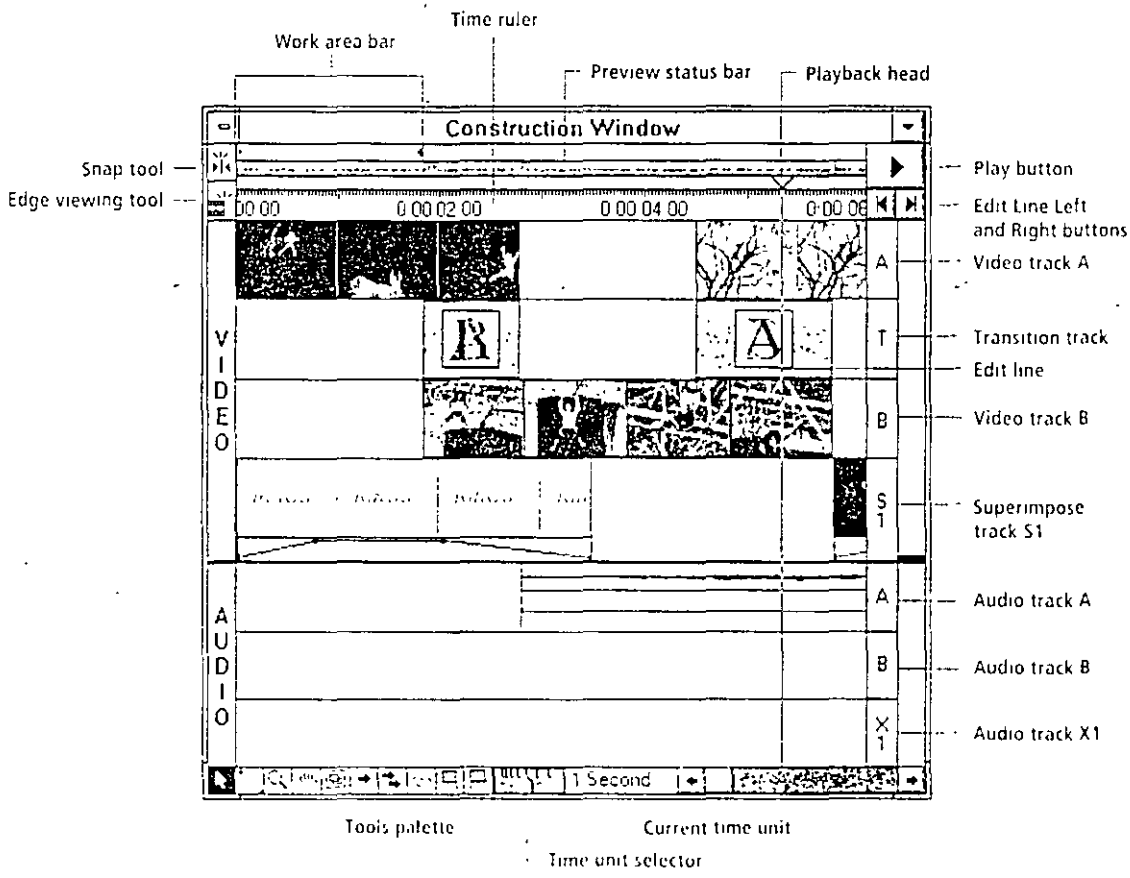
• Click Find All to locate and select all clips in the Project window associated with the character string identifier.

6 Click Done when you have completed your search.

USING THE CONSTRUCTION WINDOW

The Construction window displays all the clips in your movie from left to right, in the sequence in which they will appear when the movie is played. This window is Adobe Premiere's "cutting room," because it is here that you do the work of assembling clips and editing the movie.

The Construction window contains a time ruler for aligning clips, a tools palette for selecting and editing clips, and a variable number of tracks (the default is seven tracks).



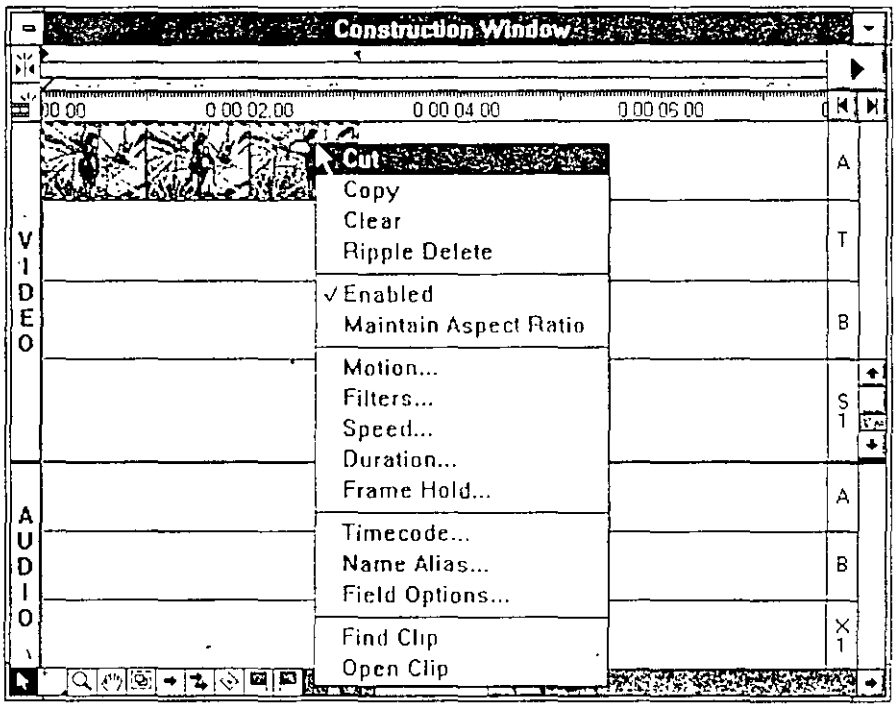
Traversing the Construction window

To traverse the Construction window, use the scroll bar at the bottom of the window. Press the Home key to display the beginning of the assembled movie or the start of the selected clip. Press the End key to display the end of the assembled movie or the end of the selected clip.

Using the Construction window pop-up menu

When the Construction window is active, clicking the right mouse button displays a pop-up menu. The contents of the pop-up menu varies depending on the pointer's location.

If the pointer is over a video track, the pop-up menu displays video-editing commands. If the pointer is over an audio track, the pop-up menu displays audio-editing commands. If the pointer is over a blank area, the pop-up menu displays the Ripple Delete command.



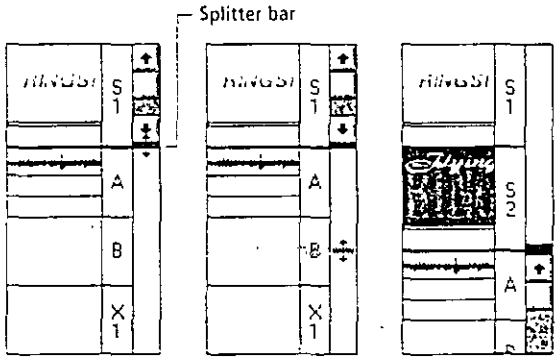
Changing the number of tracks in the Construction window

The Construction window can contain up to 99 video and 99 audio tracks. You set the number of tracks with the Add/Delete Tracks command in the Project menu. You can specify different numbers of video and audio tracks, but for each type, you can have no fewer than three tracks (the default setting).

Additional video tracks are added as superimpose (S) tracks. When video tracks are added, they are labeled sequentially from S2 to S97, depending on the number of tracks added. Similarly, audio tracks are labeled X2 to X97. When deleting tracks, Adobe Premiere removes those with the highest numbers in the Construction window. If you attempt to remove a track that has contents, you will be given a warning and be allowed to cancel the operation. Deleting tracks cannot be undone.

Viewing tracks

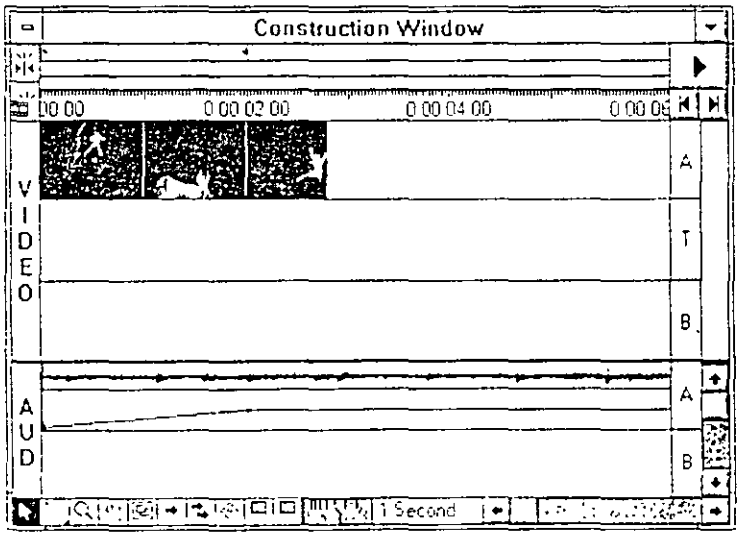
When working with a large number of tracks, you may have to enlarge the Construction window to see all of them. If you can't enlarge the window, you can scroll through the S and audio tracks using the scroll bars on the right side of the Construction window. The area of the Construction window allocated to video and audio tracks can be adjusted by dragging the splitter bar located between the two scroll bars.



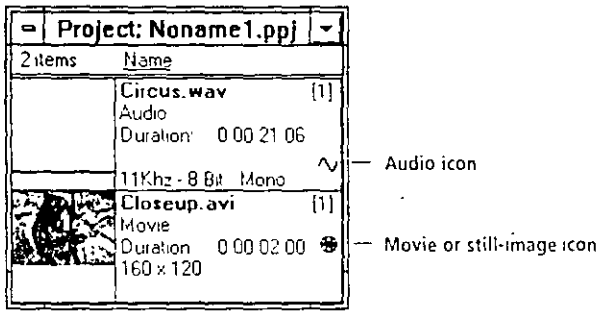
Adjusting the track display

Assembling clips in the Construction window

To assemble your clips in the Construction window, drag the thumbnail of each of the clips you want to use from the Project or Clip window onto a track in the Construction window. The clip type must correspond to the track type (for example, you cannot place an audio clip on a video track). Adobe Premiere places the clip in the Construction window when you release the mouse button.



A small icon appears in the clip's information box in the Project window to show that the clip is in use. The icon is a color wheel for a movie or still-image clip and a waveform for an audio clip. A linked clip displays both icons.



You can also add clips to the Construction window by performing an insert edit. An insert edit lets you set precise cut points and durations for clips as you insert new material. For information on performing insert editing, see "Performing Insert and Overlay Edits" on page 91.

To copy multiple clips from the Project window to the Construction window:

1 Click a clip to select it; then hold down the Ctrl key and click each additional clip you want included in the selection.

2 Drag the clips to the Construction window. Clips are placed on a single track in the order that they appear in the Project window.

To copy all clips from the Project window to the Construction window:

1 Choose Select All from the Edit menu.

2 Drag the clips to the Construction window. Clips are placed on a single track in the order that they appear in the Project window.

Using linked clips

If a clip contains both video and audio, it is called a *linked* clip. When you drag a linke clip to the Construction window, both the video and audio portions of the clip are pla on their appropriate tracks. For example, if you drag a linked clip onto video track S1 the audio portion of the clip is placed on audio track X12, provided that the track exis If a video track does not have a corresponding audio track, you cannot drag a linked c onto the video track.

You can separate linked clips permanently or temporarily. You can place linked audio a video on differently numbered tracks if you temporarily release the link. For more inf mation on editing linked clips, see "Separating and Rejoining Linked Clips" on page 9

To delete the audio or video portion of a linked clip without affecting the other component:

1 Click the portion of the clip in the Construction window that you want to delete.

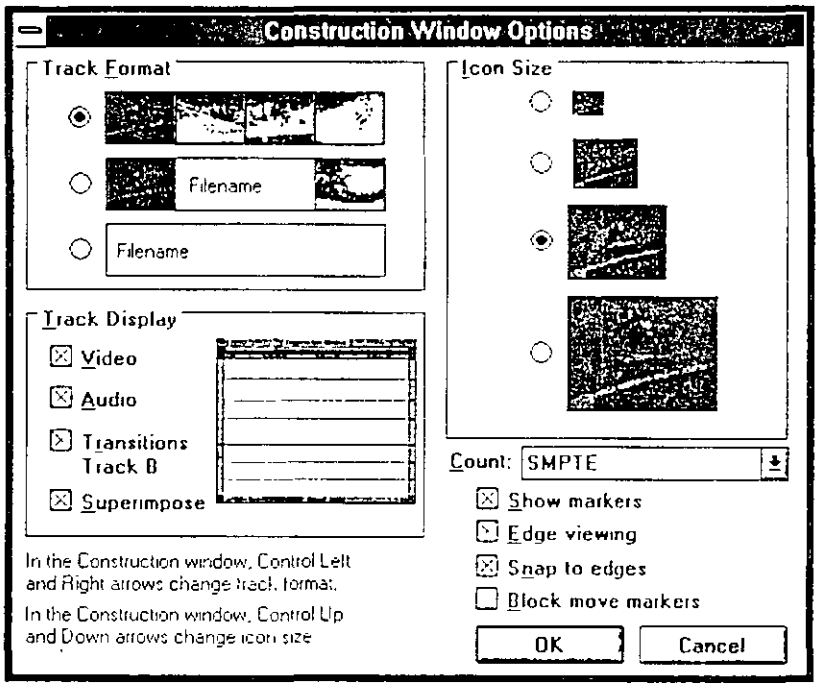
2 Press Delete, or choose Clear from the Edit menu.

Changing the Construction window display

You can display clips in the Construction window using thumbnails, filenames, or bot You can choose from four icon sizes for thumbnails. You can also specify which tracks displayed in the Construction window. For example, if you are working exclusively wi video tracks, you can choose to turn off the display of audio tracks. By default, all the tracks appear in the Construction window.

To change the Construction window display:

1 With the Construction window active, choose Construction Window Options from the Windows menu or click the right mouse button on the Construction window title bar. The Construction Window Options dialog box appears.



2 Select a track format. The Filename Only track format draws the Construction window the fastest. The middle option, showing only the first and last frames of clips, also allows relatively fast redrawing of the window.

3 To select an icon size, click the appropriate button. Use the smallest icon size when you have many tracks to view in the Construction window.

4 Select which tracks to display in the Construction window from the Track Display area.

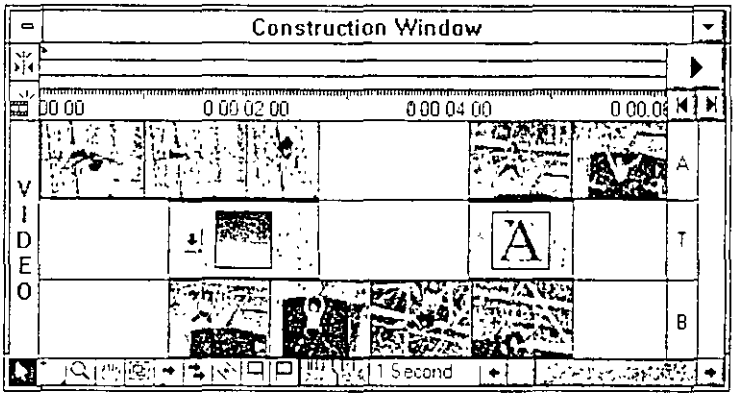
5 Choose the frame numbering format used to count frames in the Construction window from the Count drop-down list.

Changing the number of thumbnails in the Construction window

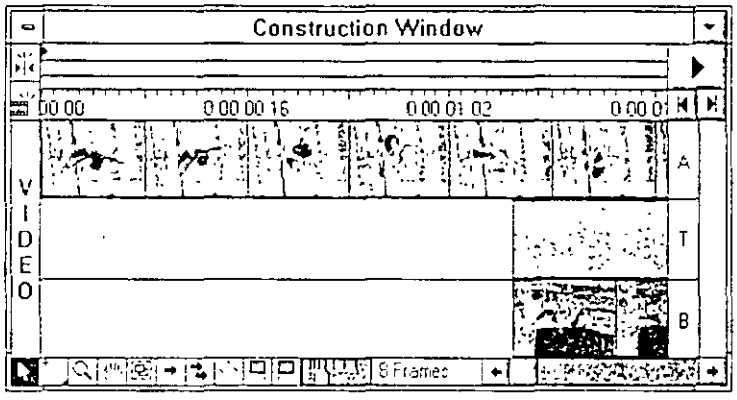
The default time unit for the Construction window is 1 second, which means that the Construction window displays one thumbnail for each second of a clip. Assigning a larger value to the time unit, such as 1 minute, displays fewer thumbnails per clip, but lets you see more of the Construction window. In general, the more detail you want to see in a clip, the smaller the time unit you should select. For more of an overview of a clip, select a larger time unit. As you become more familiar with the Adobe Premiere program, you'll have a better idea of when to use a small time unit and when to use a larger one.

To change the time unit for the Construction window:

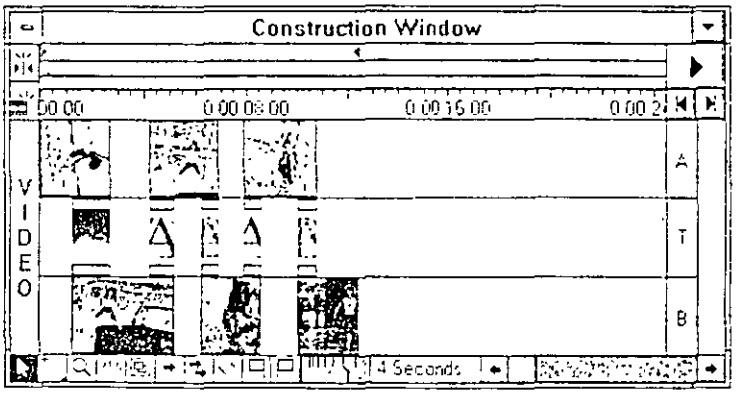
Drag the time unit selector at the bottom of the Construction window, or use the zoom tool in the tools palette. You can set the time unit from 1 frame (1/30th second for a 30 fps project) to 2 minutes. For more information on the zoom tool, see "Using Tools in the Construction Window" on page 58.



Default time unit (1 second)



Time unit in Construction window set to 8 frames



Time unit in Construction window set to 4 seconds

To view the entire project in the Construction window:

Make the Construction window active, and press the backslash (\) key. The number of thumbnails shrinks so that the entire project fits in the Construction window, and the time unit selector at the bottom of the window adjusts accordingly.

Changing the display of audio clips in the Construction window

You can display audio clips in the Construction window with waveforms or with straight bars. The straight bar approximation appears more quickly than waveforms. Reducing the time required to redraw the Construction window is especially beneficial when the time unit is small (one to eight frames).

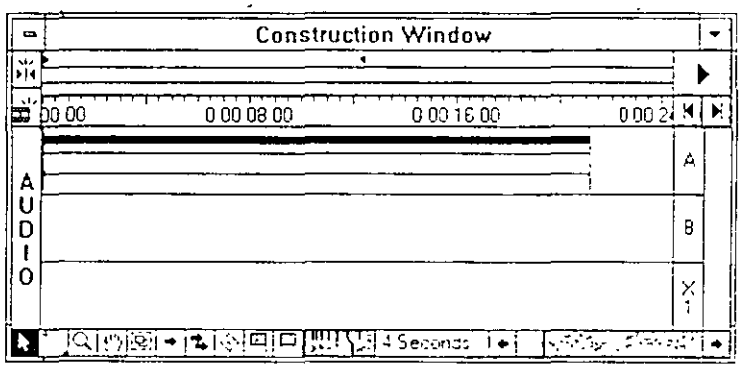
To change the audio display:

1 Choose Preferences > Audio from the File menu. The Audio Preferences dialog box appears.

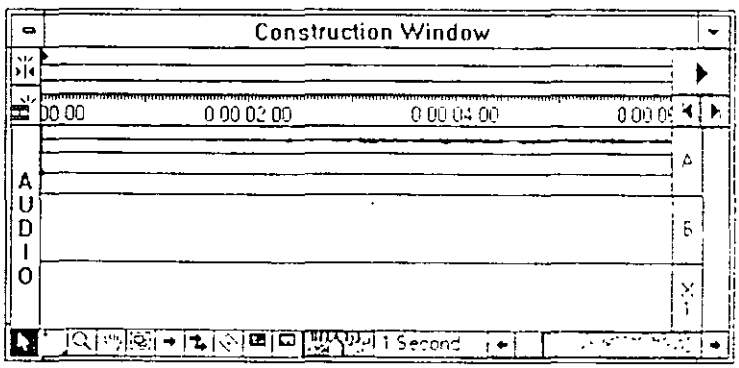
2 Choose the view in which to approximate the audio; or choose All Views or No Views.

3 Click OK.

If the time unit does not match the selected view, the audio clip appears as a straight bar. For example, if you choose Medium Views but set the time unit to 4 seconds, the audio clip appears as a straight bar. If the time unit matches the selected view, the audio clip appears as a waveform.



Audio approximation: time unit does not match selected view



Waveform display: time unit matches selected view

Disabling clips in the Construction window

Clips that have been placed in the Construction window can be *disabled* so that they won' be included when you build a preview or compile a movie. This feature is useful if you want to keep several versions of a clip available for previewing or compiling, or if you wan to disable the audio or video portion of a linked clip. It is also useful if you have many composited clips on multiple tracks, but you only want to see how two of the clips interac In this situation, the disabled clips are not visible and do not take up processing time.

You can toggle the status of a clip between enabled and disabled by selecting the clip in th Construction window and choosing Enabled from the Clip menu. A disabled clip is marked with a crosshatched line pattern. You must disable the audio and video portion of linked clips separately.

Deleting clips from the Construction window

If you decide that you don't want to use a clip in your project, you can delete it from the Construction window. Deleting a clip from the Construction window does not delete th clip from the Project window. When you delete a clip, you can leave an empty space on th track where the clip was, or you can perform a "ripple" delete, which shifts the contents o all other tracks over to close the gap left by the deleted clip.

To delete a clip from the Construction window and leave an empty space:

1 Select the clip or clips in the Construction window.

2 Press Delete, or choose Clear from the Edit menu.

To perform a ripple delete:

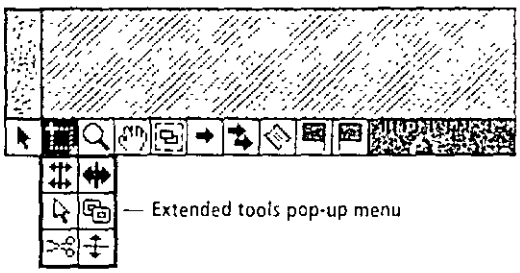
1 Select the clip or clips

2 If you do not want a clip on another track to shift over, lock the track. For informatio on locking tracks, see "Locking Tracks in the Construction Window" on page 94.

3 Choose Ripple Delete from the Edit menu, or press Ctrl+Delete.

Using tools in the Construction window

The Construction window contains a set of tools for selecting and editing the clips in your movie. Tool icons are displayed in the tools palette, located in the lower-left corner of the Construction window. The tools palette initially displays a range select tool under which resides an extended tools pop-up menu. When you choose a tool from this menu, it takes the place of the range select tool in the palette.



To select a tool, click its icon in the tools palette, or press the tool's corresponding letter on the keyboard. After a tool is selected, the pointer changes to the tool's icon when positioned over an appropriate part of the Construction window.

Construction Window Tools

Selection tool *(s from keyboard)*

This tool selects and moves clips, transitions, and markers one at a time.

It changes into a stretch pointer when positioned over the edge of a clip, allowing you to shorten or lengthen the clip by dragging. For information on using the selection tool to change a clip's duration, see "Trimming Clips in the Construction Window" in Chapter 3.

Range select tool *(e from keyboard)*

This tool drags to select multiple items in the Construction window. When multiple items are selected, many commands from the Clip and Edit menus are applied to all selected items.

Zoom tools *(z from keyboard)*

These tools perform the same function as the time unit slider at the bottom of the Construction window. The zoom-in tool decreases the time unit, the zoom-out tool (hold down the Alt key) increases the time unit.

This tool can also draw a marquee and fill the Construction window with the selected view. The time unit is adjusted accordingly. For information on how the time unit value affects the display, see "Changing the Number of Thumbnails in the Construction Window" earlier in this chaper

Stretch tool *(w from keyboard)*

This tool changes the duration of a clip and adjusts its speed to fit the new duration.

Hand tool *(h from keyboard)*

This tool scrolls the contents of the Construction window to display different areas of your movie. Scroll the window by dragging.

Block select tool *(b from keyboard)*

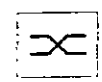
This tool selects a segment of equal length from all tracks in the Construction window. For more information, see "Splitting Clips" and "Working with Virtual Clips" in Chapter 3.

Track tool *(t from keyboard)*

This tool selects all clips on a track, from the first clip clicked to the end of the track. To add to a selection, hold down the Shift key and click.

Multitrack tool *(m from keyboard)*

This tool selects all clips in the Construction window that are placed to the right of the point you click. This includes clips that start at an earlier point on the timeline and extend beyond the point you click.



Audio fade tool *(v from keyboard)*

This tool creates an automatic audio cross dissolve between two clips. To create the cross dissolve, click the first audio clip, then click a second audio clip that overlaps the first.

Razor tool *(r from keyboard)*

This tool cuts a clip into two or more distinct clips. For more information, see "Splitting Clips" in Chapter 3.

In point tool *(i from keyboard)*

This tool sets in points for movie clips, audio clips, transitions, and the work area bar. For more information, see "Trimming Clips in the Construction Window" in Chapter 3.

To select the in point tool when the selection tool is active, hold down the Ctrl and Shift keys.

Out point tool *(o from keyboard)*

This tool sets out points for movie clips, audio clips, transitions, and the work area bar. For more information, see "Trimming Clips in the Construction Window" in Chapter 3.

To select the out point tool when the selection tool is active, hold down the Ctrl key

Ripple edit tool *(extended tools pop-up or p from keyboard)*

This tool adjusts the duration of a clip without affecting the duration of other clips on the track. For more information, see "Using the Ripple and Rolling Edit Tools in the Construction Window" in Chapter 3.

Rolling edit tool *(extended tools pop-up or y from keyboard)*

This tool adjusts the duration of a clip and its adjacent clip to maintain the original combined duration of the two clips and all subsequent clips For more information, see "Using the Ripple and Rolling Edit Tools in the Construction Window" in Chapter 3

Link override tool *(extended tools pop-up or u from keyboard)*

This tool lets you move the video or audio portion of a linked clip independently. For more information, see "Separating and Rejoining Linked Clips" in Chapter 3.

Note: Although the video or audio portion of a linked clip can be moved independently when you use the link override tool, the audio and video portions of the clip remain linked when you release the tool.

Soft link tool *(extended tools pop-up or l from keyboard)*

This tool creates a soft link between an audio clip and a video clip For more information, see "Separating and Rejoining Linked Clips" in Chapter 3

Fade scissors tool *(extended tools pop-up or k from keyboard)*

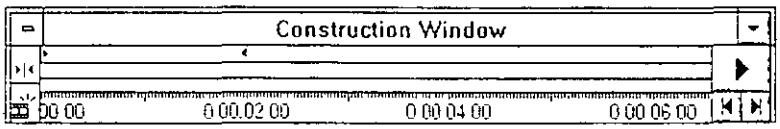
This tool creates two handles next to each other in the Fade control section of an audio or superimposed clip. With two handles, you can make adjustments that sharply increase or decrease the fading at a point For more information, see "Mixing Audio Clips" in Chapter 3 or "Adjusting the Intensity of Superimposed Clips" in Chapter 7.

Fade adjustment tool *(extended tools pop-up or g from keyboard)*

This tool uniformly adjusts a segment in the Fade control section of an audio or supermiposed clip For more information, see "Mixing Audio Clips" in Chapter 3 or "Adjusting the Intensity of Superimposed Clips" in Chapter 7.

Using the time ruler

The time ruler at the top of the Construction window reflects the selected time unit. It displays the current position of the pointer and any place markers that have been set in the Construction window. From the time ruler, you can also determine the starting and ending positions of each clip and the duration of the entire movie.

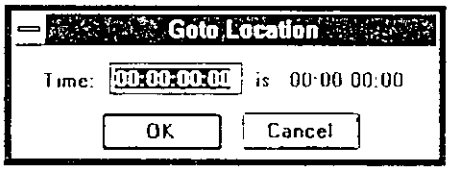


The large tick marks on the time ruler represent the current time unit; the small tick marks represent frames or seconds, depending on the current time unit. As you move the pointer in the window, a hairline marker moves in the time ruler to indicate the current pointer position.

You can scroll in the Construction window to move to a location on the time ruler, or you can use the Goto/Search command.

To use Goto/Search to move to a specific location on the time ruler:

1 Make the Construction window active, and choose Goto/Search from the Project menu. The Goto Location dialog box appears.



2 To move to a specific location, enter the time or frame number of the location using the SMPTE timecode format. For more information, see "SMPTE Timecode" on page 284.

3 Click OK.

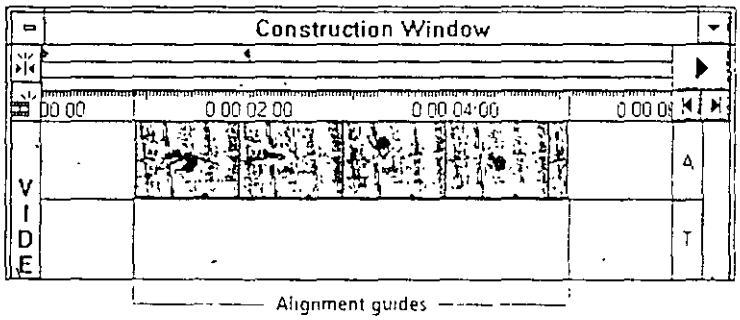
Note: You can use colons, semicolons, or periods interchangeably as separators for a time entry.

Arranging clips in the Construction window

Adobe Premiere plays all the clips in the Construction window in order from left to right The simplest arrangement for a movie is to assemble the clips end-to-end on a single video track so that the out point of one clip butts against the in point of the next clip. To create a movie with less abrupt transitions between clips, you can place the clips on the A and B video tracks so that they overlap, and use the T track for transitions. Use the S tracks for movie clips, still-image clips, or titles you want to superimpose.

You can arrange clips in the rough order in which you want them to play; then position them precisely using the Snap to Edges option, the time ruler, or the timecode displayed in the Info window. You can also use place markers to align clips. For information on place markers, see "Setting Place Markers for Clip Alignment" on page 72.

When you drag a clip to move it or to change its duration, Adobe Premiere brackets the edges of the clip with alignment guides. These guides help to align the clip with clips on other tracks. When you release the mouse button, the alignment guides disappear.

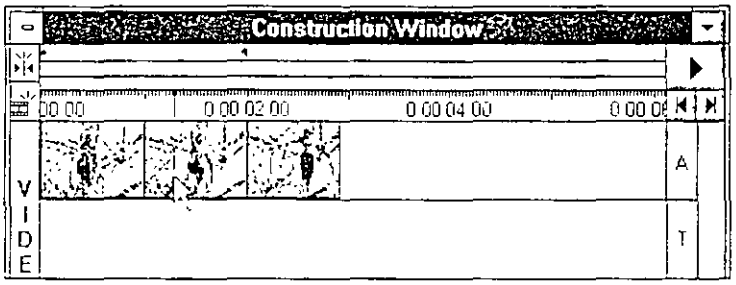


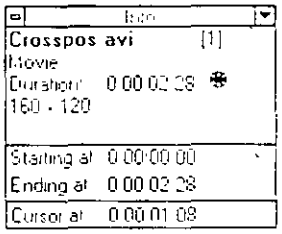
To position clips, use one of the following techniques:

- To snap a clip to the edge of another clip when you drag it, use the Snap to Edges option. This is the default setting for aligning clips in the Construction window. As you drag a clip, its alignment guides will snap to the edges of clips or transitions on other tracks. This enables precise edge alignment on all tracks.

To toggle Snap to Edges on and off, choose Construction Window Options from the Windows menu and select Snap to Edges, or click the snap tool in the upper-left corner of the Construction window.

• To make a clip start at a certain time in the movie, align the left edge of the clip with the desired time on the time ruler, or drag the clip to the desired starting point using the Info window for reference.





• To make a clip stop at a certain time, align the right edge of the clip with the ruler mark for that time. You cannot stretch movie and audio clips beyond their original length.

• To select all clips on a track at once, click the track tool and then click the first clip you want included in the selection. Drag to align the selected track of clips. To add other tracks to the selection, hold down the Shift key and click.

Note: You will not be able to align clips precisely if the time unit you have set is too large. For more information on adjusting the time unit, see "Changing the Number of Thumbnails in the Construction Window" on page 54.

• To include linked clips when selecting all clips on a track, choose the multitrack tool and then click the first linked clip you want included in the selection. All subsequent clips (linked and unlinked) are selected. To add to or subtract from a selection with the multitrack tool, hold down the Shift key and click.

Deleting empty space between clips

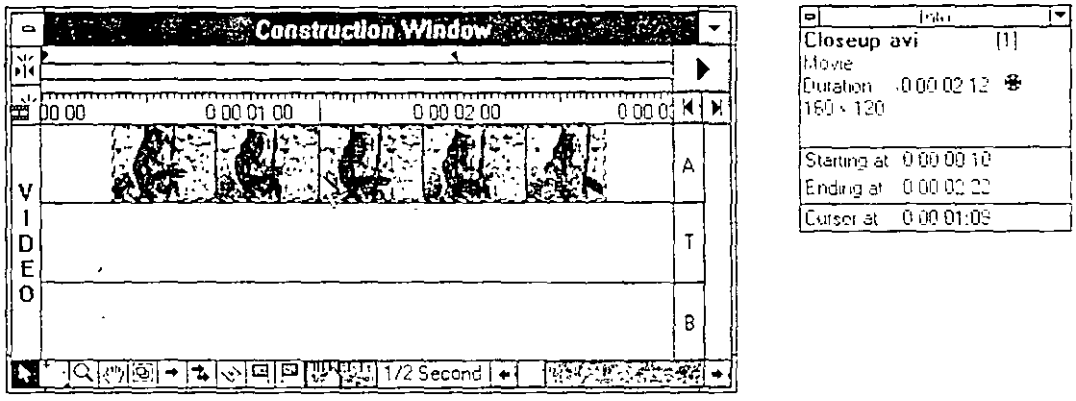
As you place clips in the Construction window, you can quickly delete empty space between clips on a track. To delete empty space between clips, select the space and choose Ripple Delete from the Edit menu, or press Ctrl+Delete. Adobe Premiere shifts over all clips and transitions on any unlocked tracks to close up the space. For information on locking tracks, see "Locking Tracks in the Construction Window" on page 94.

USING THE INFO WINDOW

The Info window displays information about a selected clip, transition, or space. The information varies according to where you make your selection:

• If you select a clip in the Construction window, the Info window displays the name of the clip, the type of clip, the speed of the clip (if a speed other than the default setting has been entered), the duration of the clip, the size of the clip, the fade control levels of selected

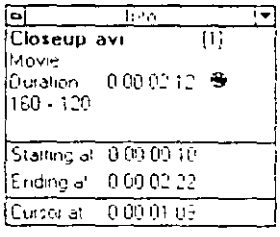
points in the clip, the starting and ending times of the clip, and the current location of the pointer. It is sometimes helpful to watch the starting and ending time in the Info window as you drag to align a clip in the Construction window.



- If you select a clip in the Project window, the Info window displays the clip's name, type, duration, size, starting and ending points, and the current location of the pointer.
- If you select a transition in the Construction window, the Info window displays the transition's name, duration, starting and ending points, and the current location of the pointer.
- If you select an empty space in the Construction window, the Info window displays the space's duration and starting and ending times.
- If a Title window is active, the Info window displays information about a selected object, including its size and position in the window.

To display the Info window:

Choose Info from the Windows menu, or press Ctrl+8.



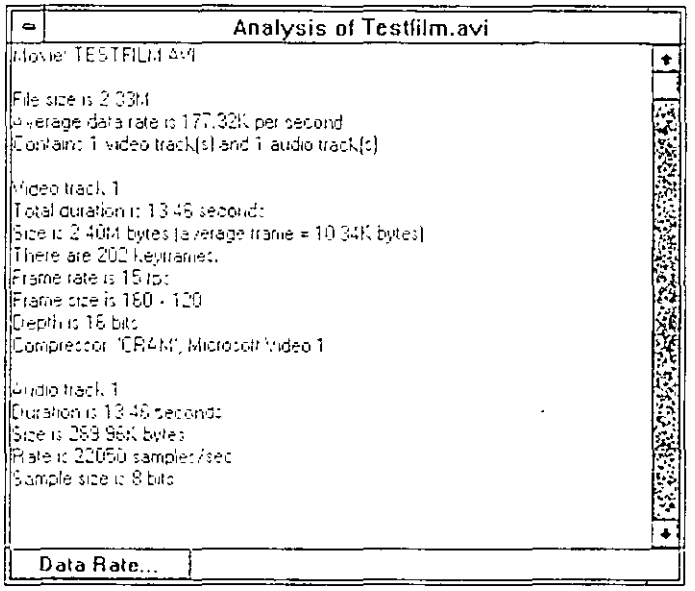
USING THE MOVIE ANALYSIS TOOL

The Movie Analysis feature provides detailed information about any Video for Windows movie, including the file size, number of video and audio tracks, duration, average frame rate, audio rate, and compression settings.

To analyze a movie:

1 Choose Tools > Movie Analysis from the File menu.

2 Use the standard Open File dialog box to locate the Video for Windows movie. The Analysis window displays information about the movie.



Note: You can analyze the clip in the active Clip window by choosing Movie Analysis from the Clip window's Control menu. Information about the current clip appears in the Analysis window.

3 To display a graph of the clip's data rate over time, click the Data Rate button in the Analysis window. The Data Rate graph shows you how smoothly the video clip will play.

4 To print the contents of the Analysis window, choose Print Window from the File menu. To print the Data Rate graph, click the Print button in the Data Rate Graph window.

USING FUNCTION KEYS

Adobe Premiere lets you assign frequently used commands to function keys. Some function keys are preassigned in Adobe Premiere. You can add additional assignments or change the existing ones. You can save your function key assignments and load them whenever you start up Adobe Premiere.

To change the function key assignments:

1 Choose Preferences > Function Keys from the File menu. The Function Keys dialog appears.

2 To remove a function key assignment, select the command name next to the function key name and press the Delete key.

3 To add a function key assignment, click the text box next to the function key name and choose the command that you want to assign to that function key from the menu bar. The command appears in the text box.

4 To assign commands to a function key plus the Shift key, select the Shift option and choose the menu command you want to assign to the function key.

Using the Shift key allows you to assign a second command to the function key. To choose the command on the keyboard, press the Shift key and the function key. For example, you could assign the Import > Directory command to the F7 key and the Import > Project command to Shift+F7.

5 To save your assignments, click Save and specify a filename.

6 To load an existing file of assignments, click Load and select the file. Function key assignment files have a *.pfl* file extension.

Note: *You cannot change the assignment of F1 and Shift+F1; these keys display the Adobe Premiere Help system.*

PRINTING THE CONTENTS OF WINDOWS

You can print the contents of the Project window, the Construction window, or a movie clip in the Clip window. Printed windows can be useful as a storyboard of your project.

To print a paper copy of a window:

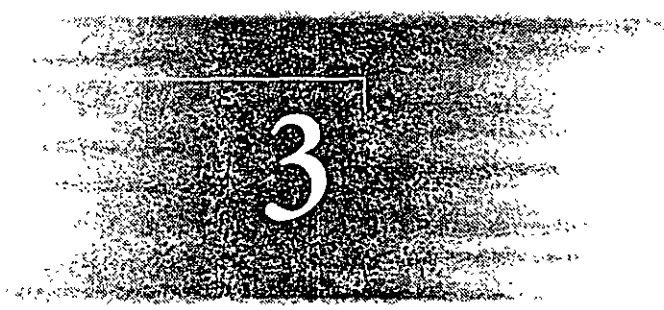
1 Click the Project, Construction, or Clip window to make it active.

2 Choose Print Window from the File menu. The Print dialog box appears.

3 Click Setup in the Print dialog to change the printer settings. You can also change the printer settings by choosing Print Setup from the File menu.

4 Click OK.

Chapter



Chapter 3: Editing

This chapter describes the basic techniques used to edit clips and construct a movie in Adobe Premiere. This chapter also describes how to generate an Edit Decision List (EDL) from the Construction window for online editing of source videotape in a post-production studio.

Until recent years, video editing was strictly *linear*; the entire program of video, audio, and special effects segments had to be identified and sequenced in exact order before the final videotape was made. The editing process in Adobe Premiere is *nonlinear*; you can insert, copy, replace, transform, and delete clips at any time. You can experiment with various sequences and effects, previewing the changes before compiling your final movie or outputting to videotape.

The following editing operations are presented in this chapter:

- Viewing a clip
- Setting markers in a clip for precise alignment with other clips and effects in the Construction window
- Trimming a clip (changing its starting and ending frames)
- Setting the duration of a still-image clip
- Splitting a clip into two new clips
- Insert editing
- Changing the speed of a clip to achieve motion effects
- Mixing audio clips (similar to mixing audio tracks in a sound studio)
- Modifying clips in other applications (such as Adobe Photoshop)
- Generating an EDL

Note: *More advanced editing techniques involve applying transitions between clips, superimposing clips, and adding motion and special effects to clips. These procedures are presented in subsequent chapters.*

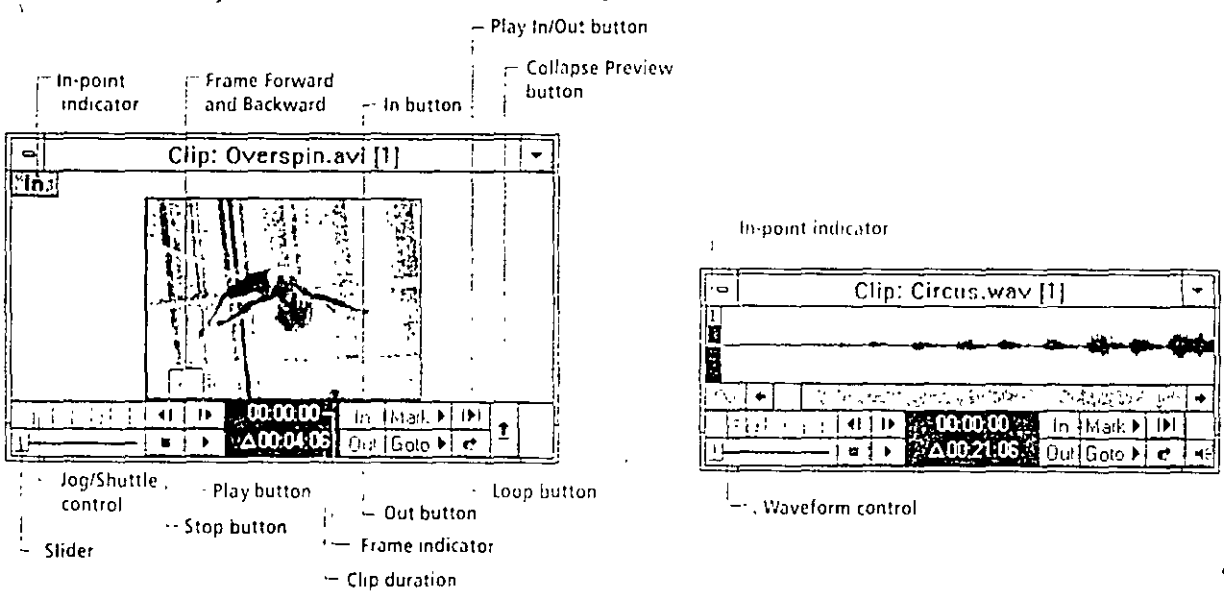
You edit clips in Adobe Premiere using the Clip window, the Construction window, and the Trimming window. The Clip window is used mainly for viewing clips, setting in points and out points in clips, and setting markers in clips. The Construction window is used primarily for arranging clips, splitting clips, inserting clips, layering and compositing clips, and mixing audio clips. It can also be used to trim clips and to change the speed of clips. The Trimming window is used to precisely adjust the edit point between two clips in the Construction window and instantly see the effect of the adjustment.

Note: A special type of window, called the Controller, is used for previewing an area in the Construction window. While previewing with the Controller, you can set markers and make cuts across tracks in the Construction window. For information on the Controller, see "Using the Controller" on page 120.

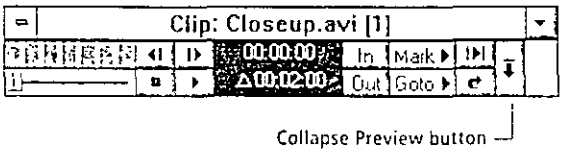
USING THE CLIP WINDOW

By default, Adobe Premiere plays a movie or an audio clip in the Clip window from beginning to end, as it was originally recorded. You can use the Clip window to change the starting and ending frames of a clip, to change the duration of a still-image clip, and to set markers in a clip for aligning with other clips, and for quick navigation.

The Clip window controls are similar for video and audio clips. The frame indicator displays the current position in the clip. For still images, the Clip window contains a duration control.



You can collapse the Clip window and use the Clip window controls to view a video clip in the Preview window. This is useful when you have several Clip windows open on-screen. You collapse or expand the video clip using the Collapse Preview button.



Opening a clip in a Clip window

In most cases, each time you open a clip, a new Clip window opens. Consequently, you can have any number of Clip windows open at the same time. The Clip window initially displays the first frame of a movie clip or the waveforms of an audio clip. To reduce the screen clutter that can occur if too many windows are open at once, you can optionally open a clip in an existing Clip window.

To open a clip in a new Clip window, use one of the following methods:

- Double-click the clip's thumbnail in the Project window or in the Construction window.

Note: *To open only the audio portion of a linked clip, double-click the audio waveform portion of the thumbnail in the Project window.*

- Select the clip in the Project window or in the Construction window, and choose Open Clip from the Clip menu.
- Choose Open from the File menu, and use the Open dialog box to select the clip.

To open a clip in an existing Clip window:

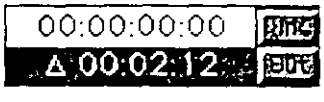
Drag the clip's thumbnail from the Project window to the Clip window. The original clip in the Clip window closes and is replaced by the new one. If the Clip window is collapsed, drag the thumbnail over the window's timecode area to display the clip in the Preview window.

Viewing and playing clips in the Clip window

The Clip window controls for viewing video clips and playing audio clips are almost identical. Although audio data is stored as a continuous data stream rather than as individual frames, audio clips are synchronized to the frame rate of the movie. This allows Adobe Premiere to refer to sections of the audio waveform as frames in the same way that it refers to the image frames of a video clip.

To view or play clips in the Clip window, use one of the following methods:

- To begin playing the clip, click the Play button. To stop playing the clip, click the Stop button. You can also press the spacebar to start and stop playing a clip.
- To play the clip in reverse, hold down the Alt key as you click the Play button.
- To play the clip between the in and out points, click the Play In/Out button. To play the clip continuously (loop) between the in and out points, press the Loop button or hold down the Ctrl key as you press the spacebar.
- To go forward or backward one frame at a time, click the Frame Forward or Frame Backward button, or press the Right Arrow or Left Arrow key. To go forward or backward five frames at a time, hold down the Shift key while pressing the Right or Left Arrow key.
- To scrub forward or backward through portions of the clip, hold the mouse button down on the Frame buttons, or hold down the Right or Left Arrow key.
- To fast-forward, press the F key. To rewind, press the R key (movie clips only).
- To move forward or backward through frames or to jump to another part of the clip, drag the slider.
- To scrub through the clip frame by frame, click at a point in the Jog control and drag left or right. You can continue to drag outside the control area if you don't release the mouse.
- To play the clip forward or backward at a variable speed, Alt+click the Jog control to change it to the Shuttle control. Drag the Shuttle control to the right or left; the farther you drag the Shuttle control from the center, the faster the clip plays. When you release the mouse button, the clip stops playing, and the Shuttle control moves back to the center position. (The mode of this control can also be set in the General Preferences dialog box or by choosing Clip Window Options from the Windows menu.)
- To move forward or backward by a specific duration, press the Tab key or click the current frame indicator to select it; then enter the duration using the SMPTE timecode format, and press Return.



For example, enter +5:03 to move forward five seconds and three frames. Enter –1:23 to move backward 1 second and 23 frames.

- To change the volume of the linked audio in a video clip, click the speaker icon in the lower-right corner of the Clip window. The three settings are full volume, half volume, and off.

To move to a specific frame, use one of the following methods:

- To move to a specific frame, press the Tab key or click the current frame indicator to select it; then enter the exact frame you want to move to (using the SMPTE timecode format), and press Return. For example, if you enter 0:00:43:05, the clip advances to the frame 43 seconds and 5 frames into the clip.
- To move to the beginning of the clip, press the Home key. Press the End key to move to the end of the clip.
- To change the frame numbering format used to count frames in the Clip window, choose Clip Window Options in the Windows menu and select a format from the Count drop-down list.

Resizing the Clip window

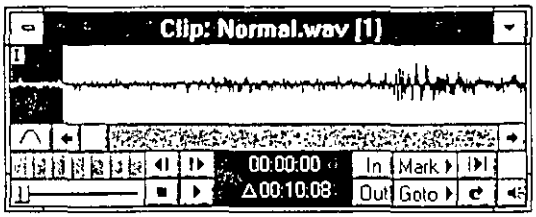
You can resize the Clip window by dragging any corner of the window. When you resize a video clip, the clip's display snaps to one of several default sizes. To scale the display to match the size of the Clip window, hold down the Shift key as you drag. To double the display size, Shift+click the clip.

Viewing the audio waveform in the Clip window

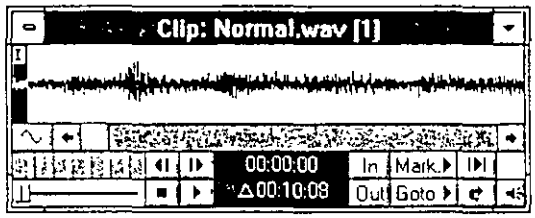
You can choose one of four different views to display the audio waveform in the audio Clip window: expanded, normal, condensed, and extra condensed. The expanded view shows the most detail, while the condensed views provide a longer duration of sound in the window. You can also enlarge the audio Clip window to make it easier to find points and set markers, especially when you are working with the expanded view of an audio waveform.

To expand or condense the audio waveform in a Clip window:

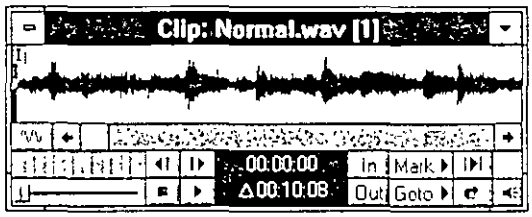
Click the Waveform control located above the Jog or Shuttle control to toggle between expanded, normal, condensed, and extra condensed.



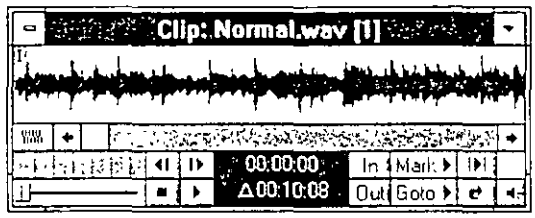
Expanded



Normal



Condensed



Extra condensed

Note: *For trimming audio clips, the audio waveform can be expanded to show increments as small as 1/600th second. For information on trimming, see "Trimming Clips" on page 76.*

To see more detail in the low amplitude portions of the waveform:

1 Make the Clip window active, and choose Clip Window Options from the Windows menu.

2 Use the Clip Window Options dialog box to set the Waveform Display option to Boosted.

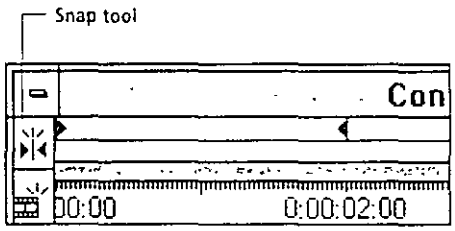
SETTING PLACE MARKERS FOR CLIP ALIGNMENT

Place markers let you mark points in the time ruler and in clips that can be used for alignment with other clips and transitions in the Construction window. For example, you may want an audio clip to begin fading in at a particular frame in a video clip. By setting place markers in both clips, you can drag one marker to another for precise alignment.

Markers work in conjunction with the Snap to Edges option in the Construction window Options dialog box. When Snap to Edges is selected, a clip in the Construction window snaps to a marker in the time ruler when it moves within a limited range of the marker. Similarly, markers in clips located on different tracks snap to each other when brought within a limited range.

Using the Snap to Edges option

The Snap tool in the upper-left corner of the Construction window indicates whether the Snap to Edges option is selected.



If you do not want markers to snap directly to the center of each other, deselect the Snap to Edges option in the Construction Window Options dialog box. To toggle the option, click the snap tool; or with the Construction window active, press the Tab key.

Setting place markers in the time ruler

You can set up to 10 place markers in the time ruler to indicate where clips should begin or end. You can set markers while previewing a movie or by selecting a point on the time ruler.

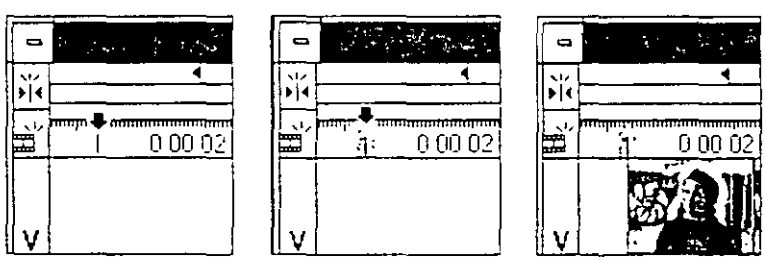
To set a place marker in the time ruler:

1 Make sure that a clip is not selected; otherwise, the marker will be placed in the selected clip.

2 Position the hairline in the time ruler at the desired point. (You do not have to drag the mouse; simply move the mouse until the hairline in the time ruler is positioned at the desired time.)

3 Hold down the Shift key and press a number from 0 to 9. A numbered green marker appears in the time ruler.

4 Drag a clip to the marker to position it at the desired starting or ending time. If the Snap to Edges option is selected, the left or right edge of the clip will snap to the marker.



To set a marker in the time ruler from a Controller window:

1 Choose Controller from the Windows menu. The Controller and Preview windows appear.

2 Use the Controller window controls to locate the movie frame you want to mark. These controls function the same as those in a Clip window. For more information on the Clip window controls, see "Using the Clip Window" on page 68.

3 Choose a number from the Mark pop-up menu. A numbered marker for the displayed frame is set in the time ruler.

4 To set a marker while the preview plays, hold down the Shift key and press a number from 0 to 9. The marker is set in the time ruler.

To delete a place marker in the time ruler:

1 Position the hairline in the time ruler over the marker you want to delete.

2 Press C. The marker is deleted. Remaining marker numbers are not reordered.

Setting place markers in clips

You can set up to 1000 place markers in a clip, but only 10 can be numbered. You can accurately position markers in an audio clip while the sound is playing, simplifying the task of synchronizing audio tracks with video tracks.

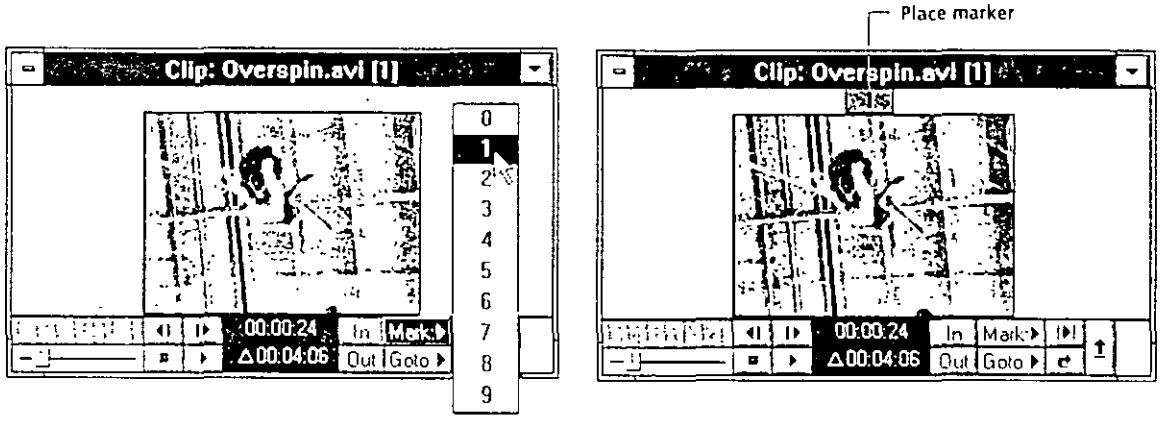
Numbered and unnumbered clip markers appear as blue tags in the Construction window thumbnails. You can toggle the display of markers on and off with the Show Markers option in the Construction Window Options dialog box.

To set a place marker in a movie or audio clip:

1 In the Clip window, find the frame of the clip or the area of the waveform you want to mark using any of the methods described in "Viewing and Playing Clips in the Clip Window," on page 69.

2 To set a numbered marker, select a marker number from the Mark pop-up menu.

Adobe Premiere places a bullet next to the number in the Mark pop-up menu to indicate that the marker is in use, and places the marker with the selected number in the frame or waveform.



3 To set a numbered place marker while a movie or audio clip is playing, hold down the Shift key and press the desired number on the keyboard.

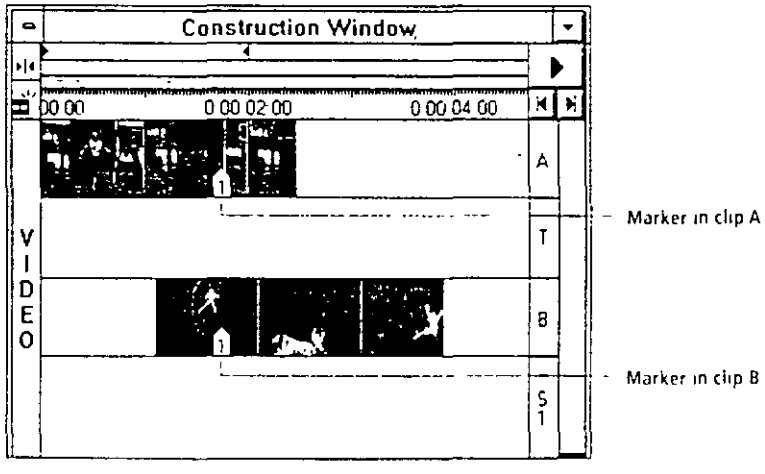
4 To set an unnumbered marker, press the equal sign (=) key or plus (+) key. You can set unnumbered markers while a movie or audio clip is playing.

To align place markers in the Construction window:

1 Make sure that the Show Markers option is on by choosing Construction Window Options from the Windows menu.

2 Position the selection tool on the marker you want to align with another marker. The selection tool turns gray.

3 Begin dragging the marker. As you drag, an alignment guide appears through the center of the marker to help you align the markers. If the Snap to Edges option is turned on, the markers snap to each other.



4 When the markers are precisely aligned, release the mouse button.

To delete a place marker from a movie clip:

In the Clip window, position the pointer over the frame containing the marker and press C or X on the keyboard. Remaining marker numbers are not reordered.

To delete a place marker from an audio clip:

In the Clip window, select the marker in the waveform and press C or X on the keyboard. Remaining marker numbers are not reordered.

Finding place markers in clips

You can use the Clip window to find frames that have been marked in a clip.

To find a marker, use one of the following methods:

- Click Goto and select a numbered place marker from the pop-up menu. Bullets indicate which markers are in use in the clip.
- Press a number from 0 to 9 on the keyboard to go to a marker.
- Move to the next marker or previous marker by holding down Ctrl and using the Right or Left Arrow keys.

TRIMMING CLIPS

Trimming refers to adding or subtracting frames to change a clip's duration. The position of a clip's starting frame is called the *in point* (sometimes referred to as the *head*), and the position of the ending frame is called the *out point* (sometimes referred to as the *tail*). Clips can be trimmed in the Clip window, the Construction window, or the Trimming window. Of these three, the Trimming window offers the most precise control and instant feedback.

Changes you make to the in or out point of a clip affect the way that Adobe Premiere uses the source clip when building a movie, not the source clip itself on your hard disk.

You cannot make a movie or audio clip longer than the source clip unless you use the Speed command to slow down the clip and extend its duration. The shortest duration for any clip is 1 frame. The longest duration for any clip is 1 hour. For more information on clip duration and speed, see "Setting the Duration of a Clip" on page 86 and "Setting the Forward or Backward Speed of Clips" on page 95.

Trimming clips in the Clip window

A clip opens in the Clip window at the frame corresponding to the current in point. The duration counter shows the duration of the clip from the current in point to the current out point.

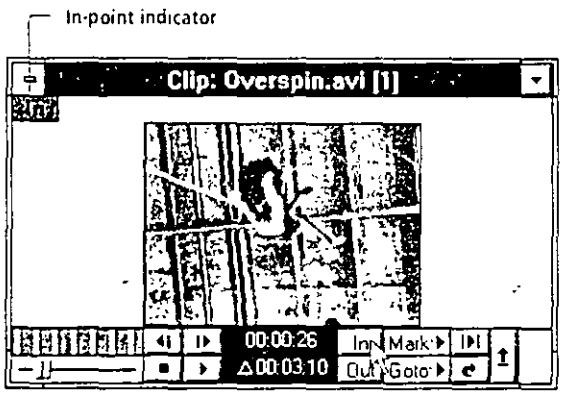
Note: You can use the Clip window to set in and out points for a clip before importing it into a project. This is useful for importing various sections of a single clip as separate clips. For information on importing clips, see "Importing and Opening Clips" on page 33.

To change the in and out points in the Clip window:

1 Find the place where you want to set the in point for the clip using one of the methods described in the section, "Viewing and Playing Clips in the Clip Window," on page 69.

2 Click the In button or press Shift+I to set the in point.

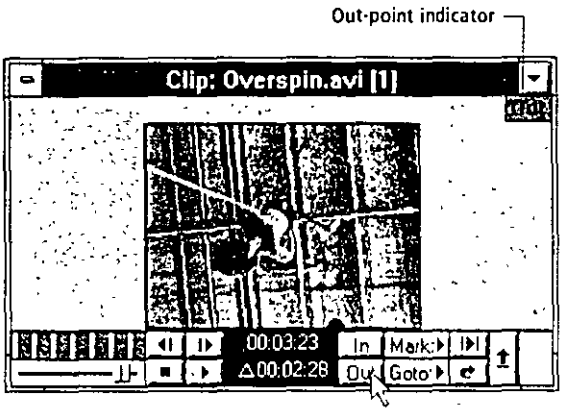
For movie clips, the in-point indicator appears in the upper-left corner of the Clip window. For audio clips, the in-point indicator appears at the corresponding point along the waveform.



3 Find the place where you want to set the out point for the clip, and click the Out button or press Shift+O.

For movie clips, Adobe Premiere places the out-point indicator in the upper-right corner of the window. For audio clips, the out-point indicator is placed at the corresponding point along the waveform. The duration counter at the bottom of the window shows the new duration of the clip.

For movie clips, Adobe Premiere places the out-point indicator in the upper-right corner of the window. For audio clips, the out-point indicator is placed at the corresponding point along the waveform. The duration counter at the bottom of the window shows the new duration of the clip.



Note: *Changing the in and out points of a movie clip that is linked to an audio clip will affect both the movie and audio portions of the linked clip.*

Setting precise in points for audio clips

You can position the in point for an audio clip with a high degree of precision when sound synchronization is critical. The in points of audio clips can be adjusted in increments as small as 1/600th of a second. Because Adobe Premiere synchronizes audio clips to the frame rate of the movie, you refer to a section of an audio waveform as a frame.

To set a precise in point for an audio clip:

1 Zoom in on the audio waveform display by choosing Clip Window Options from the Windows menu and choosing a new value for Rate. You can set the rate as small as 600 fps. (Rates of 100 and 600 fps are intended for setting the in point only; the audio may not play smoothly at these settings.)

2 Use the Frame Forward or Frame Backward button, or press the Right Arrow or Left Arrow key to go forward or backward one frame at a time.

3 Click the In button or press Shift+I to set the in point.

4 When you have finished setting the in point, choose Clip Window Options from the Windows menu and reset the rate to its original setting of 30 fps.

Finding the in and out points of a clip

The Clip window can be used to locate the in and out points of a clip. This is done in the same manner as finding place markers in a clip.

To find the in and out points, use one of the following methods:

- Click Goto and choose In or Out from the pop-up menu.
- Press I on the keyboard to go to the in point, or press O to go to the out point.

Trimming clips in the Construction window

Adobe Premiere provides a number of ways to trim clips in the Construction window. You can use the in point and out point tools or the ripple edit and rolling edit tools, or you can simply drag the edges of the clip. Using the ripple edit and rolling edit tools is described in the next section, "Using the Ripple Edit and Rolling Edit Tools in the Construction Window."

For better trimming precision, choose a low time unit in the Construction window. You can also use edge viewing (described in this section) to view the frames in the Preview window as you drag the edges of the clip.

When you change the duration of a clip in the Construction window, the Info, Project, and Clip windows are automatically updated with the new clip duration.

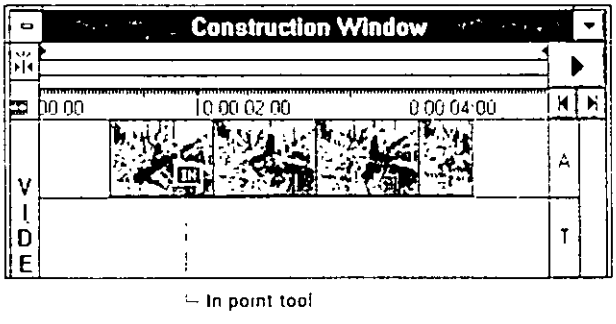
To trim a clip using the in point and out point tools:

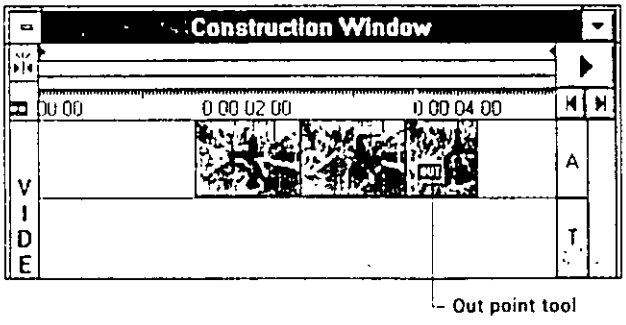
1 Select the in point or out point tool in the Construction window by clicking the tool icon or pressing I or O on the keyboard.

Note: If you click the in point or out point tool once, the tool reverts to the selection tool after one use. Double-click the in point or out point tool to use it repeatedly.

2 Click the in point tool on the left edge of the first frame you want displayed in the movie.

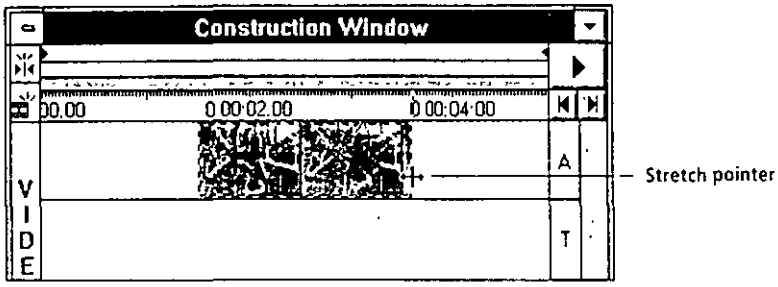
3 Click the out point tool on the right edge of the last frame you want displayed in the movie.





To trim a clip by dragging:

1 Position the selection tool on the edge of the clip to be shortened or lengthened. The selection tool turns into a stretch pointer.



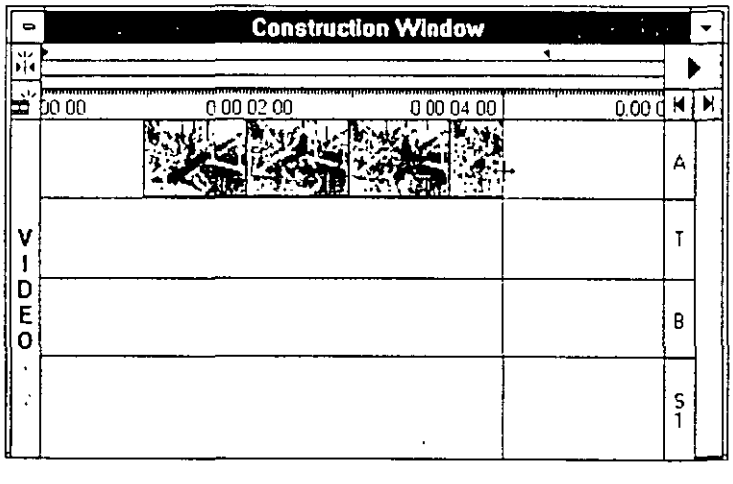
2 Drag to shorten or lengthen the clip, and release the mouse button when the clip reaches the desired length.

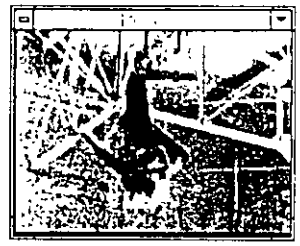
To trim a clip using the Edge Viewing option:

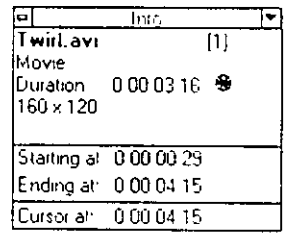
1 Make sure that the Info and Preview windows are visible on the desktop.

2 Turn on edge viewing by clicking the edge viewing tool in the upper-left corner of the Construction window. You can also use the Construction Window Options dialog box to select the Edge Viewing option.

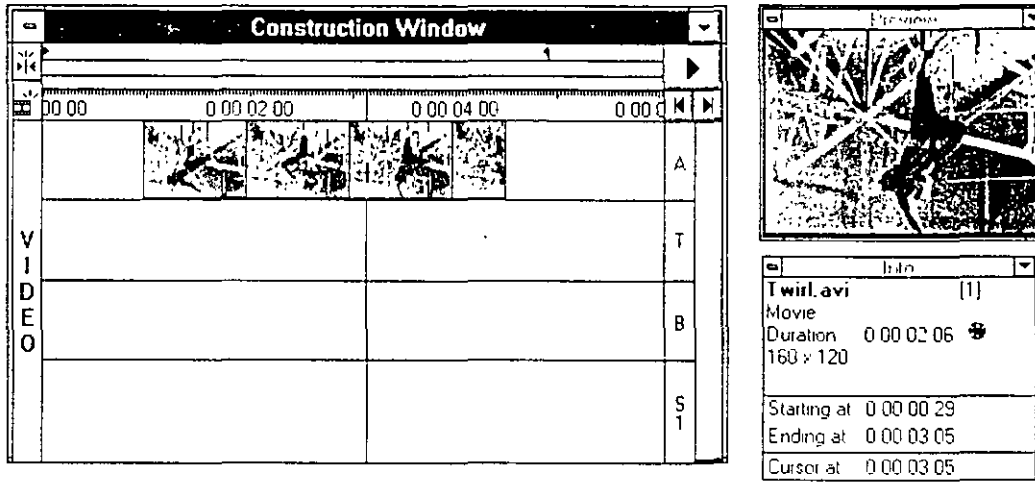
3 In the Construction window, position the selection tool on the edge of the clip to be shortened or lengthened. The selection tool turns into a stretch pointer.







4 Begin dragging the edge of the clip. As you drag, the frame corresponding to the clip's adjusted in point or out point is displayed in the Preview window, and the timecode addresses for the clip's starting and ending points are displayed in the Info window.



5 Release the mouse button when you reach the desired in or out point in the clip.

Using the ripple edit and rolling edit tools in the Construction window

The ripple edit tool adjusts the duration of one clip on a track while retaining the duration of all other clips on the track. All clips and transitions on other unlocked tracks that are placed to the right of the adjustment point are moved along the timeline to match the clip movement on the rippled track. (For information on locking tracks, see "Locking Tracks in the Construction Window" on page 94.) The effect of the duration change in one clip adjusts (ripples) the positions of other clips and may change the total duration of the movie. Ripple editing is sometimes called *film-style* editing.

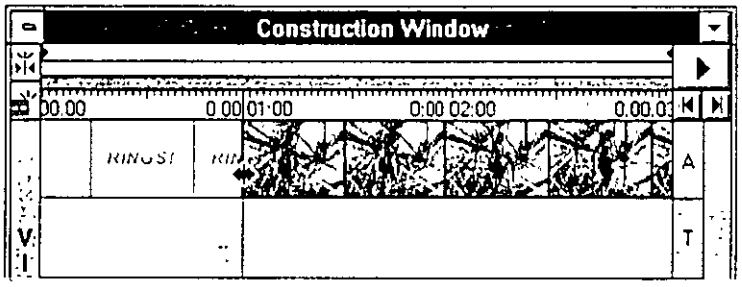
The rolling edit tool adjusts the duration of one clip, but increases or decreases the duration of the adjacent clip to maintain the original duration of the two-clip sequence and of the entire track. Rolling editing is sometimes called *video-style* editing. When performing a rolling edit, you can use Edge Viewing to see the edges of the clip and the adjacent clip in the Preview window. For information on setting up Edge Viewing, see "Trimming Clips in the Construction Window" on page 79.

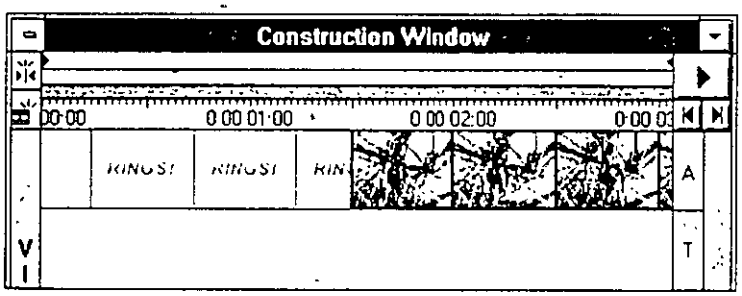
To trim a clip using the ripple edit tool:

1 Select the ripple edit tool from the extended tools pop-up menu in the lower-left corner of the Construction window.

You can also access the ripple edit tool by pressing P on the keyboard.

2 Position the mouse pointer on the joint between two clips, and drag to adjust the duration of the desired clip. The clip's duration is adjusted without affecting the durations of the other clips.



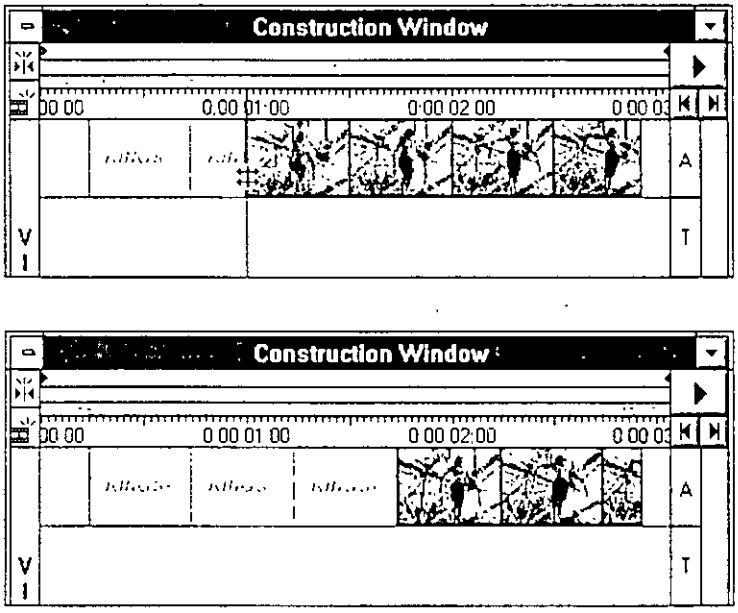


To trim a clip using the rolling edit tool:

1 Select the rolling edit tool from the extended tools pop-up menu in the lower-left corner of the Construction window.

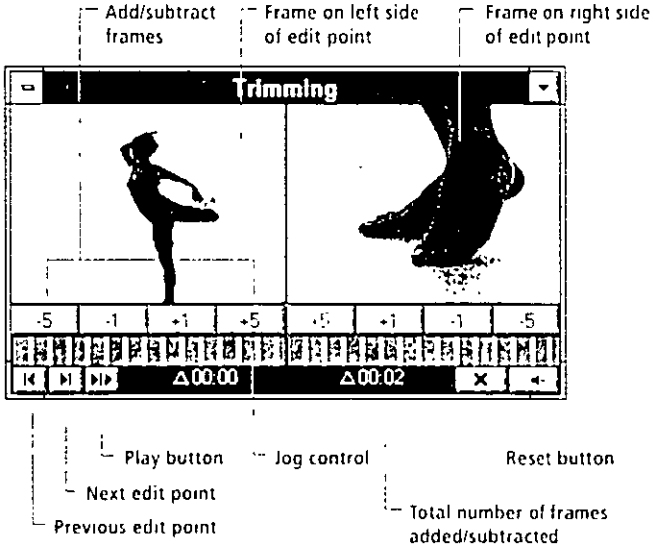
You can also access the rolling edit tool by pressing Y on the keyboard.

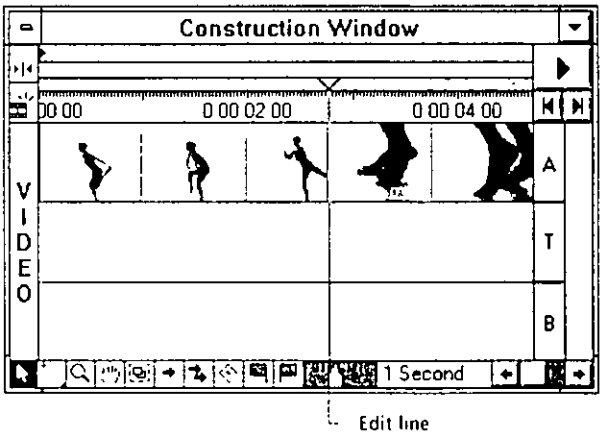
2 Position the mouse pointer on the joint between two clips, and drag to trim the clip. One clip's duration is adjusted, and the other clip's duration is shortened or lengthened to offset the adjustment.



Trimming clips in the Trimming window

If you want to be as precise as possible when trimming clips, use the Trimming window. The Trimming window lets you add or subtract frames from clips at edit points along the timeline. While making adjustments, you can see the exact frame that appears on each side of the edit point.





When trimming a clip this way, the durations of all other clips on the track remain the same, as if you were performing a ripple edit. All clips on other unlocked tracks that are placed to the right of the edit point are moved along the timeline to match the clip movement on the rippled track. (For information on locking tracks, see "Locking Tracks in the Construction Window" on page 94.) You have the option, however, of using the rolling edit tool in the Trimming window. The rolling edit tool adjusts the duration of one clip, and increases or decreases the duration of the adjacent clip. Doing so maintains the original duration of the two-clip sequence and of the entire track.

While working in the Trimming window, you can return the edit point to its original location by clicking the Reset button.

You can change the display of the Trimming window in a variety of ways. The window can display up to five frames on either side of the edit point. You can also set the number of frames to manipulate with the add/subtract buttons, and how many seconds to preview around the edit point.

To perform a ripple edit in the Trimming window:

1 Choose Trimming from the Windows menu. The Trimming window appears.

2 Click the Next or Previous button to move the edit line to the point you want to adjust. The frames on both sides of the edit point are displayed in the Trimming window. If you position the edit line on a transition, the last frame of the clip on track A and the first frame of the clip on track B are displayed.

3 To add or subtract a specific number of frames from the clip on the left side of the edit point, click either the + or – button on the left side of the window. To add or subtract frames from the clip on the right side of the edit point, click either the + or – button on the right side of the window.

4 To add or subtract a larger number of frames, drag the Jog control on either side of the window. The edit line moves in the direction and distance you drag.

Alternately, you can add or subtract frames by clicking one of the time displays and typing a new time value.

5 To preview the new edit, click the Play button.

To perform a rolling edit in the Trimming window:

1 Choose Trimming from the Windows menu. The Trimming window appears.

2 Move the mouse pointer to the joint between the two frames displayed in the window. The pointer changes to the rolling edit tool.

3 Drag to the left or right to trim the clips. As one clip's duration is trimmed, the other clip's duration is lengthened.

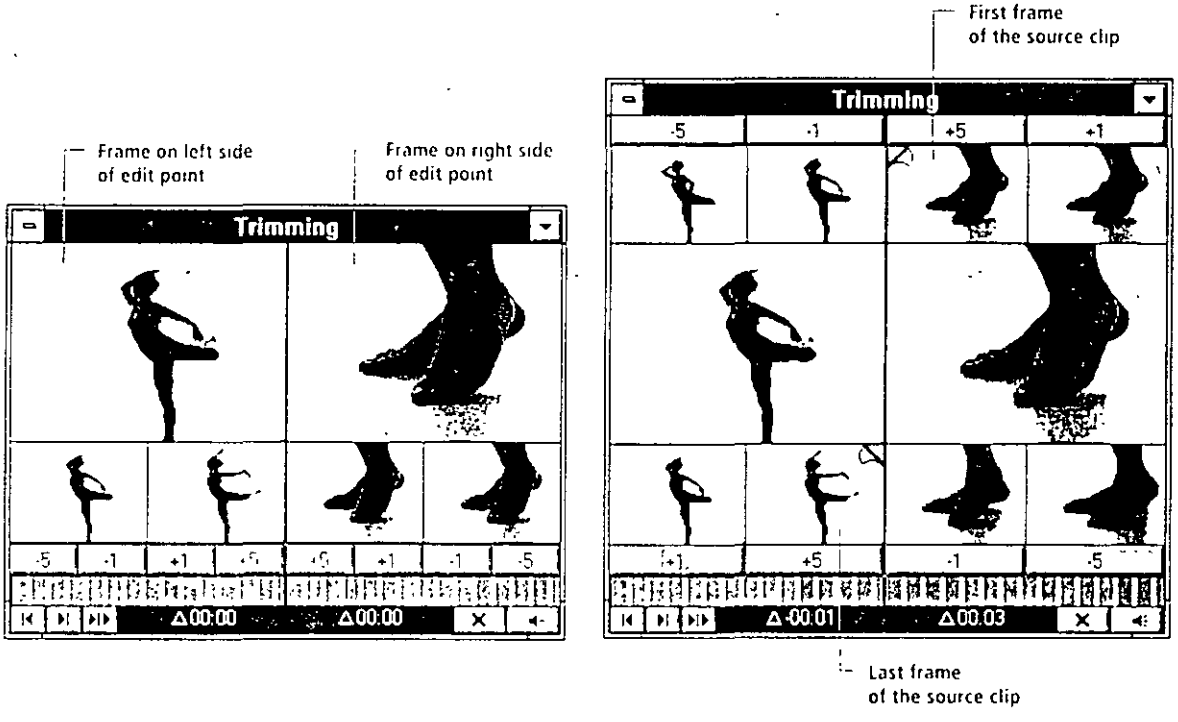
4 To preview the new edit, click the Play button.

To change the Trimming window settings:

1 Make the Project Trimming window active.

2 Choose Trimming Window Options from the Windows menu, or click the right mouse button on the window title bar. The Trimming Window Options dialog box appears.

3 Select a format for displaying the frames on both sides of the edit point. You can display the single frame on each side of the edit point, the three frames surrounding the edit point on each side, or the five frames surrounding the edit point on each side.



4 Specify the large-frame offset (how many frames to move the edit point with the larger numbered plus and minus buttons). The default number is 5 frames.

5 Specify how many seconds (centered around the edit point) of the clip should play when you preview the new edit point.

6 To play previews at the maximum size available in the Trimming window (or in the Preview window if you collapse the Trimming window), select Play Preview at Maximum Size.

7 Click OK.

Setting the duration of a clip

You can set the duration of any movie clip, still-image clip, or transition while the Clip window is active or while the clip is selected in the Project, Construction, or Sequence window.

A new duration setting changes the out point of a clip. Time-based clips (movies and audio) cannot be lengthened beyond the duration of the original clip unless a slower speed is assigned to the clip using the Speed command in the Clip menu. For more information on the Speed command, see "Setting the Forward or Backward Speed of Clips" on page 95.

The default duration of still-image clips is 1 second. You can change this default duration by using the Preferences option in the File menu.

To set the duration for a clip:

1 Select the clip in the Project, Construction, or Sequence window, or open the clip using one of the methods described in "Using the Clip Window" on page 68.

2 Choose Duration from the Clip menu. If you are setting the duration of a still-image clip, you can also click the Duration button in the still-image Clip window. The Clip Duration dialog box appears.

3 Enter a duration for the clip using SMPTE timecode (Hours:Minutes:Seconds:Frames), and click OK. If you selected multiple clips, the Clip Duration dialog box reappears for each clip.

To set a default duration for still-image clips:

1 Choose Preferences > Still Image from the File menu. The Still Image dialog box appears.

2 Enter a default duration for all still-image clips, and click OK.

PASTING CLIPS OR CLIP ATTRIBUTES IN THE CONSTRUCTION WINDOW

Adobe Premiere provides the standard Windows editing commands for cutting, copying, and pasting clips. The program also contains two additional pasting commands: Paste to Fit and Paste Custom.

The Paste to Fit command pastes a copied or cut clip or transition into a selected area of the Construction window, and changes the duration (sets a new out point) of the clip to fit it into the selected area. This feature is especially useful for replacing a clip in the Construction window with another clip of the same duration.

The Paste Custom command pastes part or all of a clip, or a subset of its attributes (such as filters, motion settings, fade control, or transparency settings), into a selected clip or selected area of the Construction window.

To paste a clip and change its duration to match a selected area:

1 Select a clip in the Project, Clip, or Construction window, and choose Copy from the Edit menu.

2 Select the area or clip in the Construction window where you want to paste the clip.

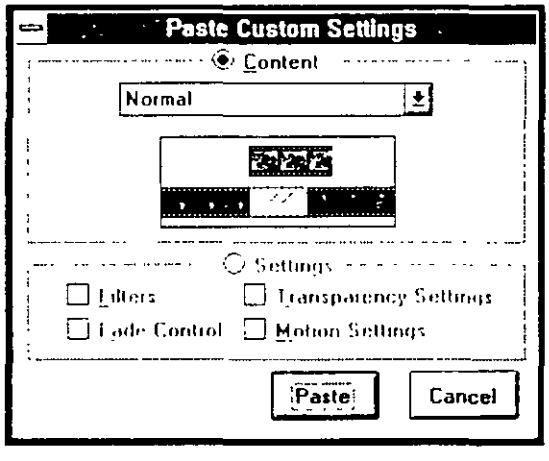
3 Choose Paste to Fit from the Edit menu.

To paste a clip and choose how to affect the contents of the Construction window:

1 Select a clip in the Project, Clip, or Construction window, and choose Copy from the Edit menu.

2 Click a track or a clip in the Construction window to select a destination for pasting the clip.

3 Choose Paste Custom from the Edit menu. The Paste Custom Settings dialog box appears.



4 Click Content to select a method for pasting a clip into the Construction window. The Content options allow you to adjust the duration of clips in the Construction window to accommodate the pasted clip, or vice versa. The Paste Custom dialog box displays an animated representation of the selected paste operation.

5 Choose from the following Content options:

- Normal. Pastes the source (copied) clip onto the destination (paste) area you select. If the source clip is larger than the destination area, the source clip's out point is adjusted to fit the destination area. However, if the source clip is smaller than the destination area, the unused portion of the destination area remains blank (black).
- Move Source Out Point. Adjusts the source clip's out point to fit the destination space.
- Move Destination In Point. Adjusts the destination clip's in point to accommodate the duration of the source clip.
- Move Source In Point. Adjusts the source clip's in point to fit the clip into the destination space.
- Move Destination Out Point. Adjusts the destination clip's out point to accommodate the duration of the source clip.
- Change Speed. Increases or decreases the source clip's speed (and, as a consequence, its duration) to accommodate the destination space. If the destination space is smaller than the source clip, the speed of the clip increases. If the destination space is larger than the source clip, the speed decreases. For more information on changing a clip's speed, see "Setting the Forward or Backward Speed of Clips" on page 95.
- Shift Linked Tracks. Shifts all clips on the track (and linked clips on other tracks) to accommodate the duration of the source clip (which may initially be smaller or larger than that of the destination area).
- Shift All Tracks. Shifts clips on all tracks to accommodate the duration of the source clip.

6 Click Paste.

To paste a clip's attributes to other clips:

1 Select the clip in the Construction window whose attributes you want to copy, and choose Copy from the Edit menu.

2 Select the clip onto which you want to paste the attributes.

3 Choose Paste Custom from the Edit menu. The Paste Custom Settings dialog box appears.

4 Click Settings to select options for pasting the filters, motion settings, fade controls, or transparency settings from the clip on the Clipboard to the clip selected in the Construction window.

5 Click Paste.

SPLITTING CLIPS

This section describes how to use the Construction window to split a single movie or audio clip into two or more independent clips. It also describes how to split multiple clips and how to select and move a block of clips.

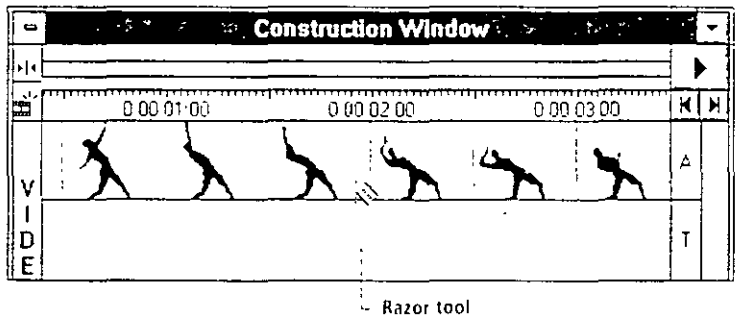
When you split a clip, you are actually creating two copies of the clip, and the Project window is updated to show two clips instead of one. Both clips still point to the entire source clip. If you split the video or audio portion of a linked clip, both parts of the clip are affected.

To split a clip at a precise frame, you can first split it at an approximate location and then use the Trimming window to refine the cut to the exact frame. Although you cannot rejoin the new clips into one clip, you can restore either of the split portions to the original clip by using the Trimming window to adjust the cut point. For information on using the Trimming window, see "Trimming Clips in the Trimming Window" on page 83.

You can lock a track in the Construction window so that clips on the track are not affected by editing on other tracks. For more information on track locking, see "Locking Tracks in the Construction Window" on page 94.

To split a clip into two clips:

Select the razor tool in the Construction window, and click anywhere on the clip. The clip splits into two separate clips, and a new clip is added to the Project window. Each clip reflects its individual duration, with new settings for the in point or out point.



To split the clips on all unlocked tracks, hold down the Alt key and click the razor tool.

For more precision when splitting a clip, you can change the time unit in the Construction window to display more frames, or you can use the zoom tool to zoom in on the area.

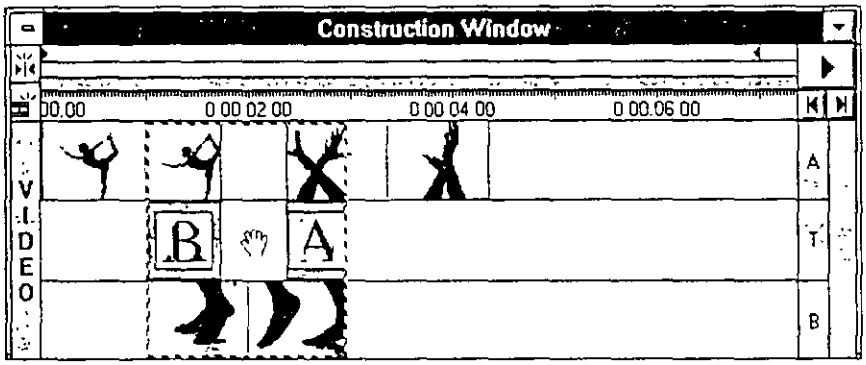
Note: *Double-click the razor tool (or press Shift+R) to use the tool for more than one operation.*

To copy a block of clips using the block select tool:

1 Select the block select tool in the Construction window, and drag to create an area of equal width across all tracks.

2 Move the block select tool anywhere inside the selected area and press the Alt key. The pointer turns into the hand tool.

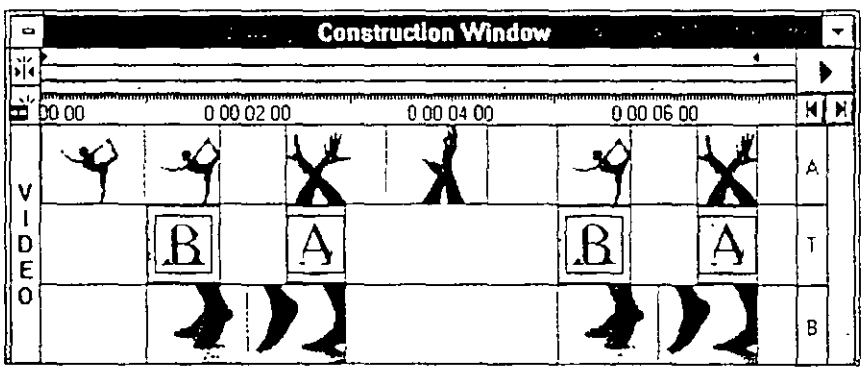
Note: *If you do not use the Alt key with the block select tool, the tool functions as a virtual clip selector. For more information on virtual clips, see "Working with Virtual Clips" on page 101.*



Selected block of clips

3 Drag to copy the selected block of clips to a valid area in the Construction window. A *valid area* is an empty area of equal or greater width than the selected block of clips. When you locate a valid area, all tracks in the Construction window are highlighted.

4 Release the mouse button and the Alt key to place the block of clips in the new location. The Project window is updated to show any new clips that were created.



Selected block of clips moved to a new location

Note: *If you include linked clips in your copied selection, the new set of clips will not retain the original links.*

PERFORMING INSERT AND OVERLAY EDITS

There are three types of insert edits that you can perform in the Construction window. You can drag a clip between existing clips in the Construction window. You can split clips at a point in the time ruler and insert or overlay a clip. As a third option, you can insert a clip by setting the work area to a specific location and size and then replacing the frames under the work area with the same number of frames from the new clip.

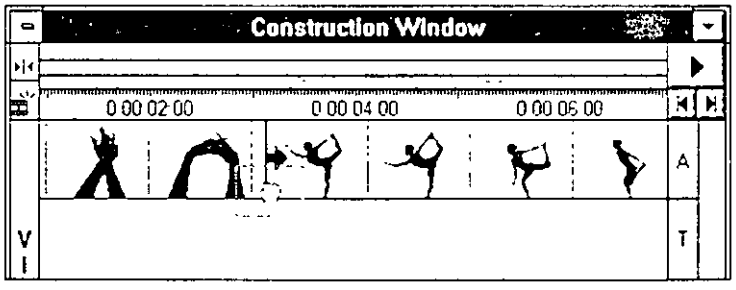
When inserting clips, you can lock clips and transitions on other tracks to prevent them from shifting. Locking tracks is useful, for example, if you want to insert a video clip in your movie without altering an audio track. For information on locking tracks, see "Locking Tracks in the Construction Window" on page 94.

Inserting a clip between two clips

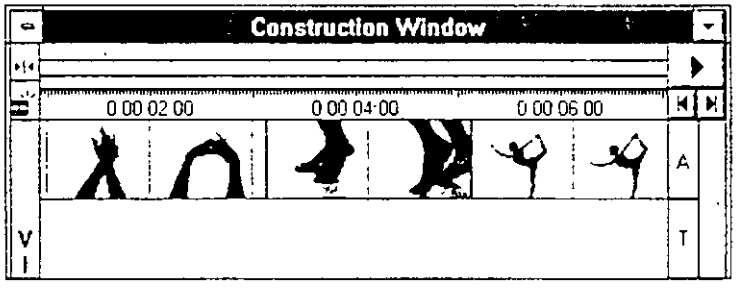
You can drag a clip between existing clips in the Construction window. When you insert a clip between two clips, the clips and transitions on all unlocked tracks shift right (ripple) to make room for the new clip.

To insert a clip between two clips in the Construction window:

Drag a clip from the Project, Clip, or Construction window to the joint between two clips. (From the Project window, you can select multiple clips to insert.) The joint appears highlighted when the clip is positioned correctly. When you release the mouse button, the clip is inserted, and all clips and transitions on unlocked tracks shift to the right to make room for the new clip.



Before insert



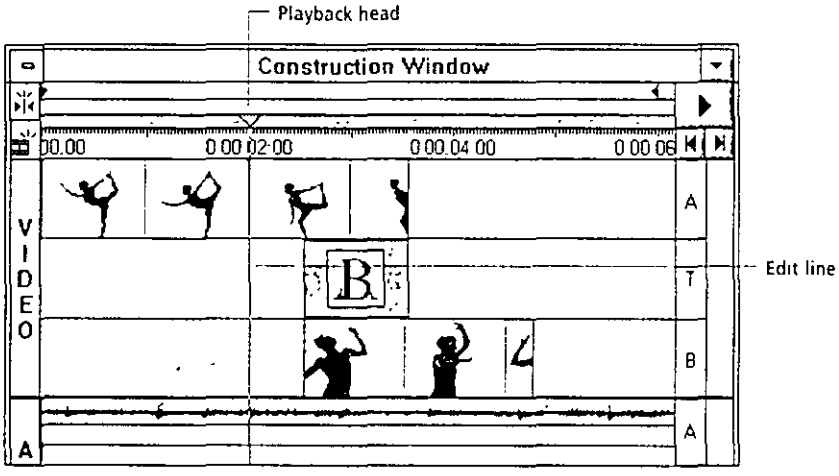
After insert

Inserting or overlaying clips using the edit line

You can insert a clip onto track A by splitting clips at the edit point in the timeline. You can insert a clip in one of two ways: by shifting the contents of all unlocked tracks to the right of the split to make room for the new clip, or by overlaying the new clip on the existing material to the right of the edit point and by the full length of the clip between the in and out points. When you overlay a clip, depending on the material to the right of the edit point, you may replace frames from more than one clip;. Wherever the new clip ends, a new cut point appears.

To insert or overlay a clip using the edit line:

1 Click in the dark gray area above the time ruler to move the edit line to the point in the Construction window where you want to insert or overlay a clip.

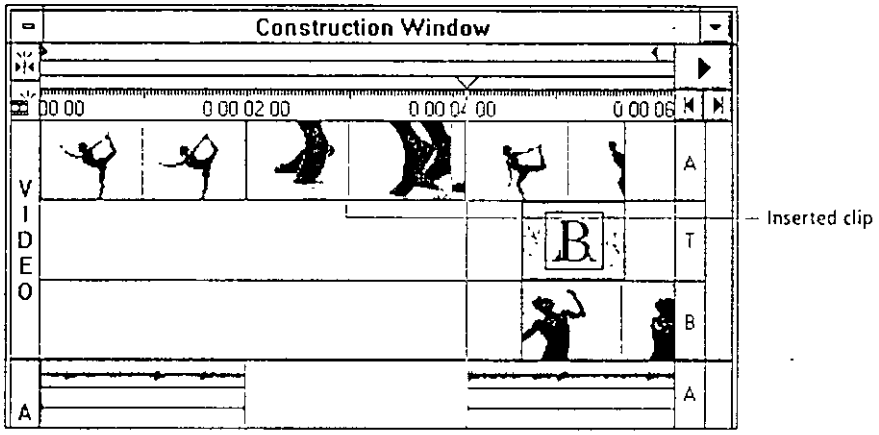


The Controller window appears, and the frame under the edit line appears in the Preview window.

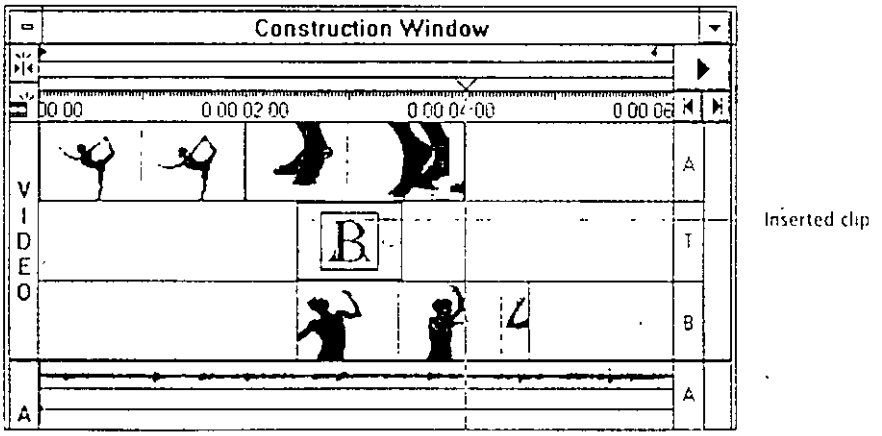
2 To move the edit line to the exact location for the split, drag the playback head in the Construction window, or use the Controller window to precisely position the edit line. For information on using the Controller window to position the playback head, see "Using the Controller" on page 120.

3 Select the clip you want to insert or overlay from the Project, Library, or Sequence window, or open the clip in a Clip window using one of the methods described in "Opening a Clip in a Clip Window" on page 69.

4 To insert the clip on track A and shift the contents of other tracks, choose Copy to Construction > Insert at Edit Line from the Edit menu. The clips and transitions on all unlocked tracks split at the edit point and shift to the right to make room for the inserted clip. The inserted clip and the new clips created by the split are also added to the Project window.



5 To overlay the clip on track A, replacing the frames to the right of the split, make the Clip window active and choose Copy to Construction > Overlay at Edit Line from the Edit menu. Only the clip on track A is split at the edit point, and the inserted clip replaces frames to the right of the split. The inserted clip and the new clips created by the split are also added to the Project window.



Inserting clips to fill the work area

You can insert a clip by setting the work area bar to a specific location and size and then replacing the frames under the work area bar with the same number of frames from the new clip. The clips on track A are split at the beginning and end of the work area, and the new clip fills the space between.

To insert a clip over frames in the work area:

1 Position the work area bar over the location where you want to insert the clip. For information on positioning the work area bar, see "Compiling Effects and Transitions" on page 121.

2 Select the clip you want to insert from the Project, Library, or Sequence window, or open the clip in a Clip window using one of the methods described in "Opening a Clip in a Clip Window" on page 69.

3 Choose Copy to Construction > Replace Work Area from the Edit menu. The inserted clip replaces all frames under the work area bar. The inserted clip and the new clips created by the split are also added to the Project window.

LOCKING TRACKS IN THE CONSTRUCTION WINDOW

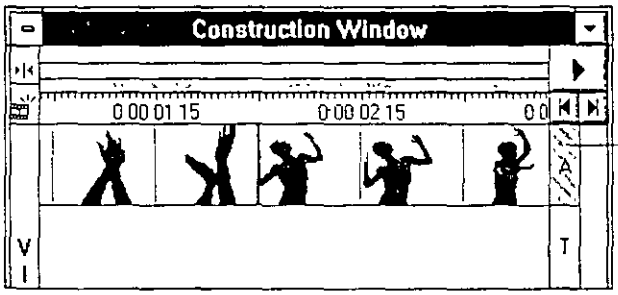
During some editing procedures, you can lock tracks in the Construction window to prevent clip movement on other tracks from affecting the clips or transitions on the locked track. Track locking is particularly useful, for example, if you want to insert a video clip in your movie without affecting clips on an audio track. Conversely, you may want to edit an audio clip without affecting clips on a video track. This type of editing is often referred to as "L" editing.

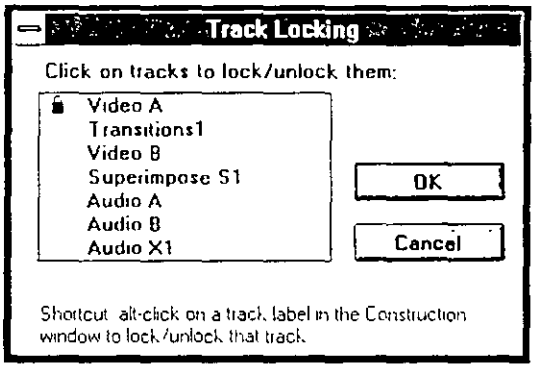
A locked track is marked by orange and yellow bars across the label.

To lock or unlock a track, use one of the following methods:

- Hold down the Alt key and click the track label located to the right of the track.

• Choose Lock/Unlock Tracks from the Project menu, and click the track name in the Track Locking dialog box (locked tracks are indicated by a padlock icon).





SETTING THE FORWARD OR BACKWARD SPEED OF CLIPS

You change a clip's speed by applying a rate factor or setting a new duration for the clip in the Clip Speed dialog box. The default clip speed is 100 percent for both movie and audio clips. You can set a speed from between –10,000 percent and 10,000 percent. A negative percentage causes the clip to play backwards. When you change a clip's speed, the Project and Info windows reflect the new setting.

Changing the clip speed effectively reduces or multiplies the number of frames in the original clip; this affects the quality of motion in movie clips and the quality of sound in audio clips, as well as the clip's duration. For example, setting a movie clip's speed to 50 percent (or doubling its duration) creates a slow-motion effect by doubling the number of frames and extending the clip's original duration; setting its speed to 200 percent (or halving its duration) doubles the speed of the clip, creating a high-speed effect and halving the clip's original duration.

Note: *If you are working with 60 fields-per-second (fps) clips, and you slow down the clip speed, make sure that Deinterlace When Speed is Below 100% is selected in the Field Options dialog box. Similarly, if you are working with 60-fps clips, and you are reversing the clip.*

direction, make sure that Reverse Field Dominance is selected in the Field Options dialog box. Setting these field options eliminates possible jerky motion. For more information on working with fields, see "Full-Field Processing of Clips" on page 208.

To set the speed for a movie or audio clip:

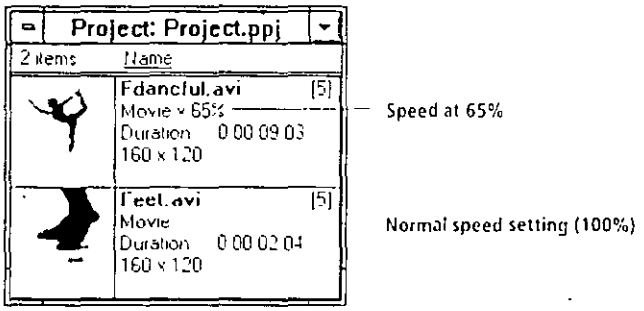
1 Select the movie or audio clip from the Project window or the Construction window.

2 Choose Speed from the Clip menu.

3 Enter a rate value from –10,000 percent to 10,000 percent, or enter a new duration in the SMPTE timecode format.

4 Click OK.

The movie or audio clip is set to the new speed, and the speed value appears next to the clip type in the Project window. If you selected multiple clips, the Clip Speed dialog box reappears for each clip.



CREATING FREEZE-FRAMES FROM VIDEO CLIPS

You can *freeze* the specific frame in a clip that you want to hold for the duration of the clip. Freezing a frame creates the same effect as a still image. You can freeze the clip's in point, out point, or marker 0.

To create a freeze-frame:

1 Set the in or out point on the frame on which you want to freeze. Alternately, place marker 0 at the frame. For information on setting in and out points, see "Trimming Clips" on page 76. For information on setting place markers, see "Setting Place Markers in Clips" on page 74.

2 Select the clip in the Construction window, and choose Frame Hold from the Clip menu. The Frame Hold dialog box appears.

3 Choose In Point, Out Point, or Marker 0 from the pop-up menu.

4 If you are working with 60-fps video, select Deinterlace to remove any jittering that freezing a frame could cause. For information on working with fields, see "Full-Field Processing of Clips" on page 208.

5 Click OK.

BLENDING FRAMES

When the frame rate of a movie is slower than the frame rate at which a clip was captured, Adobe Premiere reduces the number of frames that it shows when the clip is played. For example, if a clip was captured at 30 fps but the movie is being played at 10 fps, Adobe Premiere shows every third frame to achieve a 10 fps rate, which causes the clip to be jerky.

You can blend frames so that the clip plays more smoothly. When you blend frames, Adobe Premiere interpolates the data in the sampled frames to smooth the transition between them rather than just "jumping" from one sampled frame to the next.

Even if the source clip and the movie have the same frame rate, you can create special effects by setting an alternate frame rate for the clip and blending frames. For example, if your source clip was captured at 30 fps but you set the clip's rate to 10 fps, Adobe Premiere shows every third frame to create a halting effect (similar to using the Posterize Time filter). You can then use the Frame Blending option to blur the frames.

To blend frames:

1 Select the clip in the Construction window.

2 Choose Frame Hold from the Clip menu. The Frame Hold dialog appears.

3 To set an alternate frame rate for the clip, select Alternate Rate and type a frame rate in the text box. Adobe Premiere displays a new frame at the interval you specify, which effectively lowers the frame rate of the clip.

4 Select the Frame Blending option.

5 Click OK.

SEPARATING AND REJOINING LINKED CLIPS

At times, you may want to separate the linked audio and video portions of a clip in the Construction window so that the audio can lead the video, or vice versa. You can separate linked clips by breaking the link completely or by temporarily releasing the link and repositioning a portion of the clip.

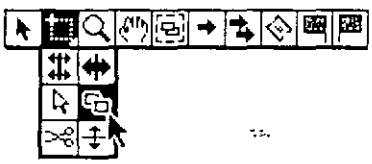
There are two possible types of links between audio clips and video clips in Adobe Premiere: hard links and soft links. When the linked audio and video clips originate from the same movie file, they are *hard linked*, and only one clip appears in the Project window. A hard link is established before the clip is imported into an Adobe Premiere project. After a hard link is broken, two separate clips are created. A hard link cannot be reestablished.

A *soft link* is a link made in the Construction window. You can create a soft link between any audio clip and any video clip in the Construction window (provided that the clips are not already part of a hard link). Soft linking provides a way to rejoin clips that were once hard linked. A soft link behaves just like a hard link, but the linked clips remain as separate entities in the Project window.

To create a soft link between an audio clip and a video clip:

1 Select an audio or video clip in the Construction window.

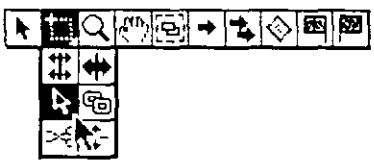
2 Choose the soft link tool from the extended tools pop-up menu in the lower-left corner of the Construction window.



3 Click the clip that you want to link. If the clip is already part of a hard link, you cannot include it in a soft link. If the clip is already part of another soft link, the new soft link will replace the old soft link.

To temporarily release a link for positioning:

1 Select the link override tool from the extended tools pop-up menu in the lower-left corner of the Construction window.



2 Select the video or audio portion of the linked clip and drag it to the desired location.

The selected portion will move independently of the linked portion. The link is reestablished when you release the keys and the mouse button. Small, red triangles appear on the left edge of the video and audio portions of the linked clip to indicate that the video and

audio are now out of sync. Click on either of the triangles to see by how many frames the video and audio are out of sync. To resynchronize the video and audio, drag to select the displayed amount.

Note: *Links are also temporarily released when you cut the video or audio portion of a linked clip from the Construction window. The link is reestablished when the cut portion is pasted from the Clipboard back into the Construction window. For information on pasting clips in the Construction window, see "Pasting Clips or Clip Attributes in the Construction Window" on page 86.*

To break a hard or a soft link:

1 Select the clip in the Construction window.

2 Choose Break Link from the Edit menu.

The audio and video portions become separate clips, allowing you to arrange them individually in the Construction window. An unnumbered marker is assigned to the midpoint of the newly independent audio and video clips. You can synchronize audio and video clips by aligning the markers in the Construction window. For more information on aligning clips, see "Setting Place Markers for Clip Alignment" on page 72.

MIXING AUDIO CLIPS

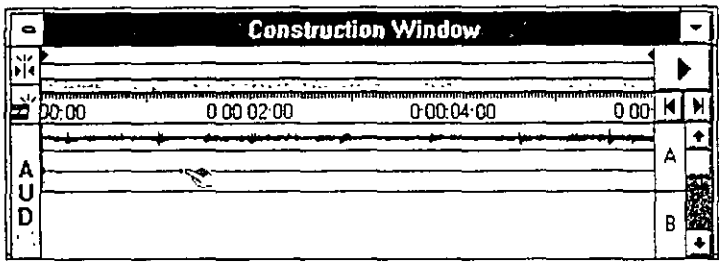
You can have up to 99 audio tracks playing simultaneously in an Adobe Premiere movie. Layering the audio clips on these tracks is similar to sound mixing in audio and television production.

The thumbnails for audio clips show images of audio waveforms. Each audio track has an Audio Fade control that lets you adjust the volume, or levels, of the clip. By default, the Audio Fade control is initially set to mid-volume, which is equivalent to 0 decibels on the meter of a tape recorder.

You can also adjust the gain of the entire audio clip while leaving intact any level adjustments that have been made to the clip.

To adjust the levels of an audio clip:

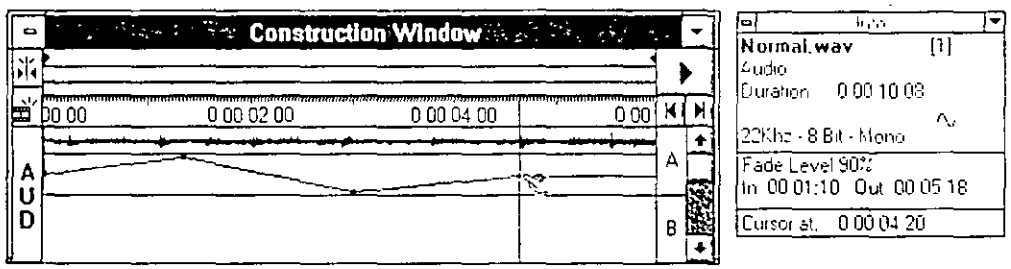
1 Position the pointer on the middle line in the Audio Fade control section at the bottom of an audio track in the Construction window. The pointer changes to the finger pointer.



2 Click to create a handle (a black dot). You can create as many handles as needed.

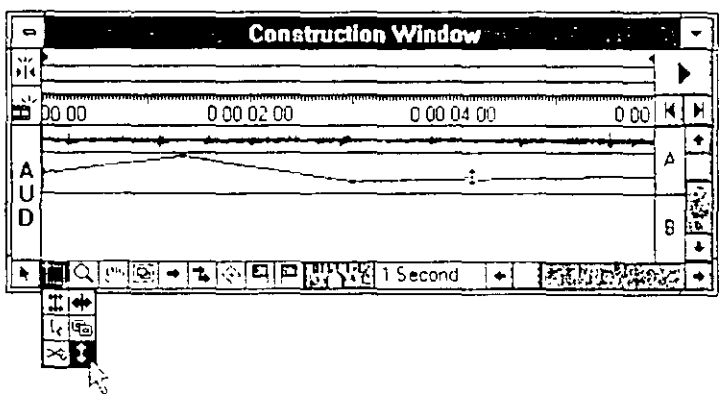
3 To delete a handle, drag it out of the Audio Fade control area.

4 Drag the handles up or down to define when the audio clip fades in or out.



A line appears between the handles, indicating whether the audio clip is fading in or out: an ascending line shows audio fading in; a descending line shows audio fading out. The Info window is updated as you adjust the Audio Fade control.

5 To adjust a segment between two handles uniformly, select the fade adjustment tool in the extended tools pop-up menu in the lower-right corner of the Construction window, and drag the segment up or down.



6 To make a cut in the Audio Fade control, select the fade scissors tool in the extended tools pop-up menu in the lower-left corner of the Construction window, and click in the Audio Fade control. Doing so creates two handles next to each other. These handles are useful for making adjustments that sharply increase or decrease the volume for the clip at a point.

To adjust the gain of an audio clip:

1 Select the audio clip in the Construction window.

2 Choose Gain from the Clip menu.

3 Enter a value from 1 percent to 200 percent.

Previous adjustments made to the Audio Fade control do not change.

Note: *You can increase the gain if your original recording was recorded too softly. Increasing the gain of a well-recorded audio clip, however, may cause distortion that is not noticeable through your computer's speakers but is noticeable on the playback computer or on videotape. For the best audio results, you should adjust the levels of the recording before digitizing it.*

WORKING WITH VIRTUAL CLIPS

Adobe Premiere allows you to treat any segment of tracks along the time ruler as an independent clip, called a *virtual clip*. A virtual clip is a link to all clips in a selected segment of the Construction window. With virtual clips you can do such things as mix the A and B video sources with a transition and then apply motion settings to the mix, or use the mix as a source in another transition. Any changes you make to the source clips of a virtual clip affect the virtual clip.

Creating a virtual clip is similar to creating an independent block of clips. Once you create a virtual clip, it is treated like an ordinary clip. It can be placed on any video or audio track in the Construction window, and it can be moved, copied, and pasted like any other clip. You can also apply motion settings and filters to a virtual clip.

A virtual clip can be used as a source clip in another virtual clip. Adobe Premiere allows an original clip to be used in up to 16 levels of virtual clips. The default depth setting is eight levels. Processing virtual clips with many levels requires a great deal of processing time and memory. If you are running out of memory when you compile virtual clips (you'll see orange and black bars in the Preview window or Clip window), you should limit the maximum depth of virtual clips. You can change the maximum depth by choosing Preferences > Virtual Clips from the File menu and selecting a new depth.

Adobe Premiere uses a feature called *safe layers* that affects the way the track selector works when virtual clips are included on a track. To preserve virtual clips as they were originally created, the track selector includes all tracks that contain source clips for the virtual clips on the selected track. When the selected track is moved in the Construction window, all other tracks associated with the virtual clips are moved accordingly. In this way, the virtual clips are preserved. Safe layers is the default mode for working with tracks. The option can be turned off by deselecting the Maintain Virtual Clip Source Areas option in the General Preferences dialog box.

For illustrated examples of how to use virtual clips, see "Using Virtual Clips to Nest Transitions" on page 264 and "Creating a 360-Degree Presentation" on page 266.

Creating virtual clips

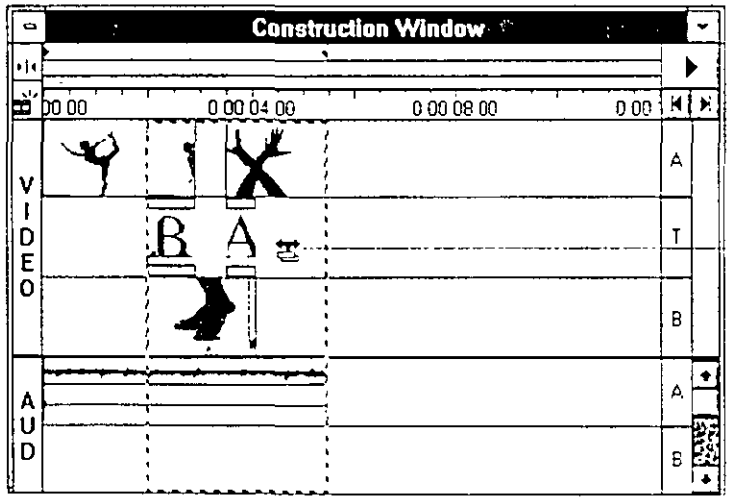
For creating virtual clips, it is recommended that you designate an area of your Construction window that is outside the time ruler of your actual movie, preferably before the beginning of the movie. This will minimize confusion over safe layers and ensure that you don't inadvertently make changes to the source clips of your virtual clips as you edit your movie.

To create a virtual clip:

1 Select the block select tool by clicking its icon in the Construction window or by pressing B on the keyboard.

2 Drag to create a block that encompasses all tracks across the desired segment of the time ruler.

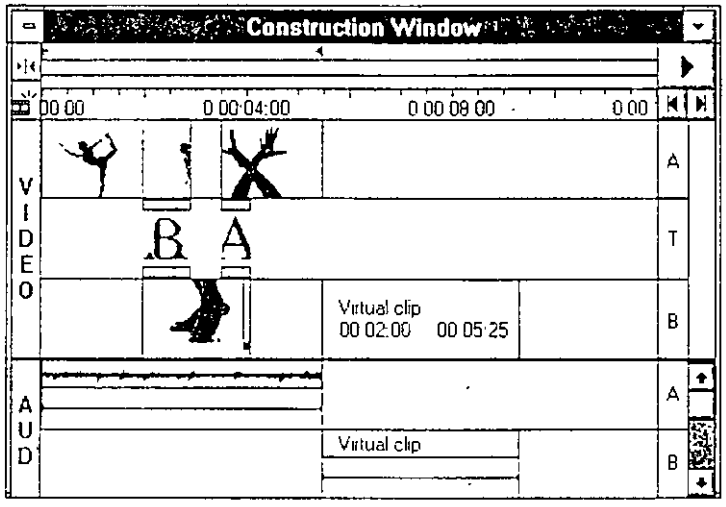
3 Move the block select tool anywhere inside the block. The pointer turns into the virtual clip pointer.



Virtual clip pointer

4 Click inside the block and drag to the desired location in the Construction window. A valid location for the clip is indicated by a solid black box the size of the clip.

5 Place the virtual clip at the desired location by releasing the mouse button.



Note: You can create a virtual clip of only the video tracks or the audio tracks by holding down the Alt and Shift keys while clicking inside either the video or the audio portion of the block selection.

To determine the origin of a virtual clip:

Select the virtual clip in the Construction window and choose Find Clip from the Clip menu, or double-click the virtual clip in the Construction window. A block area showing the boundaries of the original selection appears in the Construction window.

Viewing virtual clips

You can view a virtual clip in the Construction window by name or by icon. The name view includes the starting and ending points of the virtual clip's origin in the Construction window. In icon view, the thumbnails show a compiled version of the clip. These may take considerable time to generate, especially if there are virtual clips within virtual clips. For faster redisplaying of the Construction window, the default view of virtual clips is set to viewing by name.

To display virtual clip thumbnails in the Construction window:

1 Choose Preferences > Virtual Clips from the File menu. The Virtual Clip Preferences dialog box appears.

2 Deselect the option for viewing virtual clips by name only.

Applying filters to virtual clips

It can take considerable time for Adobe Premiere to preview, compile, or even generate icons for virtual clips if they include the use of many filtered clips.

To set options for applying filters to virtual clips:

1 Choose Preferences > Virtual Clips from the File menu. The Virtual Clip Preferences dialog box appears.

2 Choose one of the following options for controlling how video filters are applied to virtual clips:

- Never leaves out any of the source clip's filters when compiling virtual clips.
- Always includes all filters when compiling both the thumbnails and the final movie.
- Larger than Icons applies filters only when the final movie is compiled. This option improves performance when thumbnails are being generated in the Construction window.

CREATING BACKGROUND COLOR MATTES

Adobe Premiere lets you create a full-frame matte of solid color that you can use as you would a clip. This feature is useful, for example, if you want to superimpose titles over a solid-colored background. It is also useful when you want to fade to black in your movie.

To add a background matte:

1 Choose Add Color Matte from the Project menu. The color picker appears.

2 Select a color for the matte using the color picker, and click OK. The Color Matte dialog box appears. For information on using the color picker, see "Using the Premiere Color Picker" on page 141.

3 Enter a name and duration for the new matte, and click OK. The matte appears as a Background Matte clip in the Project window, listed alphabetically under its assigned name.

4 Drag the matte from the Project window to a video track in the Construction window. You can lengthen the matte's playing time by dragging either edge of the matte. If you want to reuse the matte later, use the Library feature to store the matte.

EDITING CLIPS IN OTHER APPLICATIONS

This section discusses how to export clips and edit them in other graphics applications. For example, you can export a clip to Adobe Photoshop, modify the clip, and then reopen the file in Adobe Premiere.

Exporting clips for editing in other applications

You can export a frame of a clip as a bitmapped file and modify the file in an image-editing application, such as Adobe Photoshop. You can export an audio clip as a waveform file and modify it in a sound-editing application, such as Turtle Beach's Wave Tools™ for Windows or Microsoft Windows WaveEdit.

You can use the Make Movie command to compile a movie clip as a Filmstrip format file or as a sequence of numbered bitmapped, TIFF, or Targa files for editing in Adobe Photoshop. In this manner, you can create filmstrips or numbered sequences from all or part of the Construction window. You can also compile a movie clip as an FLC/FLI format file for editing in an animation program, such as Autodesk™ Animator Pro. For more information on using the Make Movie command, see "Compiling a Movie" on page 203.

To export a frame as a bitmapped file:

1 From the Clip window, select the single frame you want to save as a bitmapped image.

2 Choose Export > Frame as Bitmap from the File menu. The Export Frame dialog box appears.

3 Type a name for the file and click OK.

To export a clip as an animation file:

1 From the Clip window, select only the frames you want to include in the animation file by setting the in and out points in the clip.

2 Choose Export > FLC/FLI from the File menu. The FLC/FLI File Export dialog box appears.

3 Choose a frame rate between 1 fps and 30 fps from the Rate drop-down list at the bottom of the dialog box.

4 Specify the image dimensions for the animation file. To keep the clip's aspect ratio, select the Keep Aspect option.

5 Type a name for the file, and click OK.

Exporting clips for editing in other applications

You can export a frame of a clip as a bitmapped file and modify the file in an image-editing application, such as Adobe Photoshop. You can export an audio clip as a waveform file and modify it in a sound-editing application, such as Turtle Beach's Wave Tools™ for Windows or Microsoft Windows WaveEdit.

You can use the Make Movie command to compile a movie clip as a Filmstrip format file or as a sequence of numbered bitmapped, TIFF, or Targa files for editing in Adobe Photoshop. In this manner, you can create filmstrips or numbered sequences from all or part of the Construction window. You can also compile a movie clip as an FLC/FLI format file for editing in an animation program, such as Autodesk® Animator Pro. For more information on using the Make Movie command, see "Compiling a Movie" on page 203.

To export a frame as a bitmapped file:

1 From the Clip window, select the single frame you want to save as a bitmapped image.

2 Choose Export ≥ Frame as Bitmap from the File menu. The Export Frame dialog box appears.

3 Type a name for the file and click OK.

To export a clip as an animation file:

1 From the Clip window, select only the frames you want to include in the animation file by setting the in and out points in the clip.

2 Choose Export > FLC/FLI from the File menu. The FLC/FLI File Export dialog box appears.

3 Choose a frame rate between 1 fps and 30 fps from the Rate drop-down list at the bottom of the dialog box.

4 Specify the image dimensions for the animation file. To keep the clip's aspect ratio, select the Keep Aspect option.

5 Type a name for the file, and click OK.

To export an audio clip to a waveform file:

1 Open the audio clip you want to export to a waveform file.

2 Choose Export > Waveform File from the File menu. The Export Waveform File dialog box appears.

3 Choose the desired options for audio rate and audio format, and click OK.

Modifying filmstrips in Adobe Photoshop

You can open a Filmstrip format file in Adobe Photoshop for editing. The filmstrip is a single file that contains all of the frames of the original movie clip. If your original clip was recorded with its timecode and a reel name, this information will be preserved in the filmstrip.

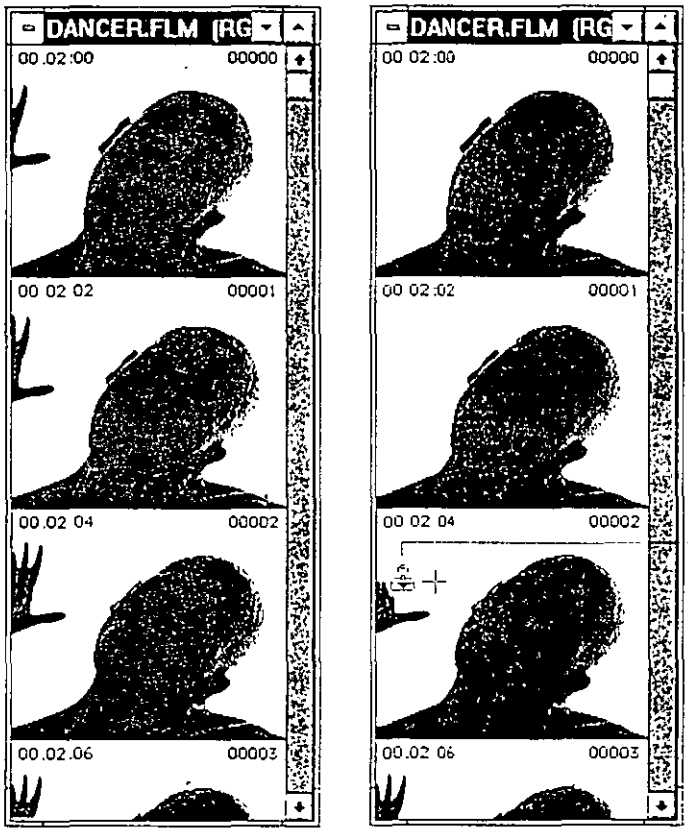
After saving the edited filmstrip in Adobe Photoshop, you can use the filmstrip as a clip in any Adobe Premiere project. You can also use Adobe Premiere to create a Video for Windows or QuickTime movie of the edited filmstrip.

To modify a filmstrip in Adobe Photoshop:

1 Open Adobe Photoshop, and choose Open from the File menu.

The filmstrip opens as a series of frames in a column, with each frame labeled by number and timecode. The number of frames displayed depends on the duration of the clip and the frame rate you selected when you created the filmstrip.

2 Make the desired modifications to the filmstrip.



When editing a filmstrip in Adobe Photoshop, use the following guidelines for best results:

- Channels 1 through 4 (RGB and alpha) can be freely edited.
- Do not resize or crop the filmstrip.
- Drawing on the gray lines dividing the frames of the filmstrip does not affect the file's structure.

3 As desired, cut, copy, move, and paste selections using the Adobe Photoshop editing features. To align selections from frame to frame, use the arrow keys and the Shift, Alt, and Ctrl keys in conjunction with Adobe Photoshop's normal keystroke operations as follows:

- To cut a selection and move it to the same position within an adjacent frame, hold down the Shift key and press the Up Arrow or Down Arrow keys.
- To copy a selection and move it to the same position within an adjacent frame, hold down the Alt+Shift keys and press the Up Arrow or Down Arrow keys.
- To move only a selection border to the same position within an adjacent frame, hold down the Ctrl+Alt keys and press the Up Arrow or Down Arrow keys.

4 View the filmstrip as a simulated movie clip and preview your modifications by holding down the Shift key and pressing the Page Up or Page Down keys to display the frames in sequence. For the best results, resize the window to slightly larger than a single filmstrip frame.

5 Save your modifications using the Save or Save As command, saving the file in the Filmstrip file format.

Note: *Only images that were exported from Adobe Premiere in the Filmstrip file format can be saved or exported in the Filmstrip file format from Adobe Photoshop.*

6 Import the filmstrip into an Adobe Premiere project using the Import command from the File menu, or open the file in a Clip window using the Open command from the File menu.

To create a Video for Windows or QuickTime movie from a filmstrip:

1 Import the filmstrip into an Adobe Premiere project.

2 Drag the filmstrip clip to a portion of the Construction window.

3 Compile the filmstrip into a Video for Windows or QuickTime movie by using the Make Movie command. For information on compiling movies, see "Compiling a Movie" on page 203.

GENERATING AN EDIT DECISION LIST

This section describes how to generate an Edit Decision List (EDL) from the Construction window for online editing of source videotape in a post-production studio.

About online and off-line editing

Adobe Premiere can be used for both *online* and *off-line* editing of digital video. Traditionally, online editing has meant working with original (source) videotapes to produce a master tape for broadcast or distribution. This requires the use of high-end video equipment that is usually found only in high-cost editing suites. With digital video, online editing is essentially editing for final finished output. If you are using Adobe Premiere to create a Video for Windows or QuickTime movie or to output a movie to videotape, then you are performing online editing.

Off-line editing has traditionally meant working with copies of original tapes and low-cost equipment to make editing decisions. The editing decisions are recorded in an EDL. The EDL contains a list of all of the clips, transitions, and special effects in the movie. It is used to assemble a new movie (master) from the source tapes in an online editing suite. Off-line editing allows you to use expensive online editing time more efficiently.

With Adobe Premiere, you have the ability to create machine-readable EDLs from your digitized source video. Unlike many off-line systems, Adobe Premiere shows you what a transition effect will look like. Also, you don't have to watch the off-line edit from beginning to end. Adobe Premiere allows you to preview any part you need to see.

Exporting an EDL

You can export EDLs from Adobe Premiere to many different formats, including the CMX 3400, CMX 3600, Grass Valley, Sony BVE, and any additional third-party plug-in modules. When you create an EDL in Adobe Premiere, the visual editing decisions you make in the Construction window are recorded in the EDL in text format. Once you have exported the editing decisions to any of the EDL formats, you can view and print the EDL by opening it in Adobe Premiere or in any word processor that supports a monospaced font (such as Courier), or output the EDL to a format that can be read directly by the editing system.

Note: *If you plan to export your EDL to the CMX or Grass Valley format, the file must be written to an appropriately formatted floppy disk. Products such as EDL Access™ (included with Adobe Premiere) create CMX-compatible and Grass Valley-compatible file format diskettes on the PC.*

If you intend to create videotapes from an EDL, it is important to work closely with a post-production house to achieve the best possible results. In general, Adobe Premiere provides many special effects that are unavailable on traditional editing systems. Your post-production editor can suggest alternate effects to use before assembling the final movie.

Note: *To avoid confusion when working with EDLs, you should use a time base of 29.97 fps in the Construction and Clip windows. If you set a time base of 30 fps, Adobe Premiere counts video frames in true 1/30ths of a second. Because all NTSC video is 29.97 fps, the timecode displayed in the Clip window may not match exactly with the visual timecode that is superimposed on the video image (the window dub). When an EDL is generated, however, Adobe Premiere makes the necessary adjustments so that the timecode burned into the source video matches the timecode in the EDL.*

To export a project to an EDL:

1 Make sure that all the clips in your Construction window have been assigned a timecode (either assigned at the time they were captured or entered by using the Timecode command in the Clip menu). If you do not set the timecode for a clip, Adobe Premiere assumes a starting time of 00:00:00:00. For more information on setting the timecode, see "Setting the Timecode for Clips" on page 116.

2 Choose Export from the File menu and the desired EDL format from the submenu. The Save EDL dialog box appears.

For most EDLs, you can enter the following options for the recording reel:

- Title for This EDL. Enter the title you want displayed in the header section of the EDL.
- Start Time Code. Enter the time at which you want recording to start on the record reel.
- Frame Rate. Determine the frame rate by the time base set in the Time Base Settings dialog box. The default frame rate is nondrop-frame timecode; select the Drop Frame option if you want drop-frame timecode.
- Audio Processing. See "Audio in the EDL" on page 114 for information on the audio export options.
- Level Notes. Choose an option from the drop-down list to include comments in your EDL pertaining to audio levels and superimpositions.
- Create B-roll/B-roll in Separate File. Create a transition in an EDL only if the clips are on different video source reels. The Construction window may contain edits across a single source reel. For example, there may be a dissolve from a clip on Reel 1 to another clip from Reel 1. These B-roll options allow you to generate a separate list of such conflicting edits. This list, called a B-roll conform list, is used by the post-production facility to make an additional source reel of clips used in transitions.

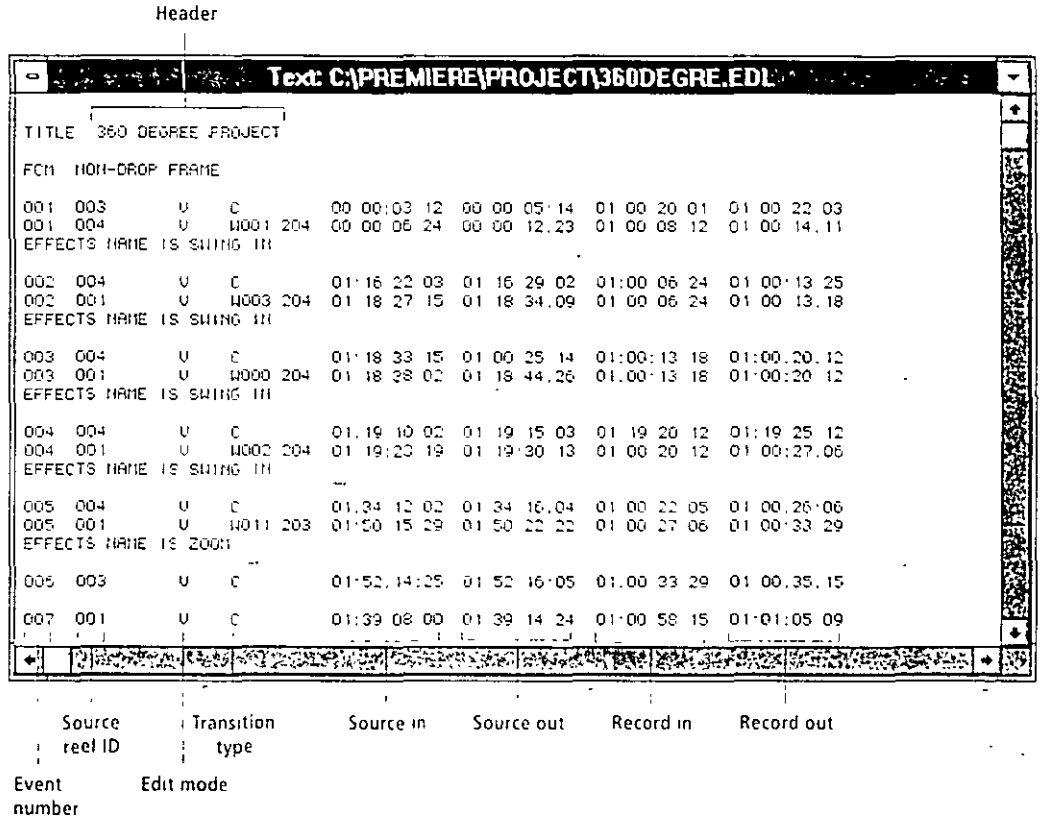
3 Click Wipe-Codes to bring up Adobe Premiere's Wipe Code Editor, and assign the wipe patterns to the codes used by your post-production facility. For more information, see "Transitions, Special Effects, and Superimposed Clips in the EDL" on page 112.

4 Click OK to close the Save EDL dialog box.

5 Type a name for the EDL and click OK. The EDL is generated and appears in a text window.

Components of the EDL

While slight differences exist among different EDLs, most contain eight primary columns and two auxiliary columns.



- Header. At the top of every EDL is the name of the list and the timecode in which the record was created (drop frame or nondrop frame).

- Event Number. The event number is an identifying counter, beginning at 1. An *event* represents a single edit. The event number can be important in the re-editing process, because it calls an individual event. Certain events may use more than one line of the EDL. Unnumbered lines accompanying events are called *notes* or *comments*.

- Source Reel ID. The source reel ID is the name or number of the videotape containing the clip.

- Edit Mode. The edit mode indicates whether the edits take place on the video track only (V), the audio track only (A), or a combination of both the video and the audio tracks (B).

- Transition Type. The transition type describes the type of edit: *C* represents a cut, *W* represents a wipe, *K* represents a key (superimposed), and *D* represents a dissolve.

- Source In and Source Out. The first two columns of the timecode are the source in and source out points. They describe the timecode of the first frame and the last frame of the clip as it appears on the source videotape.

- Record In and Record Out. The last two columns of the timecode represent the time at which the source clip is to be recorded on the master tape.

Transitions, special effects, and superimposed clips in the EDL

A standard EDL recognizes only the cut, the dissolve, and some wipe transitions. The EDL modules available in Adobe Premiere attempt to translate the edits from your project to the standard EDL format. For example, the Adobe Premiere effect named *Cross Dissolve* is interpreted as a "dissolve" transition by the standard EDL. Although many of the Adobe Premiere transitions cannot be adequately described in the EDL, the name of the Adobe Premiere effect is listed in a comment line in the EDL.

Adobe Premiere's filters and motion settings are completely ignored in a standard EDL. Superimposed clips are described as *keys*. The only transition permitted under a key is a Cut; other transitions under keys are removed from the EDL.

Many Adobe Premiere transitions correspond closely to wipe patterns that can be produced by a video switcher. Transitions that do not correspond to wipe patterns are interpreted as dissolves. The following list describes how Adobe Premiere transitions are interpreted by a standard EDL:

- The following transitions are interpreted as EDL Dissolves: Additive Dissolve, Channel Map, Cross Dissolve, Cross Stretch, Cross Zoom, Curtain, Displace, Dither Dissolve, Fold Up, Funnel, Image Mask, Luminance Map, Non-Additive Dissolve, Paint Splatter, Random Blocks, Random Invert, Slash Slide, Texturize, and Three-D.

- The following transitions are interpreted as EDL BarnDoor Wipes: Band Slide, Band Wipe, Barn Doors, Doors, Sliding Bands, Spin Away, and Split.

- The following transitions are interpreted as EDL Box Wipes: Iris Cross, Iris Diamond, Iris Point, Iris Shapes, Iris Square, Iris Star, Multi-spin, Spiral Boxes, Swirl, Tumble Away, Zoom, Zoom Boxes, and Zoom Trails.

- The following transitions are interpreted as EDL Circle Wipes: Clock Wipe, Iris Round, and Peel Back.

- The following transitions are interpreted as EDL Cross Split Wipes: Center Merge, Center Peel, and Center Split.

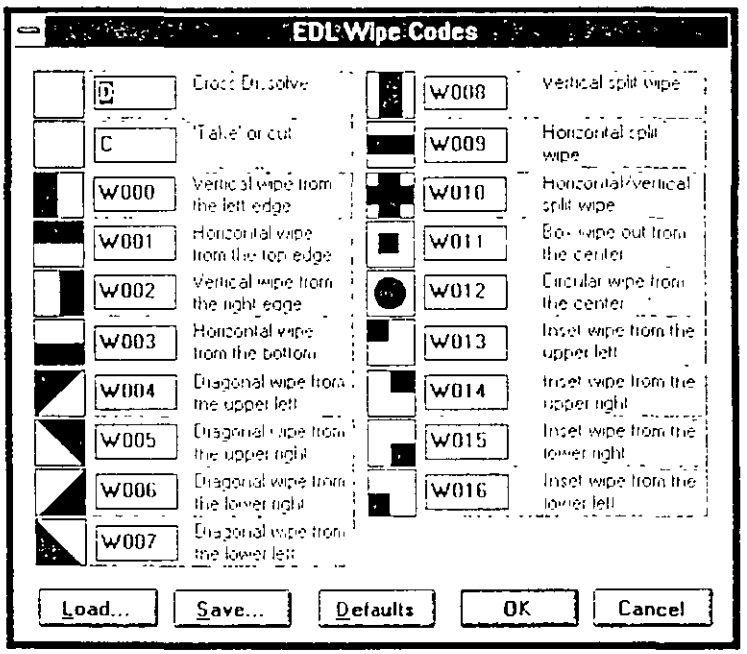
- The following transitions are interpreted as EDL Diagonal Wipes: Page Peel, Page Turn and Radial Wipe.
- The following transitions are interpreted as EDL Diagonal Wipes: Blocks, Checkerboard, Wedge Wipe, and Zig-Zag.
- The following transitions are interpreted as EDL Wipes: Cube Spin, Pinwheel, Push, Random Wipe, Roll Away, Slide, Sliding boxes, Stretch, Swing In, Swing Out, and Wipe.
- The following transitions are interpreted as EDL Horizontal Split Wipes: Stretch Over and Venetian Blind.
- The Inset transition is interpreted as an Inset Wipe.
- The Spin transition is interpreted as an EDL Vertical Split Wipe.

Video switchers interpret wipe patterns as codes. You can map the wipe patterns in the EDL to the wipe pattern codes used by your post-production facility using Adobe Premiere's Wipe Code Editor. Consult with your post-production facility to determine which wipe codes are used by their switchers. You can save EDL wipe code settings and load them when needed.

To assign wipe codes:

1 Choose Export from the File menu, and choose the desired EDL format from the submenu.

2 Click Wipe Codes. The EDL Wipe Codes dialog box appears.



3 Click the wipe icons to see the wipe transitions animated.

4 Enter the correct wipe codes for the wipe transitions that are used by your video switcher.

5 Load or save EDL Wipe Code settings using the Load or Save button at the bottom of the dialog box.

6 Click OK to apply the wipe codes to the EDL.

Audio in the EDL

Because Adobe Premiere works with Video for Windows and QuickTime movies, it controls sound in a way that differs significantly from traditional editing systems. Traditional tape-based editing systems are designed to record from (and to) one or more audio tracks on the videotape, or onto a separate audio tape recorder.

Adobe Premiere provides up to 99 audio tracks in the Construction window for placement of audio clips; however, both Video for Windows and QuickTime mix the audio tracks, creating a single track that can contain more than one channel (such as left and right). In Adobe Premiere, mixing of audio tracks is controlled by the fade controls that accompany each audio track. The standard EDL has no way to mix sound, except for the mixing that occurs when one audio source dissolves into another audio source.

To take advantage of multiple audio tracks on videotape, you can define which audio tracks from Adobe Premiere are mapped to the available tracks in the editing system.

To map audio tracks in the EDL:

1 Choose Audio Mapping from the Project menu. The EDL Audio Mapping dialog box appears.

2 Assign audio track A, audio track B, and the rest of the audio tracks to their EDL destination.

3 Click OK.

Adobe Premiere provides three output options for EDLs that affect how audio edits are added to an EDL. Consult your post-production house for a recommendation on which option to use.

Audio Follows Video option

The Audio Follows Video option causes the audio and video to be edited simultaneously, according to the edits made on the video track: where the video cuts, the linked audio clip cuts; where the video fades, the linked audio fades; and so on. With this option, the audio fade controls are ignored and any audio that is not linked to a video clip in the Construction window is dropped.

Audio Separately option

The Audio Separately option interleaves the audio and video tracks as separate edits within the EDL. For these options, the following rules govern the way that Adobe Premiere translates sound edits into a format that the EDL can interpret:

- If a clip on track A completely overlaps a clip on track B (it has the same or an earlier in point and the same or a later out point), only the clip on track A is considered.

Note: *A fade point of 0 in any clip effectively splits the clip at that point so that the clip is treated as two clips by the EDL.*

- If a clip on track A and a clip on track B overlap, a transition is created in the overlapping area so that the starting clip fades in to the ending clip.

- Clips on S tracks are considered only when neither track A nor track B contains clips; otherwise, they are ignored.

Once this single "track" has been created, the EDL interprets fade points in the following way:

- A fade point of 0 in any nontransition area creates a fade between 0 at that point and 100 at the next nearest point specified in the clip, regardless of the actual value that was specified for the nonzero point. All other nonzero fade points are ignored.

- Fade points in any transition areas (that is, areas of clips on tracks A and B that overlap) are ignored.

Audio at End option

The Audio at End option places all the sound edits together at the end of the EDL, following the audio translation rules used with the Audio Separately option.

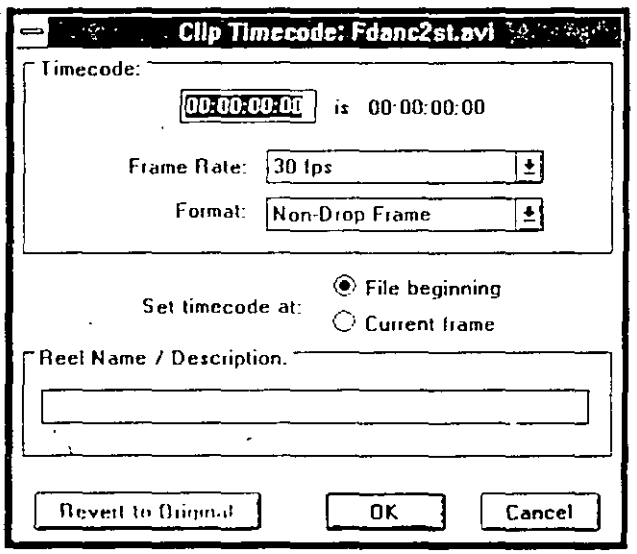
SETTING THE TIMECODE FOR CLIPS

You can assign the timecode for the starting point of a clip when the clip is digitized, or by using the Timecode command in the Clip menu. If you do not set the timecode for a clip, Adobe Premiere assumes a starting time of 00:00:00:00. For instructions on assigning the timecode while capturing video, see "Capturing Timecode" on page 245. For information on adjusting the timecode to match a window dub, see "Calibrating Timecode" on page 245.

To set the timecode for a clip:

1 Select a clip in the Clip, Project, or Construction window.

2 Choose Timecode from the Clip menu. The Clip Timecode dialog box appears.



3 Enter the following information for setting the timecode:

- Timecode. Enter the new starting time for the clip in SMPTE format. The current SMPTE timecode address for the starting time of the clip is displayed at the top of the dialog box.

- Frame Rate. Choose the frame rate at which you want the clip exported. (Frame rates of 24 fps or 25 fps do not support drop-frame timecode.)

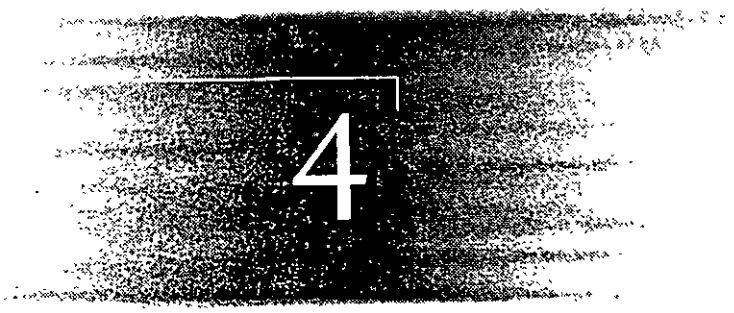
- Format. Choose drop-frame or nondrop-frame timecode. For more information on timecode, see "SMPTE Timecode" on page 284.

- Set Timecode At. This option is available only when setting the timecode from the Clip window. Choose File Beginning to assign the entered timecode address to the first frame in the source clip (the default setting). Choose Current Frame to assign the timecode address to the currently displayed frame in the Clip window.

- Reel Name/Description. Enter the reel name of the source tape on which the clip is located. Enter a description of the clip, if desired. Note that the number of characters you can enter in this field may be limited by the selected export module.
- Revert to Original. Clicking this option causes the clip to revert to its original timecode and name settings. If a clip is used more than once in a movie, this option affects all copies of the clip.

4 Click OK. If you selected multiple clips, the dialog box reappears for each clip.

Chapter



Chapter 4: Previewing a Movie

This chapter describes how to preview a project and how to set preview options. Previewing is a quick way to play part of a movie or an entire movie without having to compile the entire contents of the Construction window into a Video for Windows or QuickTime movie, which can take a substantial amount of time.

There are two types of previews: compiled and uncompiled. Compiled previews require processing time, but they give you an accurate preview of transitions and effects. Uncompiled previews don't require processing time but they may not provide adequate detail or accuracy. Adobe Premiere lets you mix these previewing modes. You can compile selected effects and transitions and preview both the compiled and uncompiled sections using the Controller.

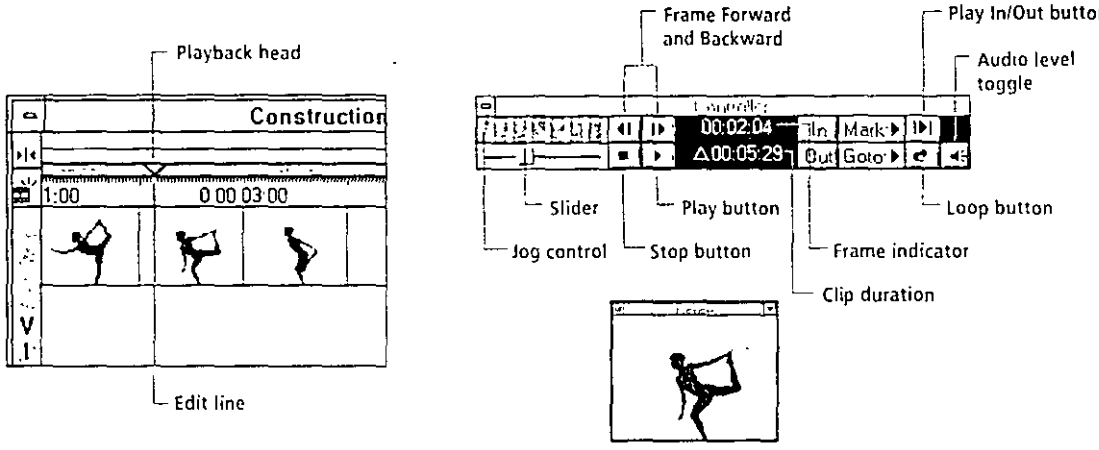
It's important to note that previews can be compiled differently than the final movie. Preview processing is faster when the frame rate is low and the frame size is small. However, many users choose to process previews using the final movie settings for size and frame rate. This saves processing time when the final movie is made because Adobe Premiere uses the previewed segments, saved as Preview files, when it compiles the final movie. For more information on previewing options, see "Setting Preview Processing Options" on page 125.

Previews normally play in the Preview window. You can also use the Print to Video command to view previews on an NTSC (National Television Standards Committee), PAL (Phase Alternation Line), or SECAM (Sequential Couleur Avec Mémoire) monitor or in the center of your computer screen with the remainder of the screen blacked out.

Note: *To preview a movie on an NTSC, PAL, or SECAM monitor, your computer must be able to produce the appropriate video signal.*

USING THE CONTROLLER

The Controller is used in conjunction with the Preview window to display the contents of the Construction window. The Controller controls the position of the playback head in the Construction window, which in turn determines the position of the edit line and the frame displayed in the Preview window.



Previewing with the Controller does not display transitions or other effects unless they have been previously compiled using the Preview or Snapshot commands. However, the Controller functions as a quick previewing tool because you're not compiling as you preview. The uncompiled segments are displayed with an X in the center of the frame for the duration of the effect or transition. For more information on compiling effects and transitions, see "Compiling Effects and Transitions" on page 121.

The Controller has the same controls as the Clip window. You can use the Controller to set markers in the time ruler of the Construction window that correspond to the frame displayed in the Preview window. You can also go directly to Construction window markers or SMPTE frames. For information on using markers, see "Setting Place Markers for Clip Alignment" on page 72.

To preview using the Controller:

1 Choose Controller from the Windows menu if the Controller is not already open.

2 Choose Preview from the Windows menu if the Preview window is not already displayed. The Preview window displays the frame of the movie that corresponds to the position of the playback head in the Construction window.

3 Drag the playback head in the Construction window to scrub through the movie, or use the Controller to preview specific frames:

- Use the Jog control to move the playback head forward or backward.

• Use the Frame Forward and Frame Backward buttons to preview the contents of the Construction window frame by frame.

• Press the Play button to play a sequence of frames starting from the playback head.

• Press the Play In/Out button to play the frames under the yellow work area bar. For information on adjusting the work area, see "Compiling Effects and Transitions" on page 121.

4 Use the Mark button to set markers in the time ruler of the Construction window. Use the Goto button to go to a marker in the Construction window.

Note: The Play button in the upper right corner of the Construction window has the same function as the Play button in the Controller.

Changing the Preview window display

The Control menu in the upper-left corner of the Preview window lets you resize the Preview window, change its resolution, and change the Preview window options. To resize the Preview window to many popular sizes, Shift+click any portion of the window.

To keep the Preview window on top of other windows while previewing or while scrubbing through the Construction window, choose Options from the Preview window Control menu, and in the Preview Window Settings dialog box, select the In Front When Previewing and the In Front When Scrubbing options.

COMPILING EFFECTS AND TRANSITIONS

When building a movie in the Construction window, you should compile effects and transitions so that they can be accurately previewed. A compiled movie segment is one that has been processed and saved to disk. You designate which effects and transitions you want compiled by adjusting the work area bar in the Construction window. Adobe Premiere normally saves compiled effects and transitions as temporary movie files. These files are used in subsequent previewing and, depending on your settings, can be used in the compilation of the final movie. The Construction window displays a thin gray bar above the timeline to indicate which effects and transitions have been compiled. For more information on previewing modes, see "Selecting a Previewing Mode" on page 128.

To compile a preview of the work area:

1 Use one of the following techniques to adjust the yellow work area bar so that it extends across the effects and transitions you want to compile:

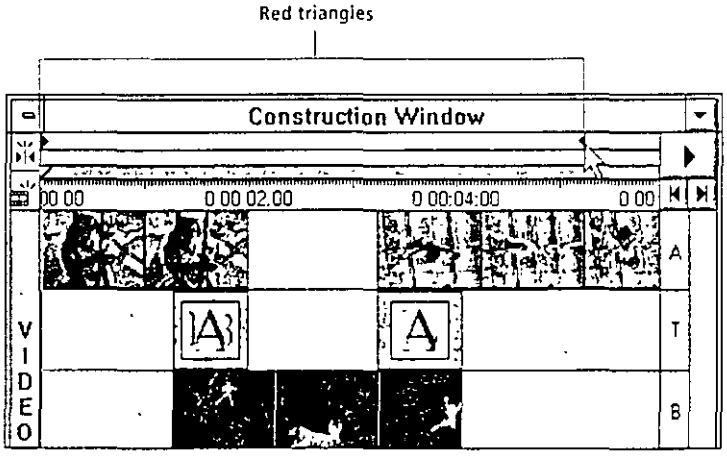
• Drag the red triangle at either end of the work area bar. You can also Ctrl+click above the time ruler to set the end point of the work area bar.

• Choose the in point and out point tools in the Construction window and click above the time ruler.

• Click the In and Out buttons in the Project controller to adjust the work area bar according to the position of the playback head.

• Double-click the work area bar to extend it to the width of the Construction window.

• Alt+click the work area bar to set the work area for a continuous region in the Construction window. A continuous region is useful for finding gaps in the movie construction. If no gaps exist, the work area will extend across the entire movie.



Dragging the red triangle to widen the work area bar

2 To set options for the processing size, previewing mode, and other previewing parameters, choose Preview Options from the Make menu. These options are initially set when you choose a preset for a project. In most cases you won't need to change them. The Preview command compiles a preview based on the settings in the Preview Options dialog box. For more information on preview options, see "Setting Preview Processing Options" on page 125.

3 Choose from several options to compile and view a preview of the work area:

• Choose Preview from the Project menu, or press Return. The work area is compiled and the preview plays automatically in the Preview window. To interrupt the preview, press the Esc key.

• Choose Snapshot from the Make menu. The work area is compiled, and the Controller comes forward for viewing the preview. With this method, the preview does not play automatically, but the Controller gives you more control over viewing than the Preview command.

Previewing by dragging through the time ruler

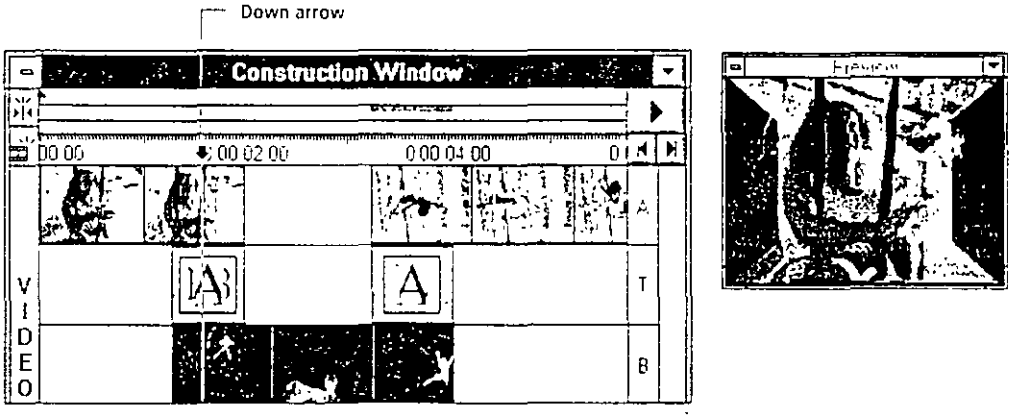
You can preview any area of your movie by dragging the pointer through the time ruler. This is different than scrubbing with the playback head because effects and transitions are processed as you drag. This type of previewing provides a quick way of checking superimpositions, motion settings, filters, or specific transitions from one clip to another. However, you aren't likely to get a good sense of your movie's pacing because you control the speed of dragging.

Processing takes place in real time as you drag, but the previews are not saved to disk as temporary files as they are when you use the Snapshot or Preview commands. Thus, you don't change any effects or transitions that have been compiled and saved to disk.

Note: By default, processing for this type of preview is based on the settings in the Preview Option dialog box. You can speed up the processing by reducing the Preview window size or by reducing the Preview window resolution to 1/4 or 1/2. Use the Preview window Control menu to change the window size or resolution. If the Preview options differ from the final output options, processing previews will be faster, but compiling the final movie will take longer.

To preview a movie by dragging in the time ruler:

1 Position the mouse pointer anywhere in the time ruler. The pointer changes into a down arrow.



2 Drag the arrow along the time ruler. The clips under the arrow play in the Preview window. You can drag to the left or to the right to make the preview play forward or backward.

PREVIEWING WITH PRINT TO VIDEO

You can use the Print to Video command to preview the contents of the Clip window. Using this command is similar to using the Preview command, except that the preview plays in an NTSC monitor or in the center of the screen instead of in the Preview window.

To play a movie directly from the Clip window:

1 Select the part of the Construction window you want to play by adjusting the yellow work area bar above the time ruler, and compile the work area.

2 Open the compiled movie in the Clip window.

3 Choose Export/Print to Video from the File menu. The Print to Video dialog box appears.

4 Select Print to Video options. (For a description of these options, see "Using Print to Video" on page 219.) Do not select the Activate Recording Deck option unless you want to record the preview onto a controllable recording device as it plays on the screen.

5 Click OK.

The preview plays in the center of the screen against a black background. To interrupt the playing of the preview, press the Esc key.

Note: *For best performance when playing a preview directly from the Clip window, you should preview in Effects to Disk mode. For more information, see "Selecting a Previewing Mode" on page 128.*

MAKING A PREVIEW MOVIE

When a movie contains a number of complex transitions, special effects, filters, or audio clips requiring precise synchronization, previewing with the Preview command or by dragging in the time ruler may take too long or may not be accurate enough. Alternatively, you can make a preview movie by compiling the clips under the work area bar into a Video for Windows or QuickTime movie. Unlike normal previews, preview movies are not linked to the Construction window through the Controller, but can be left on the screen or saved for later viewing.

Preview movies are built using the options specified in the Project Output Options dialog box. To build your preview movie more quickly, set a smaller size and lower frame rate than for your final movie. A size of 160-by-120 pixels and a frame rate of 15 fps are recommended. If you plan to make multiple preview movies for the project, consider creating a preset that you can load before building the previews. You can then reload the original preset before building the final movie.

To make a preview movie:

1 Position the work area bar over the clips you want to preview. (See step 1 in the section "Compiling Effects and Transitions" on page 121.)

2 Choose Make Movie from the Make menu. The Make Movie dialog box appears.

3 Click Output Options. The Project Output Options dialog box appears.

4 Choose Work Area from the Output drop-down list.

5 Select any other output options desired. For more information on output options, see "Selecting Project Output Options" on page 205.

6 Click OK. The Project Output Options dialog box closes and the Make Movie dialog box reappears.

7 Enter a name for the preview movie and click OK.

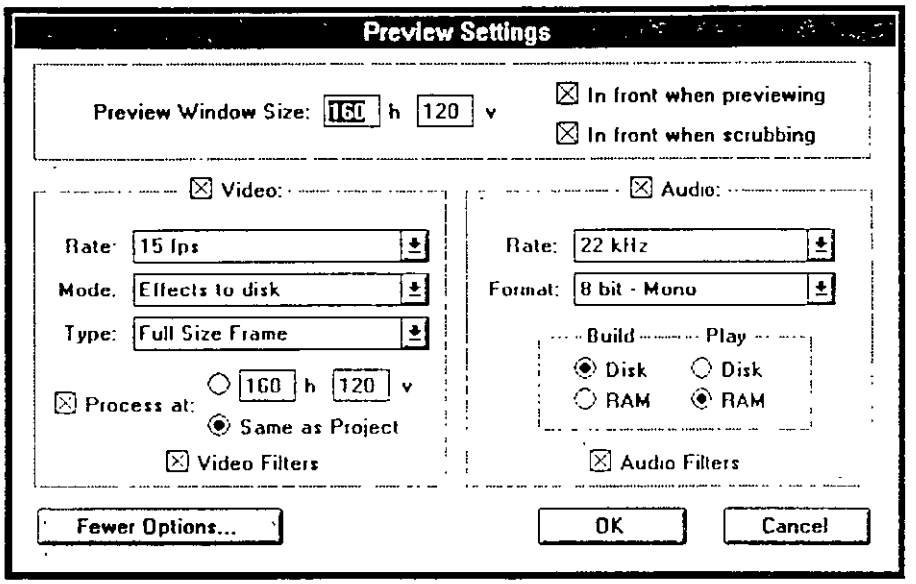
Adobe Premiere builds and saves the movie, and then opens it in a Clip window. Click the Play button to view the preview movie.

SETTING PREVIEW PROCESSING OPTIONS

Preview options affect the way the preview is processed when you choose the Preview or Snapshot commands. Choosing a project preset initially sets the preview options. In most cases you won't need to change them. You can, however, customize or create new Adobe Premiere presets to include your preferred preview settings. For more information on creating or changing presets, see "Loading or Modifying Project Presets" on page 29.

To change preview options:

1 Choose Preview Options from the Make menu, or double-click the Preview window. The Preview Options dialog box appears.



2 To change the Preview window, set the following options:

• Preview Window Size. Enter the desired preview image size (in pixels). Adobe Premiere processes the preview at this size unless you specify a different size using the Process At option in the video portion of the dialog box, as described in step 3. Keep in mind that enlarging the Preview window may degrade the preview if you are previewing from RAM or if your hardware cannot process the larger images fast enough.

Enter a value in either the width or the height field to automatically calculate and update the other field based on the aspect ratio set in the Project Output Options dialog box. For example, if the 4:3 Aspect Ratio option is selected in the Project Output Options dialog box, a 4 to 3 width-to-height ratio is maintained.

Note: *You can also resize the Preview window by choosing a size from the window's Control menu, or by dragging any corner of the window. You can automatically resize the window to many popular sizes by Shift+clicking any portion of the Preview window, or by holding down the Shift key while dragging any corner of the window.*

3 To change the video preview options, set the following options (if all options do not appear, click More Options):

• Rate. Select a rate from 1 fps to 30 fps to specify the speed at which the preview plays. Many computers are limited to maximum frame rates below 30 fps.

• Mode. Select a new mode if you want to optimize how the preview is built and stored. For a discussion of previewing modes, see "Selecting a Previewing Mode" on page 128.

• Type. Match this setting to the way your video display board processes NTSC or PAL video if you are previewing in Effects to Disk mode and you intend to output to videotape at full-frame NTSC or PAL. Otherwise, leave the setting at Full Size Frame. For full-frame video, many boards process only half the lines in a frame and double the captured lines to complete the frame. To find out how your board processes video, see the documentation that comes with your board. For general information on video boards, see "Digitizing Hardware" on page 227.

• Process At. Click this option to define the processing resolution of the preview, regardless of the Preview window size. This option is automatically turned on when you enter new values for the horizontal and vertical dimensions. Processing at a smaller size will build previews faster, but at degraded quality. If you are previewing in Effects to Disk mode, you should consider processing your previews at the same size at which you output your movie. This saves you processing time when the Print to Video command is selected. For a discussion of how previews are processed, see "Selecting a Previewing Mode" on page 128.

• Video Filters. Deselect this option to turn off the application of filters (the default during previewing) to enhance performance.

4 Set the following audio options (if all options do not appear, click More Options):

• Rate. Enter a sampling rate for the audio clips. You can choose a rate of 11, 22, or 44 kilohertz (kHz). With higher sampling rates, the sound in the audio track will be cleaner. CD quality audio is sampled at 44 kHz with 16-bit resolution.

• Format. Choose between mono and stereo, and between 8-bit and 16-bit for the audio processed in the preview. If your source clips contain 8-bit audio, setting the Format to 16-bit audio will only increase the time and disk space required for previewing without improving the audio.

• Build/Play. Click a button to specify how the audio preview will be built and then played. For more information on previewing modes, see the next section, "Selecting a Previewing Mode."

• Audio Filters. Deselect this option to turn off the use of audio filters (the default) during previewing.

Selecting a previewing mode

You can specify whether the program builds a preview using available RAM, hard disk space, or both. Specifying the processing mode lets you optimize previewing for your hardware setup and for the desired accuracy. The processing mode affects the time required to build the preview and to compile the finished movie using the Make Movie command.

Processing a preview works best when you save the compiled movie segments to your hard disk in Effects to Disk mode. This is the best previewing mode for most projects. In fact, all project Presets shipped with Adobe Premiere set the previewing mode to Effects to Disk.

Modes for previewing video

Filters, transitions, and superimpositions (collectively referred to here as *effects*) must be processed before they can be previewed accurately. You can process the effects while the movie previews (which requires a lot of RAM), or you can have Adobe Premiere process the effects and save them to disk before playing back the preview. If your movie contains no effects, then you can have Adobe Premiere cache the edits into RAM and play the preview at the full frame rate of your machine.

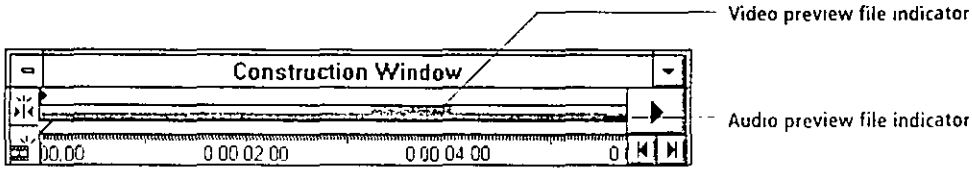
In the Preview Options dialog box, select from the following video previewing modes:

- Effects to Disk. Select this mode to have Adobe Premiere process all effects in the work area and save the information on the hard disk before playing back the preview. In this mode, the program processes the effects before the movie is played back. This frees up memory for loading and playing movie frames that would otherwise be required for processing during playback, and lets you preview long movies smoothly and accurately.

In Effects to Disk mode, Adobe Premiere creates temporary preview files (*.tmp*) for each effects segment in the Construction window, such as a transition or a title overlay. These files are automatically stored in a directory with a *.tmp* file extension, located in the directory and disk volume that contains your project.

Adobe Premiere uses the temporary preview files for subsequent previewing. Only those sections of the Construction window that have changed since the last preview require reprocessing. The program also uses preview files when compiling the final movie (using the Make Movie or the Print to Video command) if the image dimensions and compression settings match those in the Output Options and Preview Options dialog boxes. This reduces movie compilation time considerably.

Adobe Premiere displays thin gray bars above the time ruler in the Construction window to indicate which portions of the window have been processed and saved to disk as preview files. The upper half of the gray bar represents video preview files, while the lower half represents audio preview files.



Changing any variable in a transition, filter, or superimposed clip causes the program to delete any associated preview files. Such variables include the duration of the transition or effect, the fade levels, the key type, and the motion settings. If you change the Rate, Type, or Process At options in the Preview Options dialog box, Adobe Premiere will delete and reprocess all previously built preview files.

Note: *To ensure smooth previews in the Effects to Disk mode, make sure that the dimensions of your original clips match the setting of the Process At option in the Preview Options dialog box. If the dimensions do not match, Adobe Premiere must resize the clips while it plays the preview, which may result in stuttering.*

• Effects to RAM. In this mode, the video clips are loaded into RAM, and then the effects are processed in real time as the preview plays. This method is useful if you are previewing short segments or you have lots of RAM. It is also useful when you are experimenting with different transitions. However, Effects to RAM may not give accurate results, as some transitions and effects cannot be processed in real time, resulting in dropped frames in the preview.

Processing previews in Effects to RAM mode can be especially helpful when working with clips that have large dimensions (larger than 640-by-480 pixels). Building filters and transitions for these clips can take considerable time. To create the best RAM-based previews, set the Rate option to less than 30 fps and reduce the size of the Preview window so that more frames can be loaded into RAM. Once the frames are loaded, effects and filters can be applied to the frames with almost no preview delay.

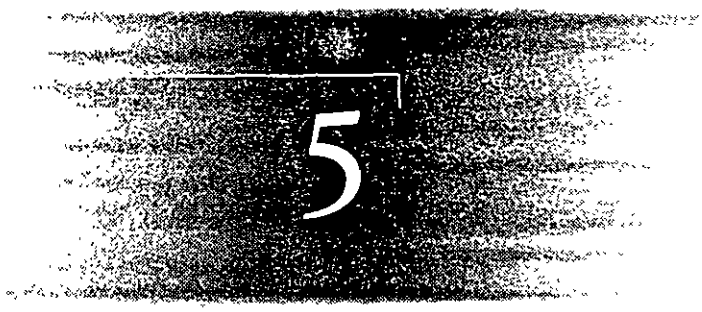
• Play Directly. In this mode, there is no pre-loading of video clips. Effects are processed as the preview plays. This method generally provides accurate previews only if you have a very fast computer and plenty of RAM, or if you don't have effects in your movie.

Modes for previewing audio

In the Preview Options dialog box you can choose from three options for processing audio previews:

- Build to Disk/Play from Disk. In this mode, all audio is processed, saved to the hard disk, and then played back from disk. This is the best mode for working with projects that contain only audio. If your project also contains video, you need a very fast disk drive with this option to prevent video from degrading. Video degradation is caused by the disk drive searching for and playing back two files (audio and video) at the same time.
- Build to Disk/Play from RAM. In this mode, all audio is processed and saved to the hard disk, but instead of being played from the disk, it is moved into a RAM buffer. This option allows video to preview more smoothly, but may impose some restrictions based on the amount of RAM installed in your system. As a general guideline, 1 minute of audio sampled at 22 kHz (mono) requires 1.3 MB of free RAM.
- Build to RAM/Play from RAM. In this mode, all audio is processed directly in RAM and then played from RAM. Since nothing is saved to disk, the audio must be reprocessed when you compile a movie or output a movie to videotape. This option has the same RAM requirements for playing audio as the preceding option and works best when you are previewing only audio mixes.

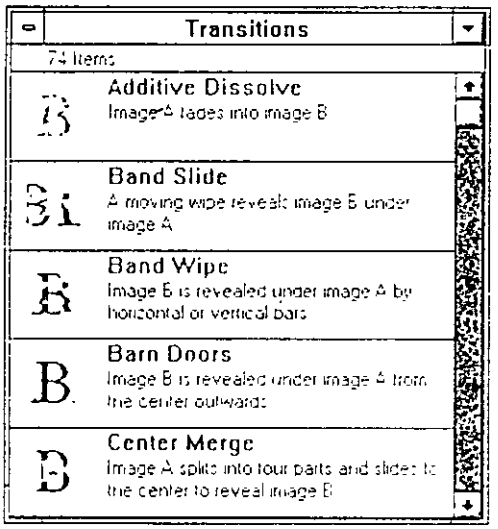
Chapter



Chapter 5: Using Transitions

This chapter describes how to create eye-catching transitions between movie or still-image clips in Adobe Premiere. Each transition is unique and has a variety of options for controlling the way the image is transformed. The most common transition between clips is a *cut*—an instantaneous switch from one clip to another. The term is borrowed from film editing, where a cut is achieved by splicing two shots together. To cut between clips in Adobe Premiere, you simply arrange the clips, head to tail, on the same track in the Construction window. If, however, you want a less abrupt or more elaborate transition between clips, you have many options from which to choose.

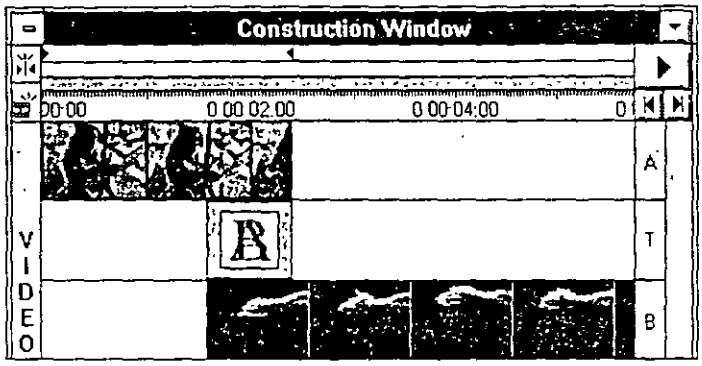
Adobe Premiere includes more than 70 transitions such as Additive Dissolve, Band Wipe, Checkerboard, Slide, and Venetian Blinds. In addition, you can create your own custom transitions, which you can save and use over again. The Transitions window includes a brief description of each transition, and when the window is active, the transition icons become animated.



Note: If you plan to generate an Edit Decision List (EDL) for your movie, see "Generating an Edit Decision List" on page 108 for a description of how transitions in Adobe Premiere are interpreted by the EDL export modules.

ADDING TRANSITIONS

When you create a transition between clips, you must place one clip on video track A in the Construction window and the other on video track B. The transition goes on the T track, which is located between video tracks A and B. The clips on tracks A and B should overlap in time so that the transition can be placed in the overlapping area.



You control the direction of the transition—from track A to track B, or from track B to track A— by the position of the clips on the tracks. By default, when two clips start at the same time, the transition moves from track A to track B; when two clips start at different times, the transition starts with the clip that plays first (the leftmost clip on the timeline). You can override the default direction by clicking the transition's track selector. For information on toggling the track selector, see the next section, "Changing Transition Settings."

To add a transition to the Construction window:

1 If the Transitions window is not visible, choose Transitions from the Windows menu.

2 Drag the transition you want to use from the Transitions window to the T track in the Construction window.

If clips on video tracks A and B overlap, Adobe Premiere adjusts the transition to fit the overlapping area. You can shorten or lengthen its playing time just as you would a clip.

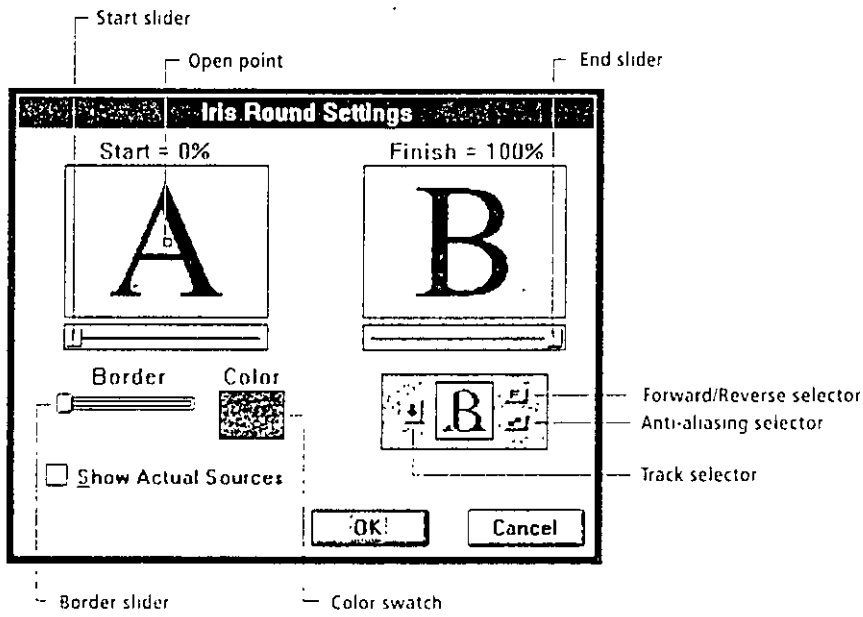
3 To replace a transition with another transition, use the Copy and the Paste to Fit commands in the Edit menu. The Paste to Fit command lets you paste a transition of the same size into the area of the previous transition.

CHANGING TRANSITION SETTINGS

Transitions have various settings, all of which can be adjusted using the Transition Settings dialog box. In addition, you can access the most frequently used settings by clicking controls in the transition's thumbnail in the Construction window. These controls include the Track selector, the Forward/Reverse selector, the Edge selectors (which are optional, depending on the type of transition), and the Anti-aliasing selector. You may not be able to see the controls if the thumbnail in the Construction window is too short or too small.

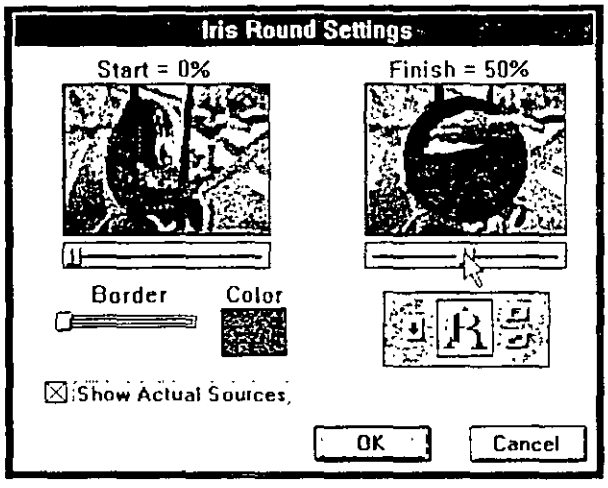
To change transition settings:

1 Select the transition and choose Transition Settings from the Clip menu, or double-click the transition in the Construction window. The Transition Settings dialog box appears with a thumbnail of the transition displayed in the lower-right corner.

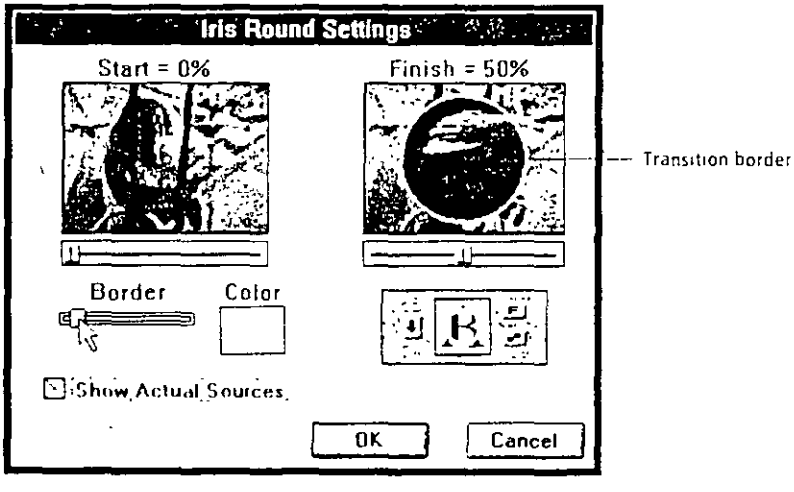


2 To see the starting and ending frames of the transition in the boxes provided, select Show Actual Sources.

3 To change the starting and ending points of the transition, use the Start and End sliders. Hold down the Shift key to simultaneously lock and move the start and end sliders. For example, you might use this option to start or end the transition in the middle of the effect.

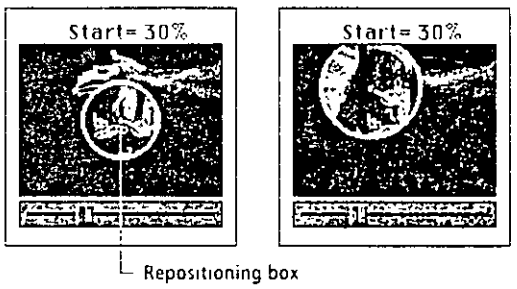


4 To adjust the width of the optional border on the transition, drag the Border slider. The default Border is None.



5 To select a border color, click the color swatch and use the color picker to select a color. For more information on using the color picker, see "Using the Premiere Color Picker" on page 141.

6 To change the starting position of the Iris Cross, Iris Diamond, Iris Round, Iris Square, Iris Star, and Zoom transitions, position the pointer on the small, white, repositioning box in the Start window of the Transition Settings dialog box, and drag to reposition the starting point.

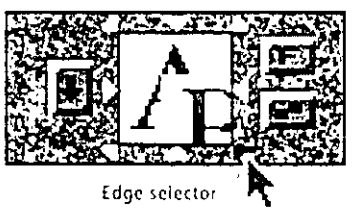


7 To display any custom settings for the transition, click Custom. For example, you use custom settings to set the number of bands used in the Band Slide transition. Custom settings are not available for all transitions.

8 To change the direction of the transition between clips, click the Track selector on the left side of the transition's thumbnail. The direction can be either down (from track A to track B) or up (from track B to track A). You can also set this option from the transition's thumbnail in the Construction window if the thumbnail is large enough.

9 To change the orientation of the transition, click an Edge selector on the transition's thumbnail. The Edge selectors are small triangles bordering the transition icon.

For example, the Barn Doors transition can be oriented vertically or horizontally. Some transitions do not have Edge selectors because the transition has only one orientation.



10 To make the transition play forward or backward, click the Forward/Reverse selector in the upper-right corner of the transition's thumbnail. For example, the Clock Wipe transition can play clockwise or counterclockwise. You can also set the forward or reverse direction from the transition's thumbnail in the Construction window.

11 To adjust the smoothness of the transition's edges, click the Anti-aliasing selector in tl lower-right corner of the transition's thumbnail. Clicking cycles through the values Low, High, and Off.

The diagonal line on the selector becomes progressively more or less jagged to indicate its value. Anti-aliasing smooths the frames affected by the transition by replacing jagged edges between the images with dithered patterns. This makes the transition appear less abrupt. You can also set anti-aliasing from the transition's thumbnail in the Construction window.

Anti-aliasing set to Off

Anti-aliasing set to High

12 Click OK. If you selected multiple transitions, the Transition Settings dialog box reappears for each transition.

CREATING AN IMAGE MASK TRANSITION

You can use a black-and-white bitmap image as a transition mask in which image A replaces the black in the mask, and image B replaces the white in the mask. If you use a grayscale image for the mask, pixels containing 50 percent or more gray will be converted to black, and pixels containing less than 50-percent gray will be converted to white.

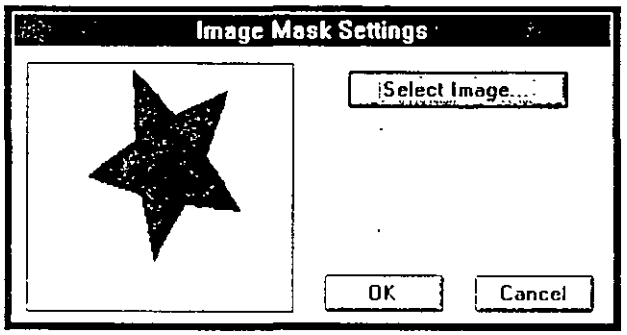
For a more versatile mask, use the Track Matte key type to create a matte from the clip on the next S track; for more information, see "Track Matte" on page 186. For an example of using the Track Matte key type to create a moving matte, see "Playing a movie through a traveling matte" on page 262.

To add an image mask as a transition:

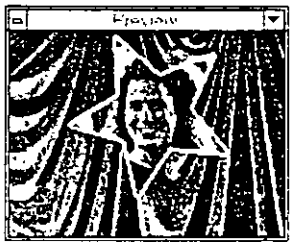
1 Drag the Image Mask transition from the Transitions window to the T track of the Construction window. The Image Mask Settings dialog box appears.

2 Click Select Image. The Open dialog box appears.

3 Select the image file you want to use as a transition mask, and click OK. The image you selected appears in the Image Mask Settings dialog box.



Bitmap image



Result of image mask on movie clip

4 Click OK.

CREATING A GRADIENT WIPE TRANSITION

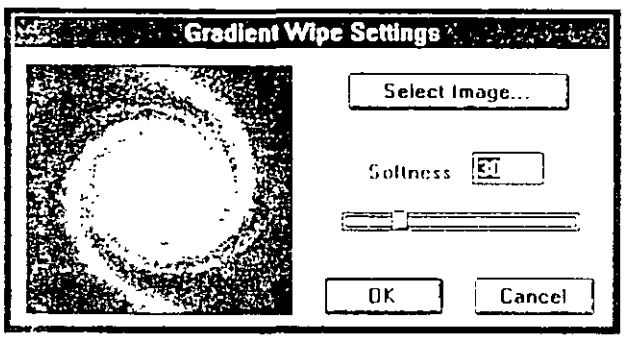
Adobe Premiere can use any importable grayscale image as a gradient wipe. In a gradient wipe, image B fills the black area of the grayscale image and then shows through each level of gray as the transition progresses until the white area becomes transparent. When you create a Gradient Wipe transition, you can specify the "softness" of the transition's edges.

The Adobe Premiere program includes sample images that you can use as Gradient Wipe transitions. These samples are located in the Adobe Premiere *3d_party* directory. You can also create your own Gradient Wipe images in the Adobe Photoshop program.

To create a Gradient Wipe transition:

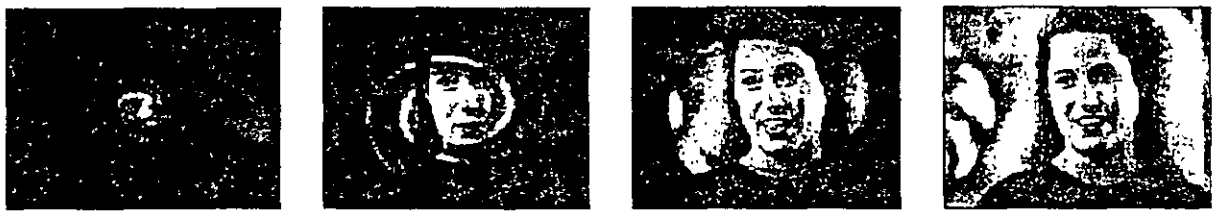
1 Drag the Gradient Wipe transition from the Transitions window to the T track of the Construction window. The Gradient Wipe Settings dialog box appears.

2 Click Select Image, and use the Open dialog box to select the file you want to use in the wipe. The image you select appears in the Gradient Wipe Setting dialog box.



3 Adjust the softness of the transition's edges by dragging the Softness slider. As you drag the slider to the right, image A increasingly shows through image B.

4 Click OK.



Result of Gradient Wipe transition mask on movie clip

CREATING CUSTOM TRANSITIONS

In addition to the many transitions included with Adobe Premiere, you can apply your own custom transitions using the Transition Factory. You determine how you want the transition to affect the channels (alpha, red, green, and blue) of each pixel in the first image and the second image by specifying arithmetic expressions.

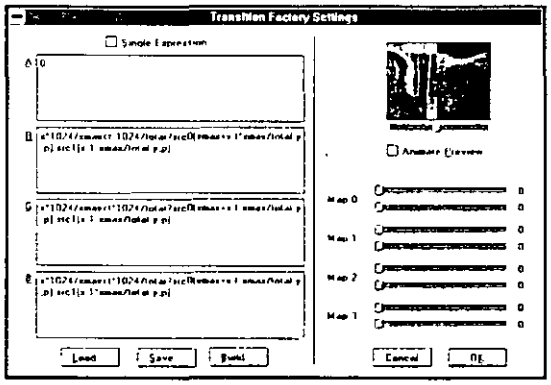
The transitions you create can also include Settings dialog boxes. The Settings dialog box provides up to eight sliders for adjusting the transition's effect. When you design a transition, you include user-supplied slider information in the expression. You also determine the number of sliders and whether they will appear in the Settings dialog box individually or in pairs.

When you create a transition, you can save its expressions in a text file. Doing so lets you use the Transition Factory to edit the transition later. You can also add your custom transition as a built-in transition to Adobe Premiere so that it appears in the Transition window.

The next two procedures explain how to use the Transition Factory to apply and save custom transitions for use in Adobe Premiere. For a complete discussion of using arithmetic expressions to achieve an effect, see Appendix B, "Expressions for Creating Transitions and Filters." The expressions described in Appendix B are used by both the Transition Factory and the Filter Factory.

To create a custom transition:

1 Drag the Transition Factory transition from the Transition window to the T track of the Construction window. The Transition Factory Settings dialog box appears.



2 Specify the expressions as follows:

• To specify an expression in the alpha channel, select Single Expression and type the expression in the A field. The evaluation of the alpha channel expression will be applied to each of the other three channels: R, G, and B. When the same value is applied to each channel of the pixels in an image, the image will be a grayscale image.

• To specify separate expressions for the R, G, and B channels, make sure that the Single Expression option is deselected and type the expressions in the R, G, and B fields. Even if you specify the same expression in all three channels, their evaluations will probably be different.

As you type an expression, a small yellow caution sign appears. It will remain visible until you have typed a legal expression. If the caution sign does not disappear, it means that there is an error in the expression. To see which part of the expression is in error, click the caution sign to select the incorrect portion.

3 If the expressions include user-supplied slider information, drag the appropriate Map sliders to preview the effects. The Map 0 sliders correspond to sliders 0 and 1; the Map 1 sliders correspond to sliders 2 and 3; and so on. For information on including user-supplied slider information in expressions, see "Providing User-Controlled Sliders" on page 293.

4 When you have correctly set up the transition, click Save to save the expressions in a text file. Saving the expression allows you to load and edit the transition in the future. You should give the text file the same name that you plan to give the transition, but save it in a directory other than the Adobe Premiere *plugins* directory.

5 If you want to use this one instance of the transition only, click OK to apply the transition. If you want to use the transition more than once, see the next procedure.

To save a custom transition for additional use:

1 Follow steps 1 through 4 of the previous procedure, "To create a custom transition."

2 Click Build. The Build Custom Transition dialog box appears.

3 Specify a unique module name with 8 characters or less in the DLL Module Name field.

4 Specify a name for the transition in the Title field. The title will appear in the Transition window after you restart Adobe Premiere.

5 Use the Author field to include credits or copyright information in the transition's Settings dialog box; delete any information you do not want.

6 Use the Description field to include a description of the transition. The description will appear in the Transition window after you restart Adobe Premiere.

7 If the transition's expressions include user-supplied slider information, select the appropriate number of Slider or Map options and specify labels for the sliders in the corresponding text boxes. The labels will appear with the sliders in the transition's Settings dialog box.

To display the sliders individually in the Settings dialog box, use the Slider options. To display the sliders in pairs, use the Map options. Whether you should use individual or paired sliders depends on the type of transition you are creating.

8 Click OK. The custom transition module is saved in the Adobe Premiere *plugins* directory with the module name you specified and the *.prm* file extension.

9 To make the transition available to users, restart the Adobe Premiere program.

To edit a custom transition:

1 Drag the Transition Factory transition from the Transition window to the T track of the Construction window. The Transition Factory Settings dialog box appears.

2 Click Load. Use the Open dialog box to load the text file containing the transition's expressions. You must have saved the expressions in a text file when you created the transition to be able to edit it.

3 Follow the steps in the previous two procedures to edit and rebuild the transition.

USING THE PREMIERE COLOR PICKER

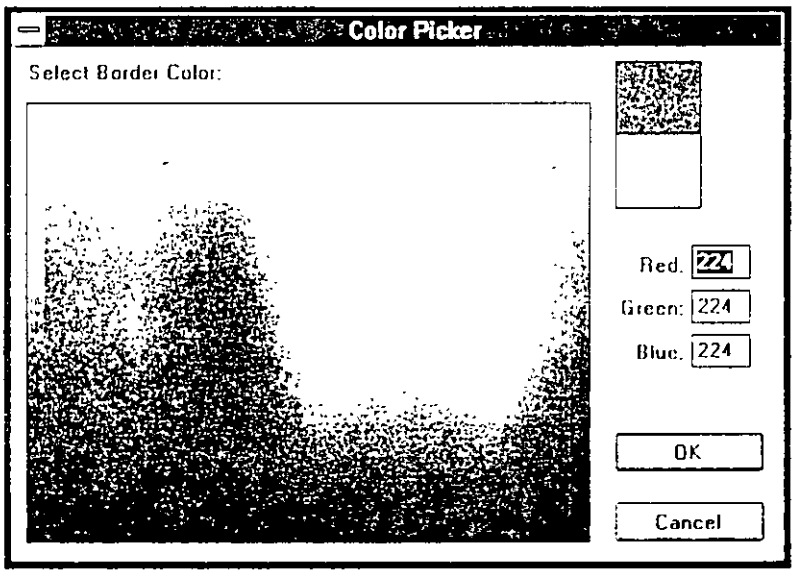
The Premiere color picker appears when you select a color for a transition's border, for a superimposition key, for titles and graphics, and for some filters. The Premiere color picker lets you visually select colors from the range of colors that can be displayed in a 24-bit color space. You can choose from the colors displayed in the Color Picker dialog box or you can enter RGB color values.

To select a color using the Premiere color picker:

1 Select a color using one of the following methods:

• In the Premiere Color Picker dialog box, move the cursor (shaped as a circle) to the desired color at any point on the screen, and click to select the color. Select a shade of gray by clicking the continuous gray scale located along the left edge of the window.

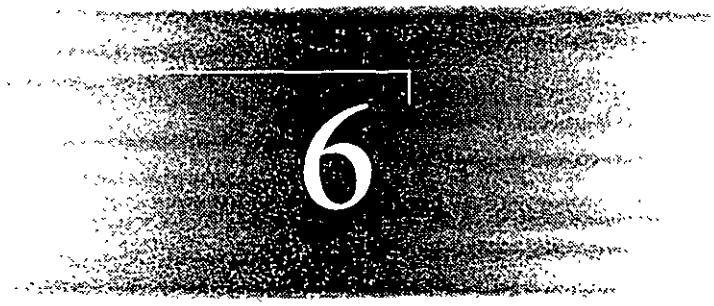
• Specify a color by entering the RGB components of the color in the Red, Green, and Blue text boxes. Enter a number between 0 and 255 for each component.



The selected color appears in the upper-right corner of the Color Picker dialog box, below a previously selected color. If the color you have chosen falls outside the NTSC color space, a warning sign will appear next to the swatch along with a smaller swatch that contains the NTSC-safe approximation of the selected color. Click the small swatch to substitute the NTSC-safe color for the chosen color.

2 Click OK, or press Return to apply the color.

Chapter



Chapter 6: Using Filters and Motion Settings

Adobe Premiere includes a variety of filters that let you distort, blur, sharpen, smooth, texture, and color images. There are also a number of special-purpose filters, such as the Image Pan filter for panning and zooming in an image that is larger than the output frame size, and the Vertical and Horizontal Flip filters for flipping the image along either axis. Audio filters include the Echo filter, which produces an echo effect, and the Fill Left and Fill Right filters, which affect the spatial quality of the sound. In addition, you can apply your own custom filters, which you can save and use over again.

Adobe Premiere also lets you create motion effects in movie and still-image clips that are similar to those achieved using an animation camera, such as zooming into an area of the clip.

APPLYING FILTERS

This section describes how to apply filters and filter settings to clips, and how to determine quickly which filters and filter settings have been applied to a clip. For examples of how filters affect clips, see "Effects of Various Filters" on page 163.

Adobe Premiere provides more than 70 movie and still-image filters and 5 audio filters, which are described in "Movie and Still-Image Filters" on page 147 and "Audio Filters" on page 163. In addition, Adobe Premiere works with third-party filters in the standard Adobe Premiere and Adobe Photoshop formats. Some filters can be applied to a clip over time. For example, you can apply brightness that gets progressively brighter as the clip plays.

Note: *If you have combined the* plugins *directories from Adobe Premiere and Adobe Photoshop, some of the Adobe Photoshop filters, though accessible, are not appropriate for use in Adobe Premiere.*

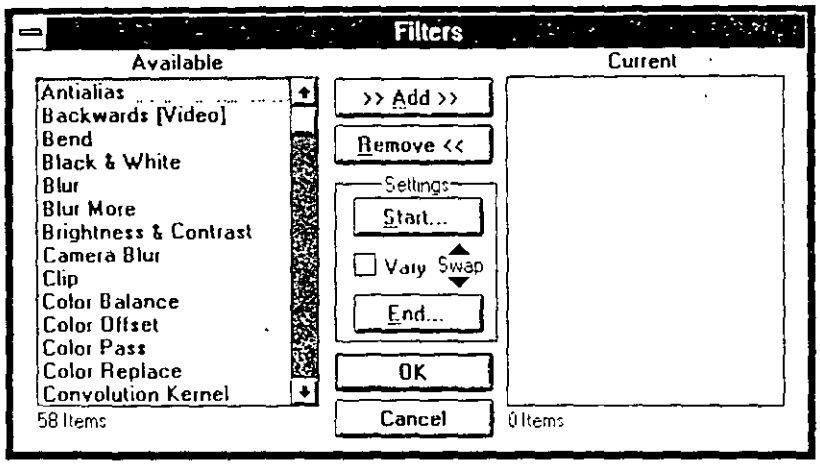
Applying filters to a clip

You can apply a filter to more than one clip at a time, and you can apply more than one filter to a clip.

To apply a filter to a clip:

1 Select the clip in the Construction window. To apply a filter to more than one clip, use the range select tool to select the clips. You could also select one clip and use the Paste Custom command later to apply the filter to a number of clips in sequence.

2 Choose Filters from the Clip menu. The Filters dialog box appears.

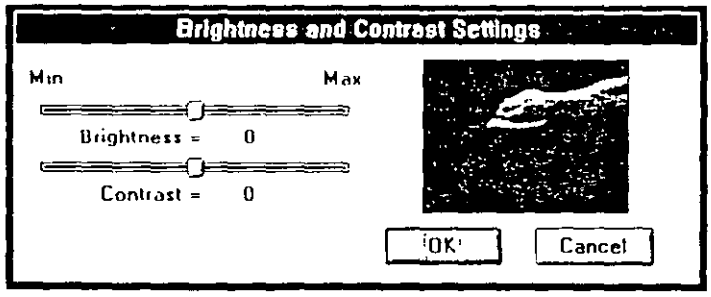


If you have selected a movie or still-image clip, the Filters dialog box displays only those filters that can be applied to movie or still-image clips; if you have selected an audio clip, the Filters dialog box displays only the audio filters.

3 Select the filter from the Available list and click Add, or double-click the filter in the Available list.

Note: *You can also apply a filter to a clip by positioning the pointer over the clip and clicking the right mouse button to access the Construction window pop-up menu. Click the left mouse button on Filters to open the Filters dialog box.*

4 If the filter has settings, a Settings dialog box appears. Adjust the settings as desired, and click OK. You can change a filter's settings at any time by double-clicking the filter in the Current list.



5 To apply additional filters to the clip, repeat steps 3 and 4. You can also apply the same filter to a clip several times to intensify (double, triple, etc.) the effect of the filter on the clip.

Adobe Premiere applies filters in the order in which they appear in the Current list in the Filters dialog box; if you want the filters applied in a different order, rearrange the filters in the Current list by dragging them up or down.

6 To remove a filter from the Current list, select the filter and click Remove or press Delete

7 Click OK to apply the filters.

In the Construction window, clips with filters applied to them are displayed with a blue border at the top.

Note: A filter is applied to an entire clip at a time. If you want to apply a filter to only part of a clip, you must split the clip using the razor tool. For more information on splitting clips in the Construction window, see "Splitting Clips" on page 89.

Changing filters over time

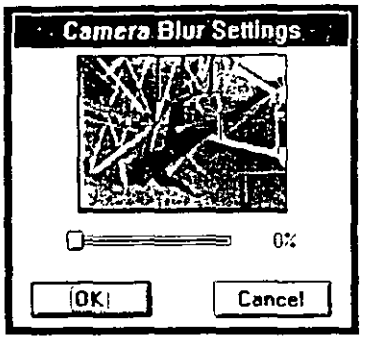
You can apply any filter that lets you specify settings to clips over time. For example, you can apply the Camera Blur filter in such a way that the clip is progressively distorted as it plays. Any Adobe Photoshop filter that has settings, such as the Tiles filter, can also be applied over time.

Tiles filter applied over time

To apply a filter to a clip over time:

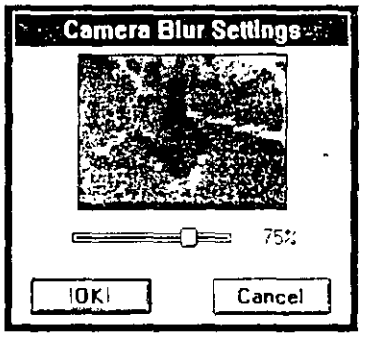
1 Follow the basic procedure described in the previous section, "Applying filters to a clip," to apply the filter. When the Settings dialog box first appears, click OK to return to the Filters dialog box. The options in the Settings area of the Filters dialog box become available.

2 Click Start. The filter's Settings dialog box reappears.



3 Adjust the settings as desired for the beginning of the clip, and click OK.

4 Click End in the Filters dialog box. The Settings dialog box appears again.



5 Adjust the settings as desired for the end of the clip, and click OK. The Vary option in the Filters dialog box is now selected to indicate that you have varied the filter over time.

6 To exchange the Start and End settings, click Swap.

7 To cancel the time effect and use the Start settings for the entire clip, deselect the Vary option.

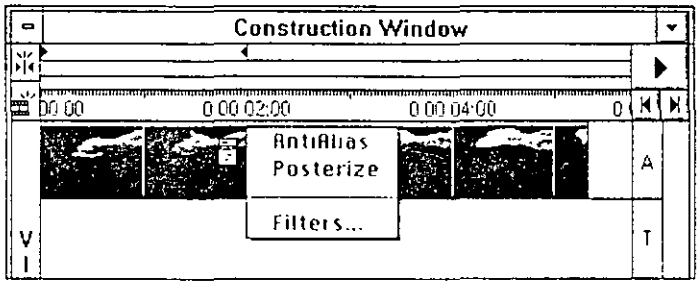
Determining which filters have been applied to a clip

In the Construction window, clips that have filters applied to them appear with a blue border at the top. You can quickly view a list of the applied filters for a selected clip and then change filter settings.

To determine which filters and filter options have been applied to a clip:

1 While pressing the Alt key, move the pointer over a clip in the Construction window. The pointer changes to an icon of a miniature menu.

2 Hold down the left mouse button to display a pop-up menu of filters that have been applied to the clip.



3 To view or change filter settings set for a clip, select the filter name from the pop-up menu. You can also apply additional filters by choosing Filters from the pop-up menu.

MOVIE AND STILL-IMAGE FILTERS

Adobe Premiere includes the following filters that can be applied to movie and still-image clips. For samples of many of these filters, see "Effects of Various Filters" on page 163.

Anti-alias

The Anti-alias filter smooths an entire image by averaging the colors in areas of high contrast. Averaging colors adds intermediate shades that make transitions between dark and light areas appear more gradual.

Backwards (Video)

The Backwards (Video) filter plays a clip from the last frame to the first frame. An alternate way to play a clip backwards is to set a negative speed for the clip. For information on setting clip speed, see "Setting the Forward or Backward Speed of a Clip" on page 95.

Bend

The Bend filter bends an image by stretching it horizontally and vertically. You can select a sine, circle, triangle, or square for the wave type, and adjust the intensity, rate, and width of the wave shape using the sliders in the filter's dialog box. You can also indicate the direction in which the wave should move. Choose Left, Right, In, or Out for the horizontal direction. Choose Up, Down, In, or Out for the vertical direction.

Black & White

The Black & White filter reduces all colors to shades of gray.

Blur and Blur More

These filters eliminate noise in the parts of the image where significant color transitions occur. The Blur filter has a subtle effect, suitable for high-resolution images. The Blur More filter produces an effect three to four times stronger than the Blur filter and is more suitable for lower-resolution images.

Brightness & Contrast

The Brightness & Contrast filter adjusts the brightness and contrast of the image. As you drag the sliders in the filter's dialog box, the preview of the image changes to reflect your adjustments.

Camera Blur

The Camera Blur filter simulates an unfocused camera lens by creating an extreme blur effect. By applying the effect to either the starting or ending frame of a clip, you can simulate the image going in or out of focus.

Clip

The Clip filter trims rows of pixels off the edges of a clip. This can be useful for trimming away noise and pixel skew that may result from overscanning during digitizing. Use the slider controls to crop each edge of the image separately. You have the option of clipping in pixels or image percentage.

If you want Adobe Premiere to automatically resize the trimmed clip to its original dimensions, use the Crop filter (described on page 151) instead of the Clip filter.

Color Balance

The Color Balance filter changes colors in the image by adjusting the RGB levels. Drag the sliders in the filter's dialog box to make a color more or less prominent. As you drag the sliders, the preview of the image in the dialog box changes to reflect your adjustments.

Color Offset

The Color Offset filter shifts the red, green, or blue channel of your image in one direction without moving the other two channels.

Note: *When creating a movie to be viewed through 3D glasses (one red lens and one blue lens), shifting the red channel to the left makes the image drop back, while shifting the red channel to the right brings the image forward. Small shifts are usually sufficient for considerable three-dimensional effects.*

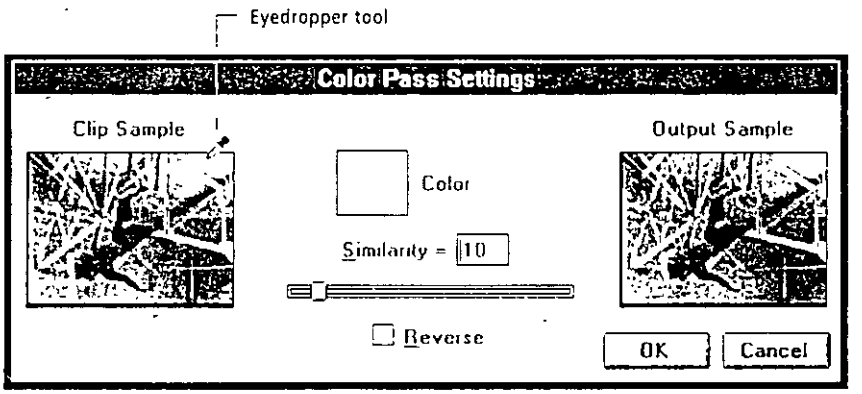
Color Pass

The Color Pass filter changes all colors in an image, with the exception of a single color, to black and white.

To specify the Color Pass settings:

1 In the Color Pass Settings dialog box, select the color that won't be converted to black or white by clicking the color in the Clip Sample box, or by clicking the color swatch to display the color picker and select a color. (For a description of the color picker, see "Using the Premiere Color Picker" on page 141.)

2 Drag the Similarity slider to select colors similar to the swatch color. Click Reverse to change only the selected color to black and white.



3 Click OK to apply the filter settings.

Color Replace

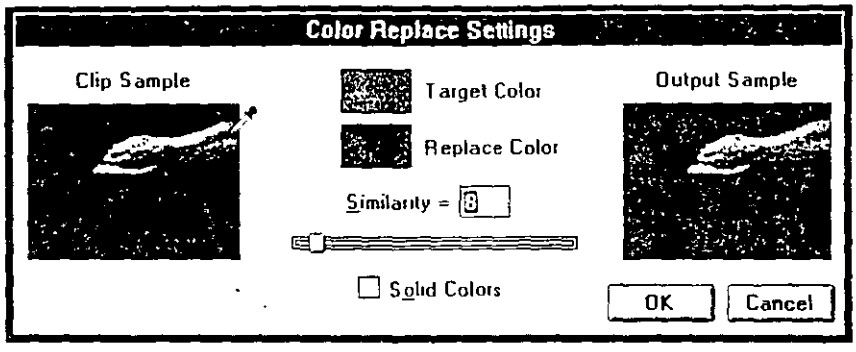
The Color Replace filter replaces all occurrences of a selected color with a new color.

To specify the Color Replace settings:

1 In the Color Replace Settings dialog box, select the color to be replaced by clicking the color in the Clip Sample box or by clicking the Target Color swatch to display the color picker and select a color. (For a description of the color picker, see "Using the Premiere Color Picker" on page 141.)

2 Select the replacement color by clicking the Replace Color swatch to display the color picker and select a color.

3 Drag the Similarity slider to select colors similar to the selected target color. Click Solid Colors to create an opaque replacement color.



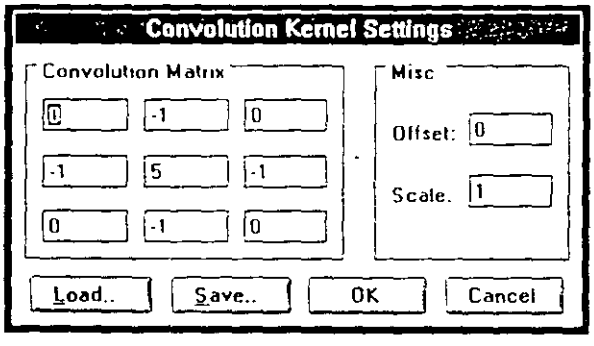
4 Click OK to apply the filter settings.

Convolution Kernel

The Convolution Kernel filter changes the brightness values of each pixel in the image according to a predefined mathematical operation known as a *convolution*. The Convolution Kernel Settings dialog box displays a grid that represents a pattern of pixel brightness multipliers; the source pixel is evaluated in the center of the grid.

To specify the Convolution Kernel settings:

1 Choose Filters from the Clip menu, select Convolution Kernel from the Available list, and click OK. The Convolution Kernel Settings dialog box appears.



2 Click the center text box, which represents the pixel being evaluated. Enter the value by which to multiply that pixel's brightness value. Values can range from +999 to –999.

3 Click a text box representing an adjacent pixel to which you want to assign a weighted value. Enter the value by which you want the adjacent pixel multiplied. For example, if you want the brightness value of the pixel to the right of the current pixel multiplied by 2, enter 2 in the text box to the right of the center box.

4 Repeat step 3 for all pixels you want to include in the operation. You don't have to enter values in all of the text boxes.

5 In the Scale text box, enter the value by which to divide the sum of the brightness values of the pixels included in the calculation.

6 In the Offset text box, enter the value to be added to the result of the scale calculation.

7 Click OK. The filter is applied to each pixel in the image, one at a time.

Crop

The Crop filter trims rows of pixels from the edges of a clip and automatically resizes the trimmed clip to its original dimensions. This can be useful for trimming away noise and pixel skew that may result from overscanning during digitizing. Use the slider controls to crop each edge of the image separately. You have the option of cropping in pixels or image percentage.

If you don't want Adobe Premiere to automatically resize the trimmed clip to its original dimensions, use the Clip filter (described on page 148) instead of the Crop filter.

Crystallize

The Crystallize filter creates a distorted mosaic pattern by clumping adjacent pixels into a solid color in a polygon shape, or *cell*. In the filter's dialog box, you can set the cell size from 3 pixels to 999 pixels.

Emboss

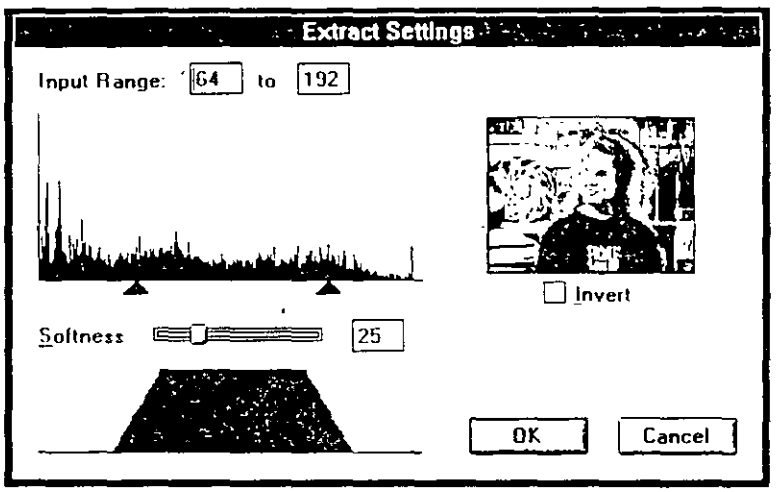
The Emboss filter makes an image appear raised or stamped by suppressing the color and tracing the edges with black.

Extract

The Extract filter extracts a grayscale mask from a video clip. The Extract Settings dialog box displays a histogram and a preview of the grayscale mask.

To extract a grayscale mask from a video clip using the Extract filter:

1 In The Extract Settings dialog box, drag the slider controls directly below the histogram to specify the gray levels of the source image that will be translated to white. All other areas will become black.



2 Adjust the intermediate shades of gray using the softness control.

3 To invert the effect, click the Invert button.

The display at the bottom of the dialog box shows the mapping function that is being applied to the image to generate the mask.

Field Interpolation

The Field Interpolation filter recreates a missing field (usually the odd or even scan lines that have been dropped during image capture) by using line averages. This filter can be useful for full-screen output where a missing field is likely to be noticeable.

Filter Factory

The Filter Factory filter lets you create your own filters for use by Adobe Premiere. For information on using the Filter Factory, see "Creating Custom Filters" on page 163.

Find Edges

The Find Edges filter outlines the edges of a color image with colored lines and outlines the edges of a grayscale image with white lines.

Gamma Correction

The Gamma Correction filter lightens or darkens an image without substantially changing the shadows and highlights. It does this by changing the brightness levels of the midtones (the middle-gray levels) while leaving the black and white areas unaffected. The default gamma setting is 1.0. In the filter's dialog box, you can adjust the gamma from 0.1 to 2.9.

Gaussian Blur

The Gaussian Blur filter blurs an image by a large amount; the effect is similar to that of choosing the Blur or Blur More filters several times. (*Gaussian* refers to the bell-shaped curve that is generated by mapping the color values of the affected pixels.) This filter improves the quality of images with sharp edges and can produce a hazy effect.

Gaussian Sharpen

The Gaussian Sharpen filter sharpens an image by a large amount; the effect is similar to that of choosing the Sharpen or Sharpen More filter several times.

Ghosting

The Ghosting filter overlays previous frames of a clip with other transparent frames to create a ghost-like effect.

Horizontal Flip

The Horizontal Flip filter reverses the image from left to right; the clip still plays in a forward direction.

Horizontal Hold

The Horizontal Hold filter slants the clip from a vertical to a horizontal orientation; the effect is similar to adjusting the horizontal hold on a television set. Drag the slider to increase the clip's slant.

Hue & Saturation

The Hue and Saturation filter adjusts the hue, saturation, and lightness of the image. Drag the sliders to maximize or minimize each color component. As you drag the sliders, the preview of the image in the dialog box changes to reflect your adjustments.

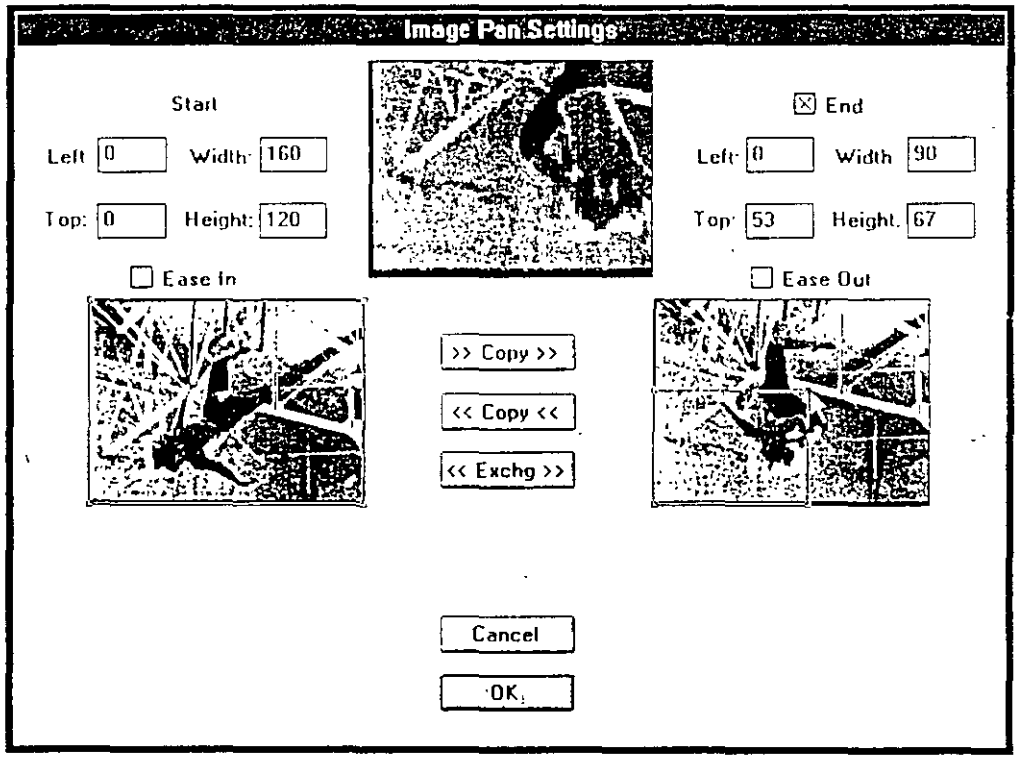
Image Pan

The Image Pan filter pans across images larger than the output frame size. You can easily create rolling credits, or simulate the pan and zoom movements of a camera. You can also use the Image Pan filter to scale an image up or down to match the output frame size.

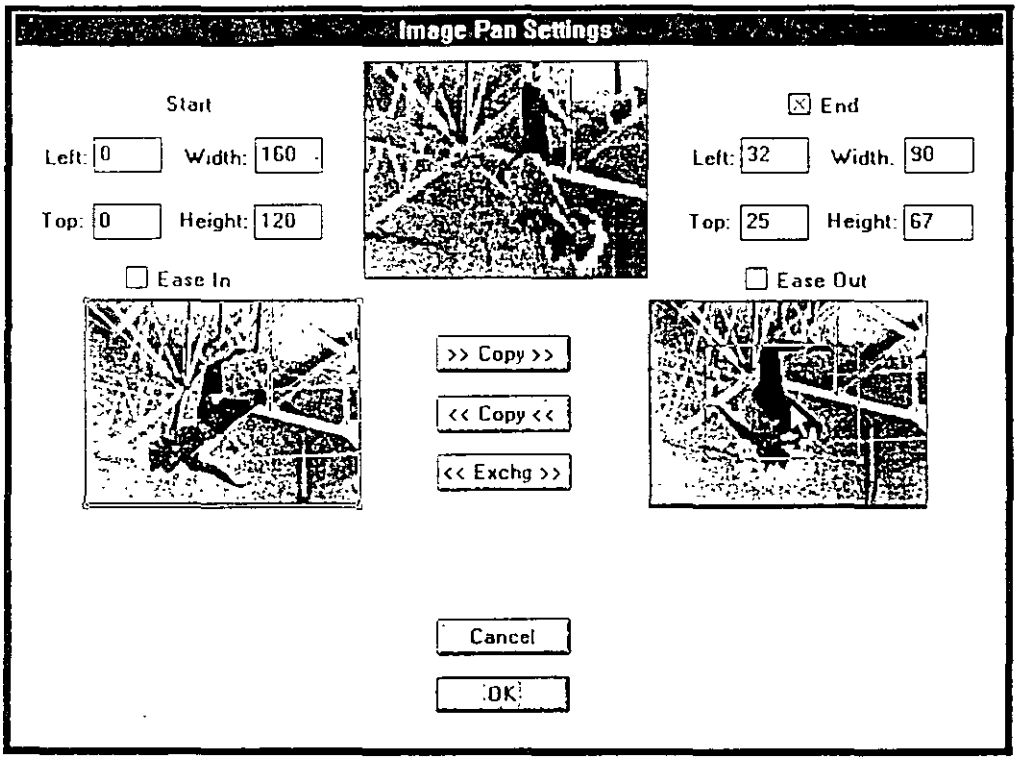
To pan across an image using the Image Pan filter:

1 In the Image Pan Settings dialog box, set cropping rectangles to define the starting and ending frames of the clip. The size and location of each cropping rectangle are shown above the starting and ending frames of the clip. Adobe Premiere then interpolates the motion between these frames.

2 Adjust the size of the cropping rectangles by clicking the corners and dragging.



3 Adjust the location of a cropping rectangle by clicking inside it and dragging.



4 Click OK when you have finished making adjustments.

You can produce a zoom effect by varying the size of the cropping rectangle in the starting and ending frames of the clip. You can produce a pan effect by placing the cropping rectangles at different locations in the starting and ending frames. If the source clip is large enough, you can set the size of the cropping rectangles to match the output frame size without causing the program to interpolate data (which can cause image degradation).

If you apply the Image Pan filter without adjusting the cropping rectangles, the full frames of the clip will be scaled to the output frame size of the movie. If the source clip has a frame size that is smaller than the output frame size, Adobe Premiere will use interpolation to cleanly scale the clip. Doing so provides better scaling than QuickTime can when it adjusts the size during the Make Movie process. Using the Image Pan filter this way is equivalent to using the Resize filter.

Invert

The Invert filter changes each color to its opposite on the color wheel.

Lens Flare

The Lens Flare filter simulates the refraction caused by shining a bright light into the camera lens. Specify a value (or use the slider) to indicate the percentage of brightness. Values can range from 10 percent to 300 percent. Select a lens type, and click anywhere inside the image thumbnail to specify a location for the center of the flare.

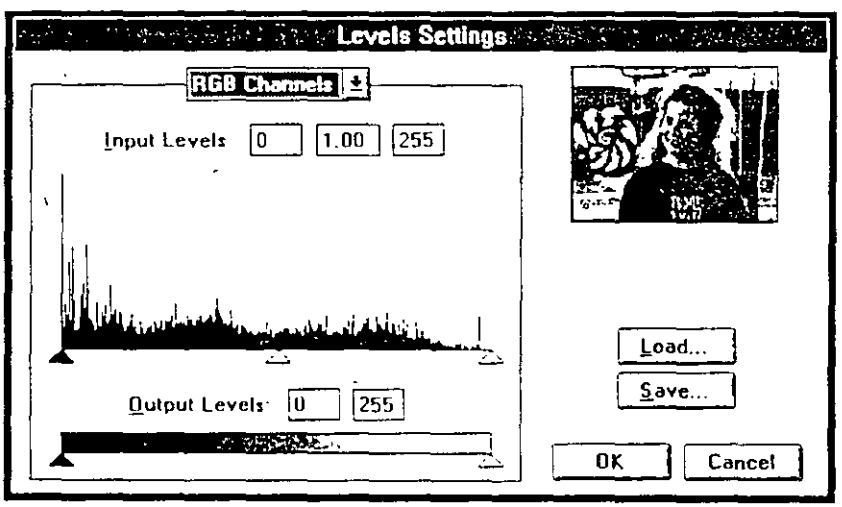
Levels

The Levels filter manipulates an image's brightness and contrast, and combines the functions of the Color Balance, Gamma Correction, Brightness & Contrast, and Invert filters.

You adjust the Levels setting using a histogram in the Levels dialog box. The *x*-axis of the histogram represents brightness values from darkest (0) at the far left to brightest (255) at the far right; the *y*-axis represents the total number of pixels with that value. The darkest pixels appear to the left; the brightest pixels appear to the right.

To adjust the brightness and contrast using the Levels filter:

1 In the Levels dialog box, enter values in the Input Levels text boxes, or drag the slider controls directly below the histogram to increase (or decrease) the contrast.



- To increase the shadows, drag the black triangle to the right. To decrease the shadows, drag the rectangle to the left.
- To increase the highlights, drag the white triangle to the left. To decrease the highlights, drag the triangle to the right.
- To adjust the midtones, drag the gray triangle.

2 Enter values in the Output Levels text boxes, or drag the slider controls at the bottom of the dialog box to reduce the contrast in the image.

- To eliminate the darkest values in the image, drag the black triangle to the right.
- To eliminate the brightest values in the image, drag the white triangle to the left.

3 Click OK when you have finished making changes.

Mirror

The Mirror filter reflects one side of the image onto the other side, as though a mirror were placed along the vertical or horizontal axis of the clip. You can choose a horizontal or vertical mirror, and you can choose to reflect the left, right, top, or bottom of the image.

Pinch

The Pinch filter distorts an image by stretching the image toward the center from the edges. The filter's dialog box contains an option for setting the percentage of pinching.

Pointillize

The Pointillize filter breaks up the color in an image into randomly placed dots (like a pointillist painting) and uses a black background as a canvas area between the dots. In Pointillize dialog box, you can set the cell size from 3 pixels to 999 pixels to specify the size of the dots.

Polar Coordinates

The Polar Coordinates filter converts a clip from its rectangular to polar coordinates and vice versa. This filter can create a cylinder anamorphosis, a type of art popular in the 18th century in which the distorted image is difficult to recognize unless viewed in the reflection of a mirrored cylinder.

Posterize

The Posterize filter converts the color spectrum into a limited number of colors and maps pixels in the image to the color that is the closest match. You can use this filter to create large, flat areas in an image. As you drag the slider in the filter's dialog box, the small preview image changes to reflect your adjustments.

Posterize Time

The Posterize Time filter displays a new frame at the interval you set in the filter's dialog box to create a halting effect as the clip plays, effectively lowering the frame rate.

Radial Blur

The Radial Blur filter produces a soft blur by simulating the effect of a zooming or rotating camera. Select the Spin blur method to blur along concentric circular lines, as if rotating the camera. Select the Zoom blur method to blur along radial lines. You can drag the dot in the Blur Center box to change the origin of the blurring. You can also set the Amount of the blur from 1 to 1000. With the Spin blur method, this value reflects the degree of rotation; with the Zoom blur method, this value reflects the intensity of the blur.

Replicate

The Replicate filter divides the screen into tiles and displays the whole image in each tile. You can set the number of tiles by dragging the slider in the Replicate Settings dialog box. Hold down the Shift key and drag to adjust both sliders to the same setting.

Resize

The Resize filter resizes the image to the output frame size using interpolated scaling. This provides better scaling than Video for Windows or QuickTime can achieve when it adjusts the size during the Make Movie process.

Ripple

The Ripple filter produces an undulating pattern on an image, like ripples on the surface of a pond. You can select a sine, circle, triangle, or square for the wave type, and adjust the intensity, rate, and width of the wave shape using the sliders in the filter's dialog box. You can also indicate the direction in which the ripple should move: Left, Right, In, or Out for the horizontal direction and Up, Down, In, or Out for the vertical direction.

Roll

The Roll filter rolls an image to the left or to the right, or up or down, as if the image were on a cylinder.

Sharpen and Sharpen More

The Sharpen and Sharpen More filters improve the clarity of an image by increasing the contrast in adjacent pixels.

Sharpen Edges

The Sharpen Edges filter finds the areas in the image where significant color changes occur and sharpens them.

Shear

The Shear filter distorts an image along a curve. Drag the band in the middle of the dialog box to form a curve that indicates how you want the image distorted. You can adjust any point along the curve. Select how to treat areas of the image left undefined by the shear:

• Wrap Around wraps the image to fill the undefined space so that the area is filled with content from the opposite side of the image.

• Repeat Edge Pixels extends the colors of the pixels along the edge of the image in the direction specified. This creates a banding effect if the edge pixels are different.

Solarize

The Solarize filter creates a blend between a negative and positive image, creating a "halo" effect. This effect is analogous to briefly exposing a print to light during developing.

Spherize

The Spherize filter wraps an image around a spherical shape, and is useful for giving objects and text a three-dimensional effect. You can set the intensity (amount) from –100 to 100. You can also select the direction in which the effect is applied: Horizontal Only, Vertical Only, or Normal (in all directions).

Tiles

The Tiles filter breaks up an image into a series of tiles. In the filter's dialog box, you specify the number of vertical tiles you want, the maximum distance you want a tile to be offset from its original position, and how you want to fill the area between tiles. You can fill area with white (the background color), with black (the foreground color), with an inverse image, or with the unaltered image.

Tint

The Tint filter applies a tint to an image. To select the tint color, click the color swatch in the Tint Settings dialog box to display the color picker. Set the level of the tint (from 1 to 100 percent) in the filter's dialog box. (For more information on the color picker see "Using the Premiere Color Picker" on page 141.)

Twirl

The Twirl filter rotates an image around its center. The image is rotated more sharply in its center than at the edges. In the filter's dialog box, you enter the twirl angle, ranging from –999 to +999.

Vertical Flip

The Vertical Flip filter flips an image upside down.

Vertical Hold

The Vertical Hold filter scrolls the clip upward; the effect is similar to adjusting the vertical hold on a television set.

Video Noise

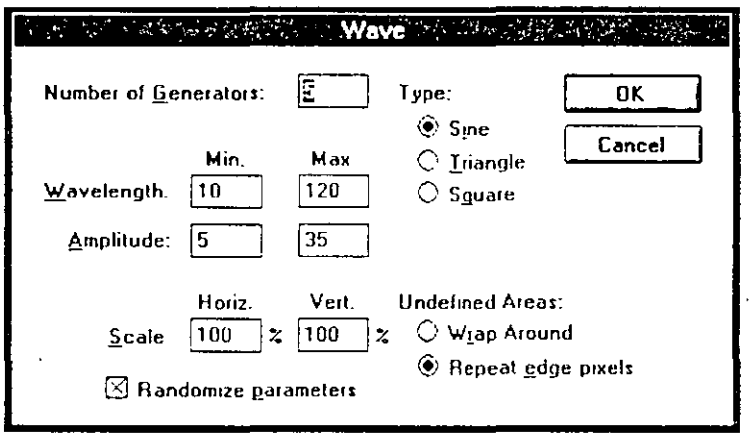
The Video Noise filter adds a small amount of video noise to a clip. This can be useful when you want to visually blend a clean still image or graphic with a video clip that has noise.

Wave

The Wave filter distorts an image to make it wave-shaped.

To specify the Wave settings:

1 Choose Filters from the Clip menu, select Wave from the Available list, and click OK. The Wave dialog box appears.



2 Specify the number of wave generators, from 1 to 100.

3 Specify the wavelength and amplitude for the generators. The *wavelength* is the distance from one wave crest to the next, specified by a value from 1 to 9999 in the Minimum and Maximum Wavelength fields. The *amplitude* is the height of the wave, specified by a value from 1 to 9999 in the Minimum and Maximum Amplitude fields.

4 Select Randomize if you want Adobe Premiere to randomly select a value that falls between the minimum and maximum wavelength and amplitude values; otherwise, the waves are of a uniform amplitude and frequency.

5 Set the horizontal and vertical scale from 1 percent to 100 percent. These parameters control the magnitude of the distortion, both horizontally and vertically. Setting them to 0 gives you an undistorted image.

6 Select the type of shape you want the waves to have: Sine (rolling), Triangle (pointed crests), or Square (square crests).

7 Set the Undefined Areas option to select how portions of the image pulled into the selection from the edges are treated. The Wrap Around option wraps the image to fill the space; the Repeat Edge Pixels option extends the colors of the pixels along the edge of the image.

8 Click OK.

Wind

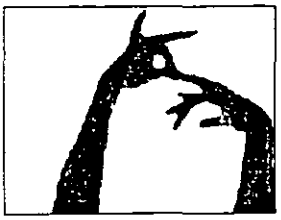
The Wind filter distorts an image to make it look as though wind were blowing pixels off the surface of the image. You can select the amount of distortion by selecting the Wind, Blast, or Stagger option. You can also change the direction of the "wind" to blow from the left or the right.

Zig Zag

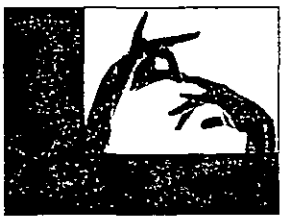
The Zig Zag filter distorts an image radially. The Amount field represents the magnitude of distortion; enter a value from 0 to 999. The Ridges field represents the number of direction reversals of the zigzag from the center of the clip to its edge; enter a value from 1 to 999. Select an option to displace the pixels in the image: the Pond Ripples option displaces pixels to the upper left or lower right; the Out From Center option displaces pixels toward or away from the center of the image; the Around Center option rotates pixels around th center of the image.

EFFECTS OF VARIOUS FILTERS

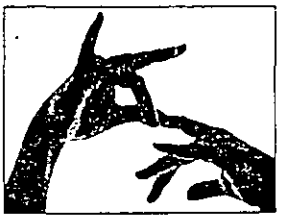
Brightness & Contrast



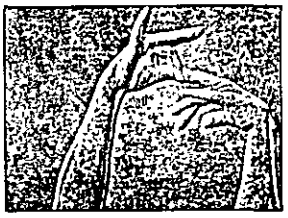
Camera Blur



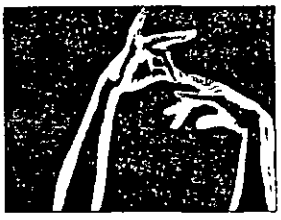
Clip



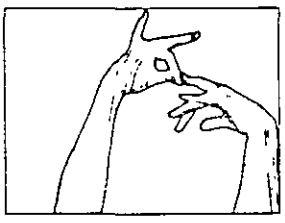
Crop



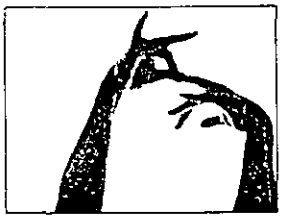
Emboss



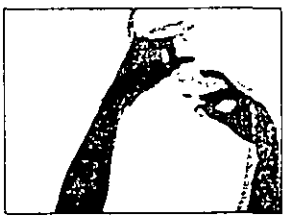
Extract



Find Edges

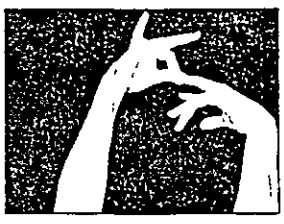


Gaussian Blur



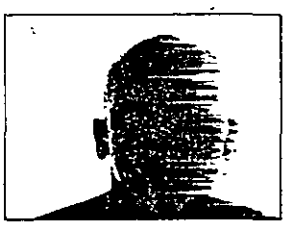
Ghosting

Horizontal Flip



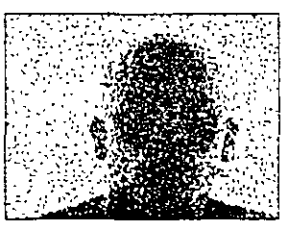
Invert

Lens Flare

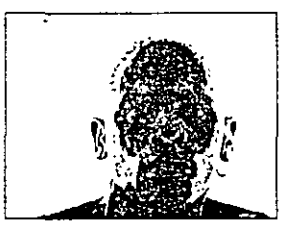


Wind

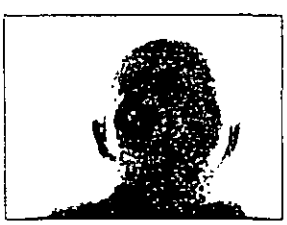
Pinch



Pointillize



Posterize



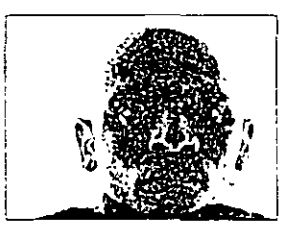
Radial Blur

Replicate

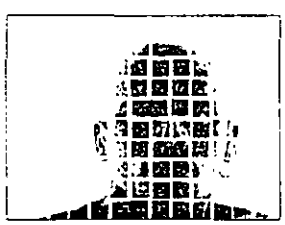
Sharpen

Shear

Solarize



Spherize



Tiles

Zig Zag

AUDIO FILTERS

Audio filters control selected frequencies and alter the overall sound of your audio clips. Adobe Premiere includes five audio filters:

- The Backwards audio filter plays sound backwards. This filter overrides any filter preceding it in the Filters dialog box. An alternate way to play a clip backwards is to set a negative speed for the clip. For information on setting clip speed, see "Setting the Forward or Backward Speed of a Clip" on page 95.
- The Fill Left and Fill Right filters allow you to isolate the audio track to one channel or another.
- The Echo filter creates an echo effect. The Echo Settings dialog box contains options for setting the delay and the intensity of the echo. The Delay option lets you control the length of time between the beginning of the original sound and the beginning of its echo.
- The Pan filter creates the effect of sound moving from left to right or right to left. The Pan Settings dialog box contains a slider to adjust the "location" of the sound.

CREATING CUSTOM FILTERS

In addition to the many filters included with Adobe Premiere, you can create your own filters using the Filter Factory. You determine how you want the filter to affect the channels (alpha, red, green, and blue) of each pixel in the first image and the second image by specifying arithmetic expressions.

The filters you create can also include a Setting dialog boxes. The Settings dialog box provides up to eight sliders for adjusting the filter's effect. When you design a filter, you include user-supplied slider information in the expression. You also determine the number of sliders and whether they appear in the Settings dialog box individually or in pairs.

When you create a filter, you can save its expressions in a text file. Doing so lets you use the Filter Factory to edit the filter later.

The next two procedures explain how to use the Filter Factory to apply and save filters for use in Adobe Premiere. For a complete discussion of using arithmetic expressions to achieve an effect, see Appendix B "Expressions for Creating Transitions and Filters." The expressions described in Appendix B are used by both the Filter Factory and the Transition Factory.

To create a custom filter:

1 In the Construction window, select the clip to which you will apply the filter.

2 Choose Filters from the Clip menu. The Filters dialog box appears.

3 Select Filter Factory from the Available list and click Add. The Filter Factory Settings dialog box appears.

4 Specify the expressions as follows:

• To specify an expression in the alpha channel, select Single Expression and type the expression in the A field. The evaluation of the alpha channel expression will be applied to each of the other three channels: R, G, and B. When the same value is applied to each channel of the pixels in an image, the image will be a grayscale image.

• To specify separate expressions for the R, G, and B channels, make sure the Single Expression option is deselected and type the expressions in the R, G, and B fields. Even if you specify the same expression in all three channels, their evaluations will probably be different.

As you type an expression, a small yellow caution sign appears. It will remain visible until you have typed a legal expression. If the caution sign does not disappear, it means that there is an error in the expression. To see which part of the expression is in error, click the caution sign to select the incorrect portion.

5 If the expressions include user-supplied slider information, drag the appropriate Map sliders to preview the effects. The Map 0 sliders correspond to sliders 0 and 1; the Map 1 sliders correspond to sliders 2 and 3; and so on. For information on including user-supplied slider information in expressions, see "Providing User-Controlled Sliders" on page 293.

6 When you have correctly set up the filter, click Save to save the expressions in a text file. Saving the expression allows you to load and edit the filter in the future. The text file should have the same name as the filter, but save the text file in a directory other than the Adobe Premiere *plugins* directory.

7 If you want to use this one instance of the filter only, click OK to apply the filter. If you want to use the filter more than once, use the next procedure, "To save a custom filter for additional use."

To save a custom filter for additional use:

1 Follow steps 1 through 6 of the previous procedure, "To create a custom filter."

2 Click Build. The Build Custom Filter dialog box appears.

3 Name the filter using the Title field. The name will appear in the Available list of the Filters dialog box and in the title of the filter's Settings dialog box, if there is one.

4 Use the Author field to include credits or copyright information in the filter's Settings dialog box. Delete any information you do not want.

5 If the filter's expressions include user-supplied slider information, select the appropriate number of Slider or Map options and specify labels for the sliders in the corresponding text boxes. The labels will appear with the sliders in the filter's Settings dialog box.

To display the sliders individually in the Settings dialog box, use the Slider options. To display the sliders in pairs, use the Map options. Whether you should use individual or paired sliders depends on the type of filter you are creating.

6 Click OK. A standard Save dialog box appears.

7 Save the filter in the Adobe Premiere *plugins* directory.

8 To make the filter available to users, restart the Adobe Premiere program.

To edit a custom filter:

1 In the Construction window, select the clip to which you want to apply the filter.

2 Choose Filters from the Clip menu. The Filters dialog box appears.

3 Select Filter Factory from the Available list and click Add. The Filter Factory Settings dialog box appears.

4 Click Load. Use the Open dialog box to load the text file containing the filter's expressions. You must have saved the expressions in a text file when you created the filter to be able to edit it.

5 Follow the steps in the previous two procedures to edit and rebuild the filter.

CREATING MOTION

Adobe Premiere lets you define a path along which a clip can move in the movie frame. You can define a motion path for any movie or still-image clip. You begin by creating points on a motion path; then you can choose from several motion options for each point on the path.

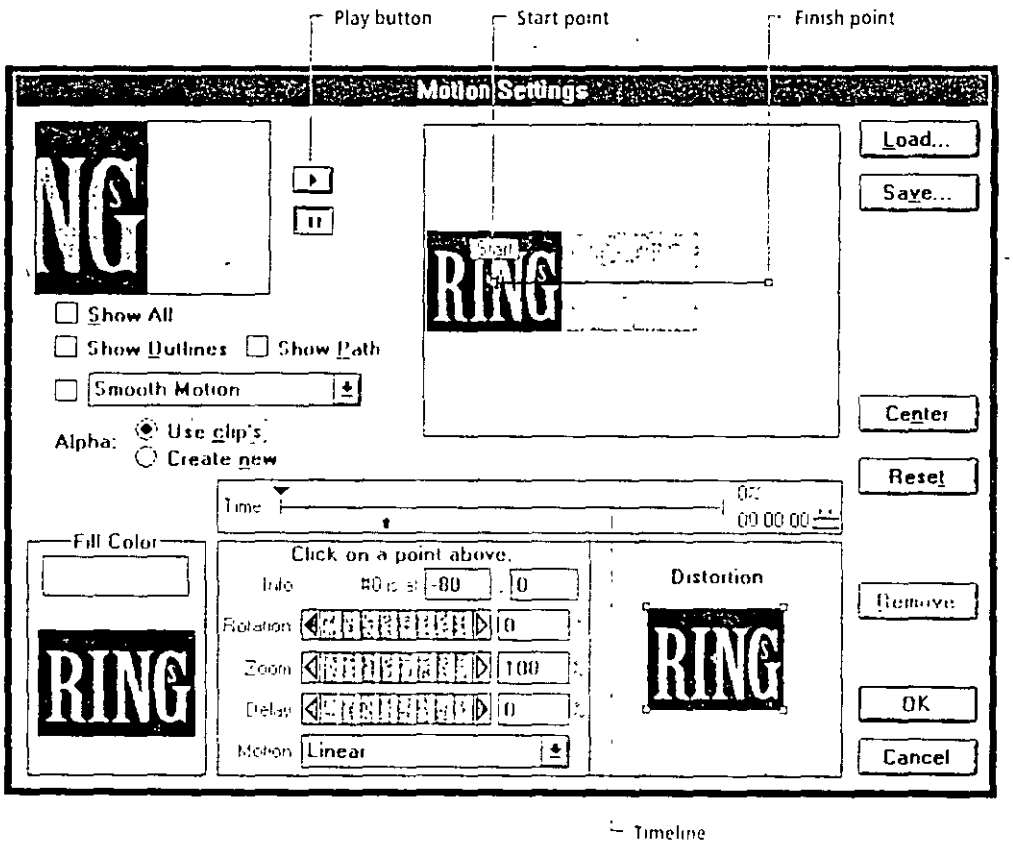
Note: Adobe Premiere uses subpixel motion. This positions an image in increments of 1/256 pixels, resulting in extremely smooth motion and rotation.

To define a motion path for a clip:

1 Select a clip in the Construction window.

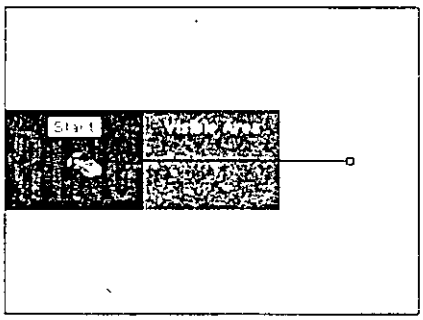
2 Choose Motion from the Clip menu or from the Construction window pop-up menu. The Motion Settings dialog box appears.

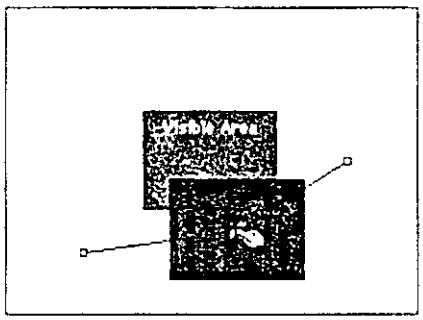
In the top left corner of the dialog box, a sample of the selected clip appears as it moves along the default motion path. The default path has only Start and Finish points.



3 Set points on the motion path using one of the following methods:

- Move the Start and Finish points.
- Position the pointer anywhere on the motion path. The pointer turns into a pointing finger. Click to add a point to the path, and drag to adjust its position on the path. When you release the mouse, the point is selected and you can add options to the selected point.





- Click above the timeline.

Adjusting points on the motion path

Once you have created each of the points on the motion path, you can select and adjt each point's position.

To select a point on the motion path, use one of the following methods:

- Click a point with the finger pointer.
- Press the Tab key to select successive points from the Start to Finish positions along the motion path. Hold down the Shift key and press Tab to move from point to point in the opposite direction.

Note: *If a text entry box is active in the Motion Settings dialog box, pressing Tab will highlight successive text boxes rather than select successive motion points.*

To adjust the positioning of a point on the motion path:

1 Select the point.

2 Use one of the following methods to adjust the point's position:

- Press an arrow key to move the selected point 1 pixel at a time in the direction of the arrow.
- Hold down the Shift key and press an arrow key to move the point in 5-pixel increments.
- Enter coordinates for the point's position in the Info field below the timeline.

To center the image frame at a point on the motion path:

1 Select the point.

2 Enter the coordinates (0, 0) for the point's position in the Info field below the timeline, or click the Center button to let Adobe Premiere enter these coordinates.

To copy the motion settings from one point to another point:

1 Select the point from which you want to copy the settings.

2 Press Ctrl+C.

3 Select the point you want to paste settings to, and press Ctrl+V.

To delete a point:

Select the point, and press Delete.

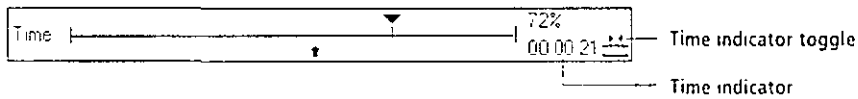
Observing the effects of motion

The motion settings are applied to the sample in the upper-left corner of the Motion Settings dialog box, letting you see the settings' effects immediately.

You can also preview the motion settings by dragging through the gray bar below the timeline. To observe the effects for specific points along the motion path, click the Pause button next to the motion thumbnail and click a point on the gray bar below the timeline. You can also use the spacebar to start and pause the preview. Click Show All to see the other video tracks in your movie included in the preview.

Changing the speed of motion

Points that have been added to the motion path are represented on the timeline below the path. The length of the timeline represents the duration of the clip. The relative speed of motion between path points is determined by the distance between points along the timeline. Adjust the speed by dragging points closer together or farther apart along the timeline.



The time indicator next to the timeline displays the time setting for the selected point in one of two ways:

- If you set the blue time indicator toggle so that the two arrows touch, the time shown is where the point occurs, measured from the beginning of the clip.

- If you set the toggle so that the two arrows are separated, the time shown is where the point occurs, measured from the beginning of the project in the Construction window.

Specifying motion options

This section describes how to use the Motion Settings dialog box to specify movement options along a clip's motion path. An image can be rotated, distorted, and zoomed in or out along the path.

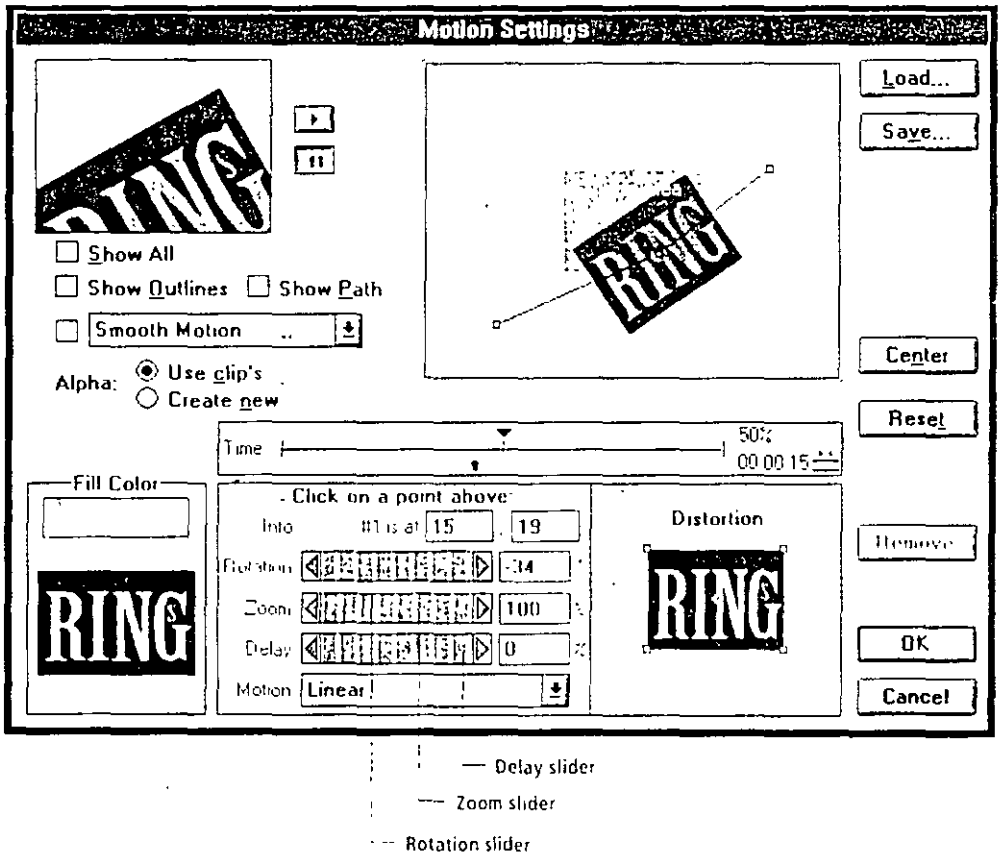
Adobe Premiere distributes the effects of movement options between successive points on the motion path. For example, suppose you have a motion path with successive points A, B, and C. Point A has a rotation setting of 0 degrees; point B has a rotation setting of 90 degrees; and point C has a rotation setting of 0 degrees. The clip is oriented at 0 degrees at point A. The clip rotates 90 degrees clockwise as it moves between points A and B; then it rotates 90 degrees counterclockwise as it moves between points B and C to return to its 0 degree orientation.

To set movement options for a point on a path:

1 In the Motion Settings dialog box, click to select a point where it falls on the timeline or along the motion path.

2 Choose from the following options:

• Rotation. Determines the angle of rotation for a clip at a specific point. The angle can range from –1440 degrees to 1440 degrees, resulting in up to eight full rotations of the clip. The clip begins to rotate as it moves from the preceding point on the motion path toward the selected point on the motion path. Use the tractor tread slider control, or type in an angle for the rotation.



— Delay slider

— Zoom slider

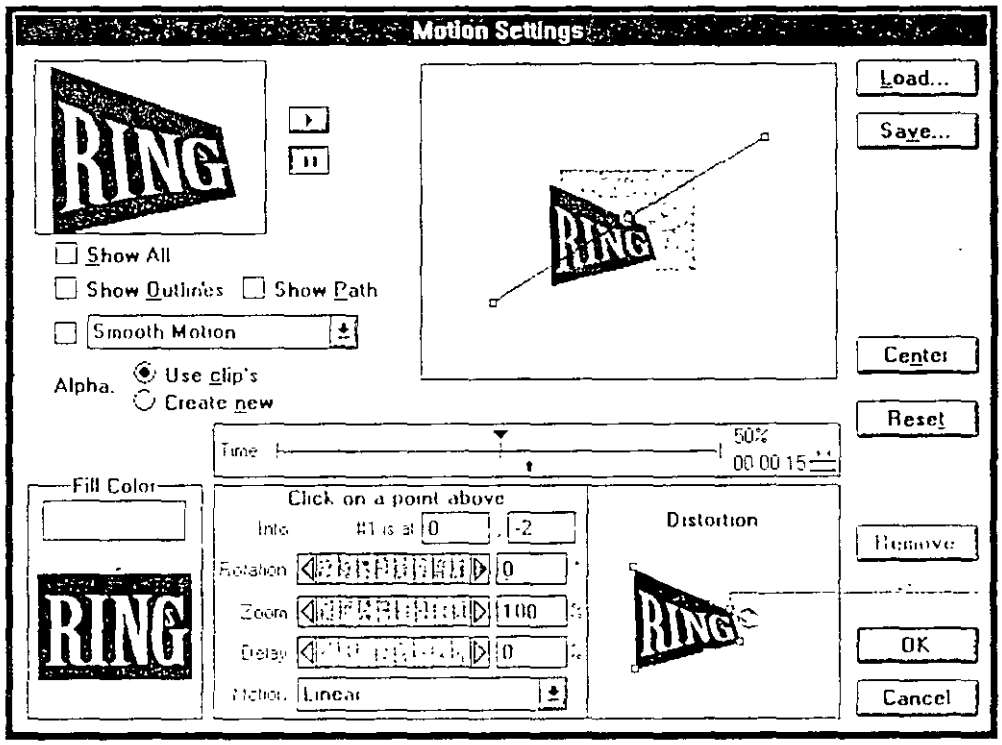
— Rotation slider

• Zoom. Increases or decreases the size of a clip at a specific point on the motion path. Adjust the zoom level using the tractor tread slider control or by typing in a value between 0 percent and 500 percent.

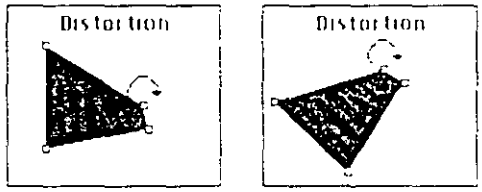
• Delay. Causes a clip to pause for an amount of time on the motion path. To set a delay, use the tractor tread slider. A blue bar appears on the timeline, indicating the length of the delay. A percentage value for the delay (relative to the total clip duration) appears next to the slider.

• Motion. Achieves smooth motion when zooming by speeding up or slowing down movement where necessary. If the clip's motion is zooming from small to large, select Accelerate. If the clip's motion is zooming from large to small, select Decelerate.

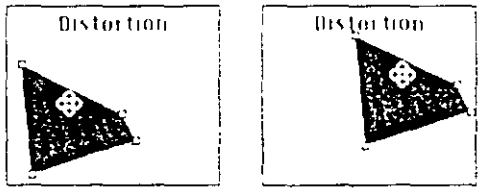
• Distortion. Distorts the image at a point along the motion path. Drag the four corners of the thumbnail image in the distortion box to define the distortion.



To spin a distorted image around a center point, hold down the Alt key and position the pointer on a corner point; then drag to spin the image around a center point.



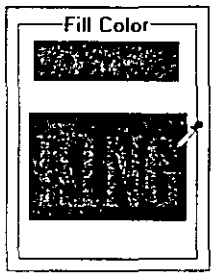
To move all four corner points at once, position the pointer in the center of the image.



• Reset. Removes the distortion, delay, rotation, and zoom settings for a selected point.

3 Set the following motion options that apply to all points on the path:

• Fill Color. Specifies a background color for the moving clip. To select a background color, click the desired color on the thumbnail in the Fill Color box (the pointer turns into the eyedropper tool when it is on the thumbnail), or click the color swatch above the thumbnail to access the color picker and choose a color.



• Smooth Motion. Smooths the path along which the clip travels. This option smooths sharp changes in direction, rotation, and distortion. You can control the smoothness of the path by choosing an option from the drop-down list. The Smooth Motion option provides the smallest amount of smoothing; the Averaging-High option provides the greatest amount of smoothing.

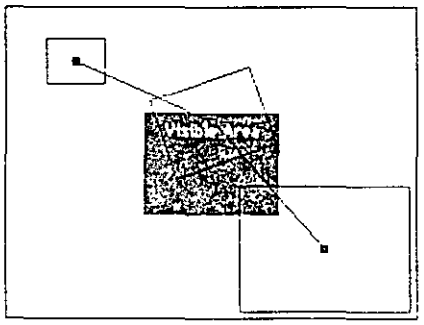
• Alpha: Use Clip's. Superimposes a clip using its existing alpha channel. This is the normal setting for titles or graphics created in another application that has alpha channels, such as Adobe Photoshop. This option will only affect clips that have been assigned an Alpha Key Type in the Transparency Settings dialog box.

• Alpha: Create New. Creates an opaque fill for clips that do not have an existing alpha channel. With this option selected, an alpha channel is created in the shape of the clip as it moves. This option only affects clips that have been assigned an alpha key type in the Transparency Settings dialog box.

Note: *Choosing the Create New option for an image containing an alpha channel overwrites the original alpha channel when the image is superimposed.*

• Show All. Displays the image along the motion path as it would be composited in the Construction window, including transitions, filters, and transparency settings. Note that the motion thumbnail will not play as smoothly with this option selected.

• Show Outlines. Displays an outline of each frame along the motion path.



• Show Path. Shows the motion path in more detail. All points between the key frames (represented as small squares) are shown as dots along the motion path. Selecting this option makes it easier for you to check the motion path, especially at points where the motion accelerates or decelerates.

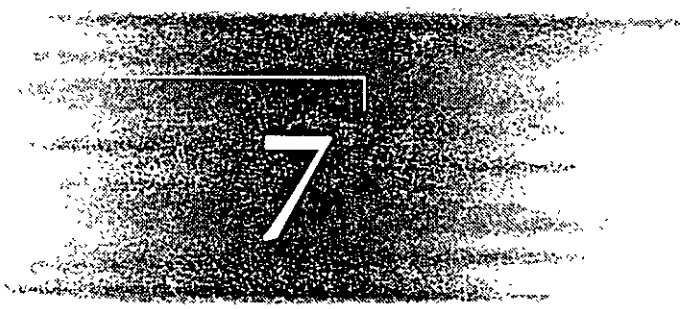
Saving, loading, and deleting motion settings

You can use the Save and Load buttons in the Motion Settings dialog box to save the motion settings you create for a clip for later use with other clips. Motion settings a applied to entire clips; they cannot be applied to a limited number of frames of a clip.

To remove all motion settings applied to a clip, click Remove in the Motion Settings dialog box.

Note: *Adobe Premiere includes a set of motion path settings, which are contained in the* motion *subdirectory in the Adobe Premiere directory.*

Chapter



Chapter 7: Creating Superimpositions and Titles

This chapter explains how to superimpose movie and still-image clips. It also describes how to use Adobe Premiere's Title window to create titles and graphics for a movie. The Title window lets you create clips with type. Title clips can be superimposed to create titles and credits that play over other clips.

SUPERIMPOSING CLIPS

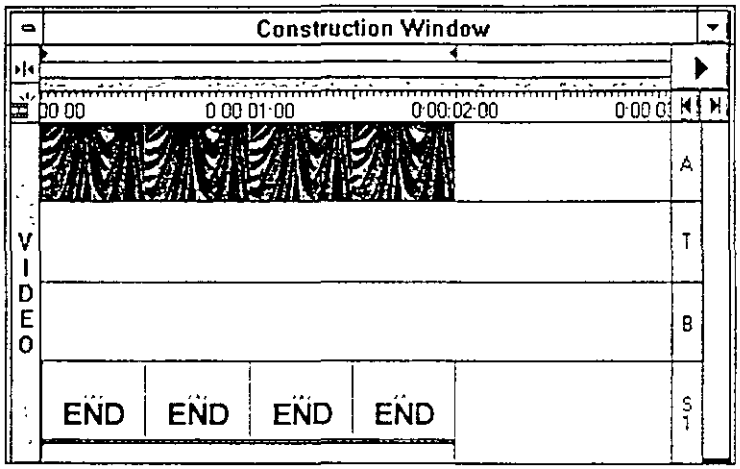
The process of superimposition, called *keying* in television production and *matting* in film production, incorporates various methods of playing a clip over another clip. You make areas of the top clip, called the *superimposed clip*, transparent to allow the bottom clip (or background clip) to show through. Adobe Premiere creates transparency in the superimposed clip in a variety of ways, from blocking out portions of the clip (creating a matte) to specifying ranges of color to be transparent.

Clips that you want superimposed can go on any of the superimpose (S) tracks in th Construction window. Clips that you want playing underneath go on tracks A or B, aligned with the clips on the S track. Adobe Premiere constructs superimpositions by first assembling the clips on tracks A and B, including any effects on the transitions (T) track, and then superimposing the clips on the S tracks onto the assembled clips. Clips on the S tracks are superimposed in numerical order as they appear in the Construction window. Thus, clips on higher numbered S tracks are played over clips on lower numbered S tracks.

Once you place a clip on an S track, you can specify the parts of the clip that you want to make transparent using the Transparency Settings dialog box.

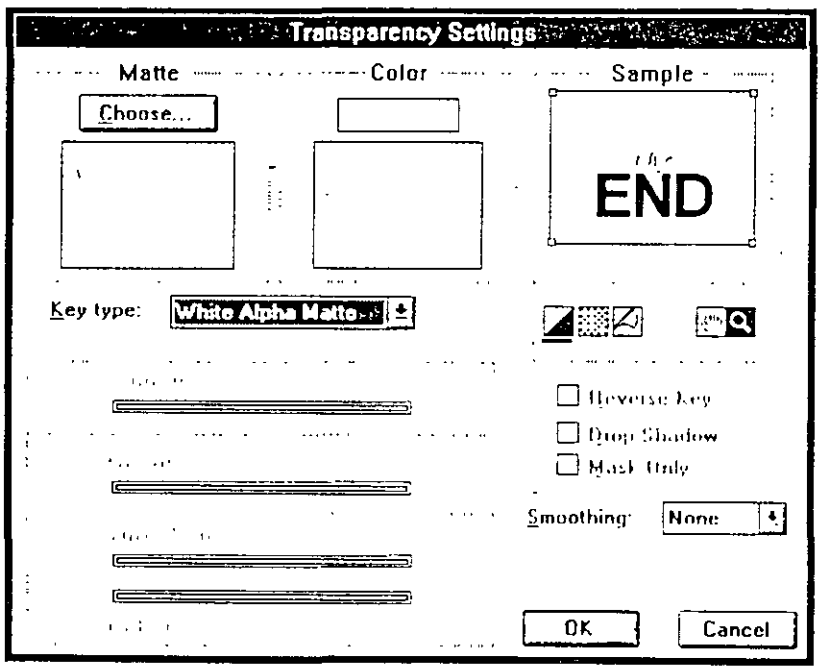
To superimpose a clip:

1 Drag the clip from the Project window to an S track in the Construction window.



2 Select the clip on the S track.

3 Choose Transparency from the Clip menu. The Transparency Settings dialog box appears.



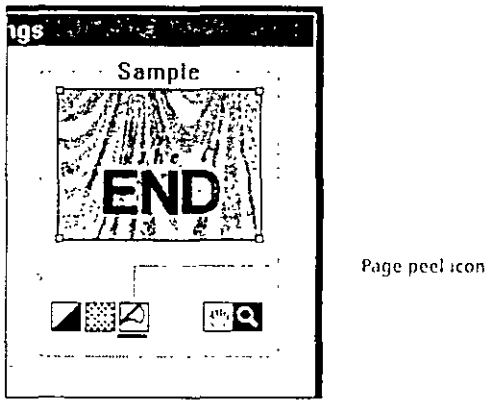
The first frame of the clip appears in the Sample box in the upper-right corner of the dialog box. For some key types the frame will also appear in the color swatch.

Note: *Because the effects of any filters applied to a clip are displayed in the Transparency Settings dialog box, filters can slow the display of the dialog box considerably. If possible, select transparency settings before applying filters to a superimposed clip.*

4 Choose a key type from the Key Type drop-down list. For an explanation of key ty see "Selecting a Key Type for a Clip" on page 179.

5 Choose one of three options for the way the background appears in the Sample box:

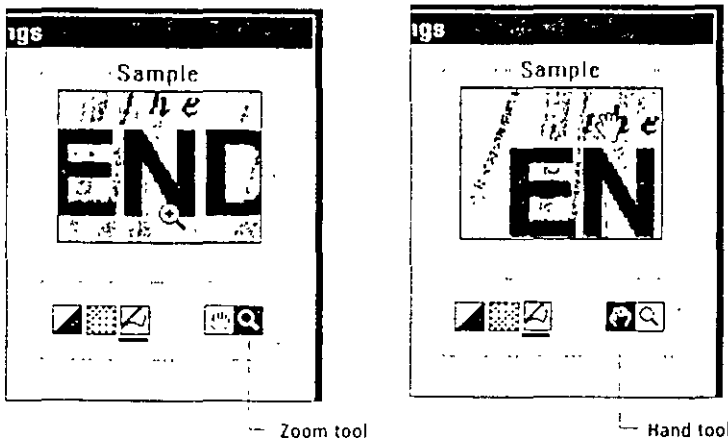
- Set the background to black or white by clicking the black-and-white icon below the Sample box (continue clicking to toggle between white and black).
- Set the background to checkerboard by clicking the checkerboard icon (click again to reverse the pattern).
- To see the actual background image in the sample image, click the page peel icon.



6 Specify the areas of the clip to be transparent by adjusting the settings for the selected key type. For a description of the settings, see "Making Key Type Adjustments" on page 186.

For increased control in adjusting transparency settings, use the zoom and hand tools located below the Sample box:

- To zoom in on the sample image, select the zoom tool and click the image.
- To zoom out, Alt+click the image with the zoom tool.
- To reposition a close-up view of the image in the Sample box, use the hand tool.



• To show the sample image at actual size, double-click the zoom tool icon. The plus or minus sign in the zoom tool appears as an outline when the image is being viewed at true size.

• To fit the sample image in the Sample box, double-click the hand tool icon.

When you have selected the zoom tool, holding down the spacebar selects the hand tool. Likewise, you can select the zoom tool while the hand tool is selected by holding down the Ctrl key (to zoom in) or the Alt key (to zoom out).

If the clip is a movie clip, use the slider under the Sample box to scroll through the clip and see the effect of the transparency settings on each frame.

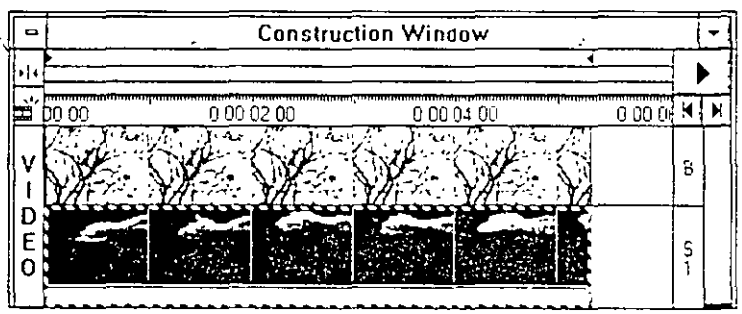
7 Click OK to apply the transparency settings.

Creating a garbage matte

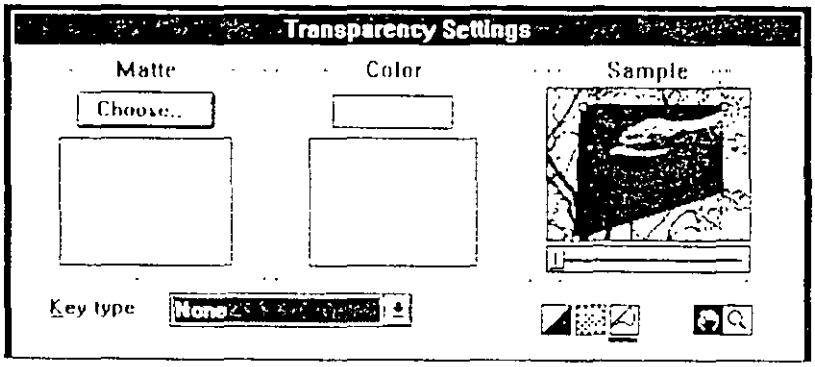
With all key types, Adobe Premiere allows you to create a *garbage matte,* which blocks out areas of the clip to be transparent. The underlying clip shows through the blocked out areas.

To create a garbage matte:

1. Select the clip for which you want to create the garbage matte, and choose Transparency from the Clip menu. The Transparency Settings dialog box appears.

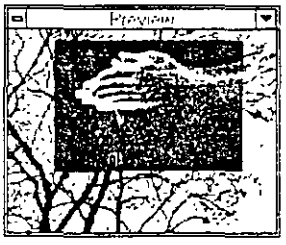


2 Create the shape for the garbage matte by dragging the handles in the corners of the clip in the Sample box.



3 To make the areas outside the garbage matte transparent, select the Reverse Key option.

4 Click OK.



Movie cropped by garbage matte

Note: Garbage mattes do not move with clips that have motion settings applied to them. For moving masks, the Track Matte key type is recommended.

Selecting a key type for a clip

Adobe Premiere provides 15 *key* (superimpose) options that can be applied to a clip on an S track. The key type determines what part of the image is "keyed out," that is, what part of the image is made transparent. Although all key types are described in this section, tl effects of several key types are best displayed in color and are illustrated in Chapter 10, "Tips and Techniques."

None

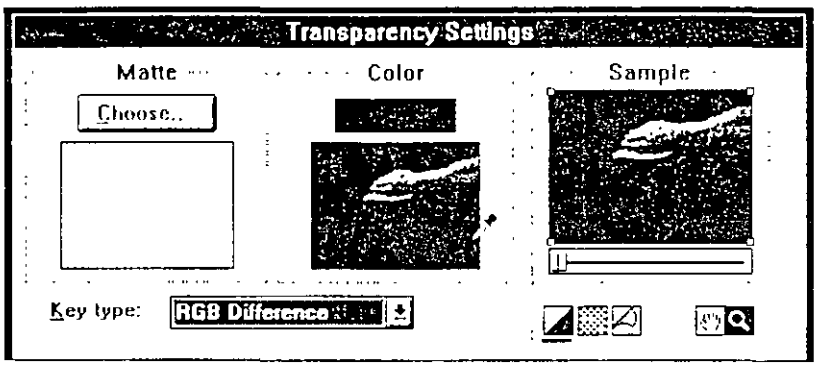
The default key type is None. At this setting, no part of the superimposed image is keyed out. However, you can set the opacity of the superimposed image by adjusting the Fade control beneath the clip on the S track. You can also use the None key type for creating garbage mattes. For more information on the Fade control, see "Adjusting the Intensity of a Superimposed Clip" on page 187.

Chroma

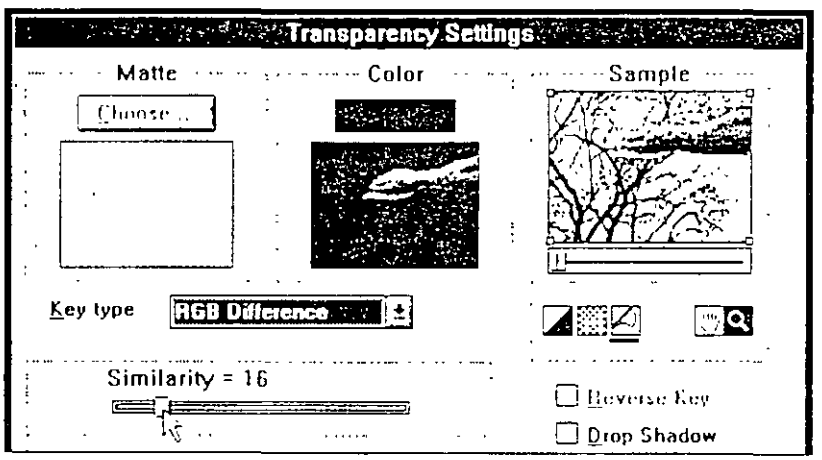
The Chroma key type allows you to select a color or a range of colors in the clip to be transparent. Use the eyedropper tool to select a color from the image, or click the color swatch to select from the color picker. Use the Similarity slider to select the range of similar colors to be keyed out. For more information on choosing a color, see "Selecting a Color to be Transparent" on page 187. For an example of using the Chroma key type, see "Superimposing Figures Against a Background" on page 256.

RGB Difference

Like the Chroma key type, the RGB Difference key type lets you select a color or a range of colors that will become transparent in the clip. The difference between the Chroma and RGB Difference key types is that the Chroma key type lets you adjust the color and the gray values of the superimposed pixels independently, while the RGB Difference key type adjusts these components together. Use the eyedropper tool to select a color from the image or click the color swatch to select from the color picker. Use the Similarity slider to select a range of similar colors. For more information on choosing a color, see "Selecting a Color to be Transparent" on page 187.



Selecting a color to be transparent



Adjusting the Similarity slider to select a range of colors

Luminance

The Luminance key type lets you key out the image's gray values, while retaining its color values. Use the Threshold and Cutoff sliders to adjust the shadows and definition of detail in the image. For an example of using the Luminance key type, see "Adding Texture to Movies" on page 255.

Alpha Channel

An *alpha channel* is an invisible grayscale channel assigned to an image, often used for creating masks that isolate part of the image. The Alpha Channel key type lets you superimpose an image by keying out the black areas of an image's alpha channel and making the white areas of the alpha channel opaque. You can select the Reverse Key option to reverse (invert) the alpha channel.

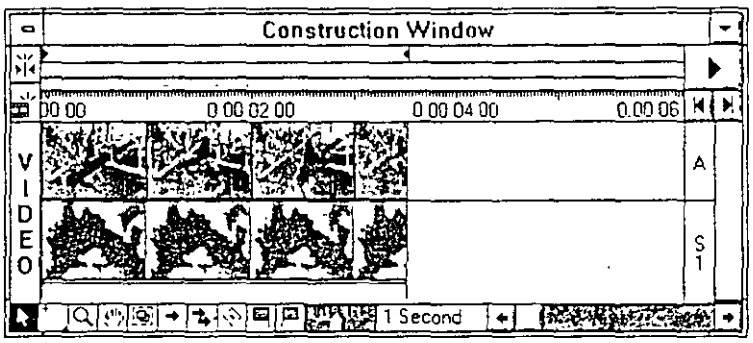
The Alpha Channel key type does not create an alpha channel in an image. When you create titles, Adobe Premiere automatically creates an alpha channel. You must create the alpha channel in other applications with that capability, such as Adobe Photoshop. See your application's user documentation for an explanation of how it creates alpha channels.

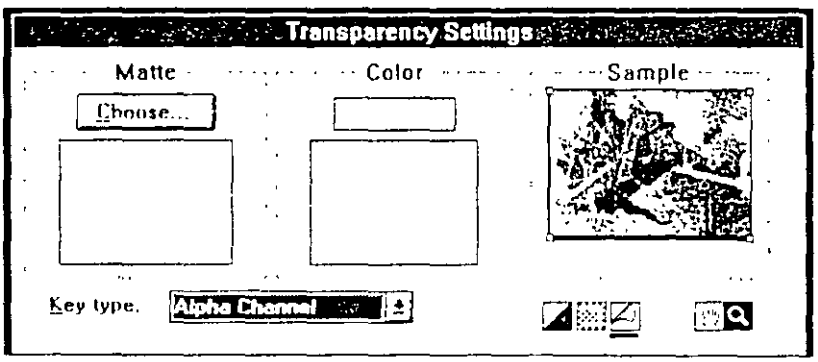
If your image has a *straight* alpha channel, use the Alpha Channel key type. If your image contains a *premultiplied* alpha channel, use either the White Alpha Matte or Black Alpha Matte key types because the Alpha Channel key type can cause a white or black halo around the image. (You can tell the difference between straight and premultiplied alpha channel images because a straight image may have some blockiness while a premultiplied image will not.) An alpha channel superimposition created on a black or white background (for example, titles on a white background) works best when using the Black Alpha Matte or White Alpha Matte key type. An Adobe Premiere title has a premultiplied alpha channel.

The following illustration shows an Adobe Photoshop still image with a *gradation* (blend) in the alpha channel. The gradation in the alpha channel causes the image of the clouds to fade as the gradation darkens. The area where the alpha channel is solid black is transparent. The area becomes less transparent as the gradation blends to 50-percent gray, and it becomes opaque where the gradation is either less than or equal to 50-percent gray or all white.

Still image with gradation in the alpha channel

Gradation in alpha channel

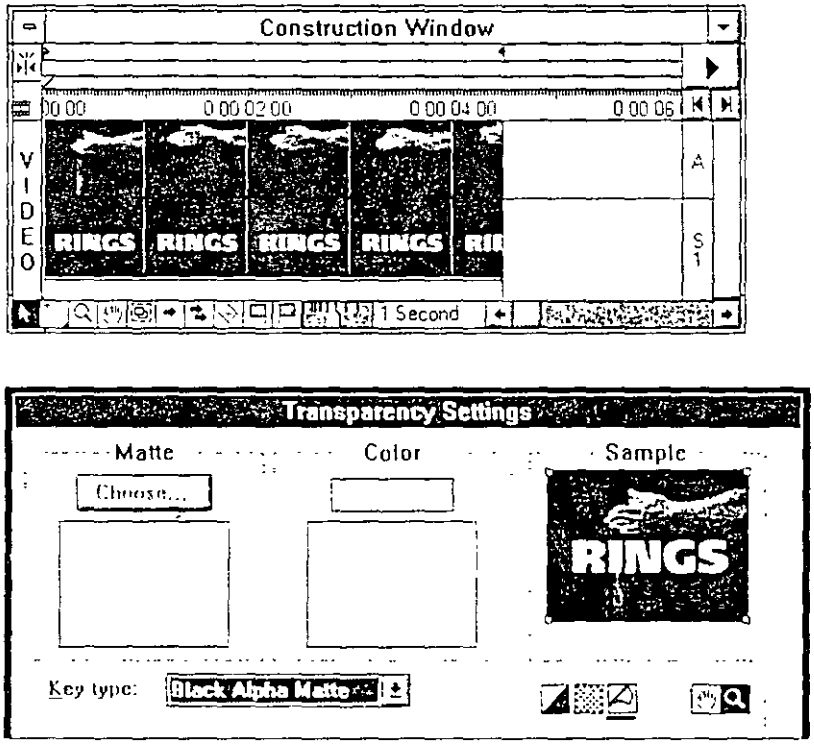




Cloud image fades as gradation darkens in alpha channel

Black Alpha Matte

Choose the Black Alpha Matte key type to superimpose an image that contains an alpha channel and that has been created on a black background. (Note that Adobe Premiere automatically creates alpha channels for titles.) The Black Alpha Matte key type eliminates the remnants (halo) of black around the edges of the foreground image. If the Black Alpha Matte key type does not produce satisfactory results, try the Alpha Channel key type.

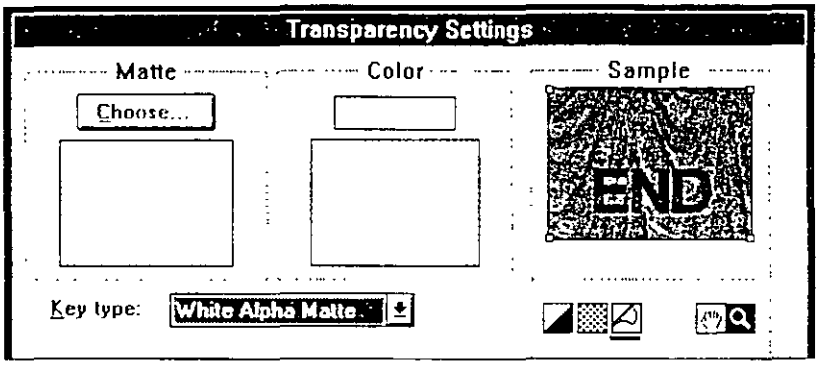


Black Alpha Matte key type selected

White Alpha Matte

Choose the White Alpha Matte key type to superimpose an image that contains an alpha channel and that has been created on a white background. (Note that Adobe Premiere automatically creates alpha channels for titles.) The White Alpha Matte key type eliminates the remnants (halo) of white around the edges of the foreground image. This type

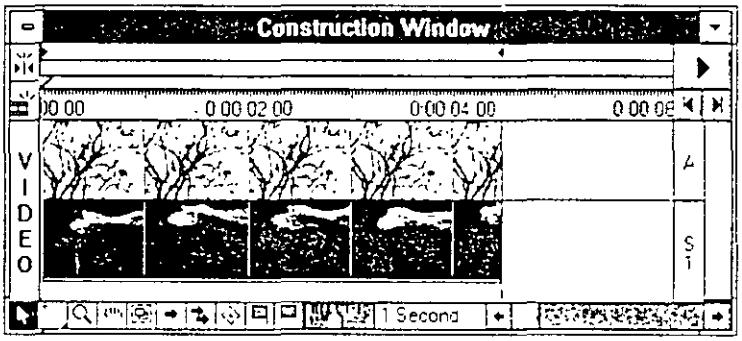
of matte is useful for superimposing titles that have been created on a white background. If the White Alpha Matte key type does not produce satisfactory results, try the Alpha Channel key type.

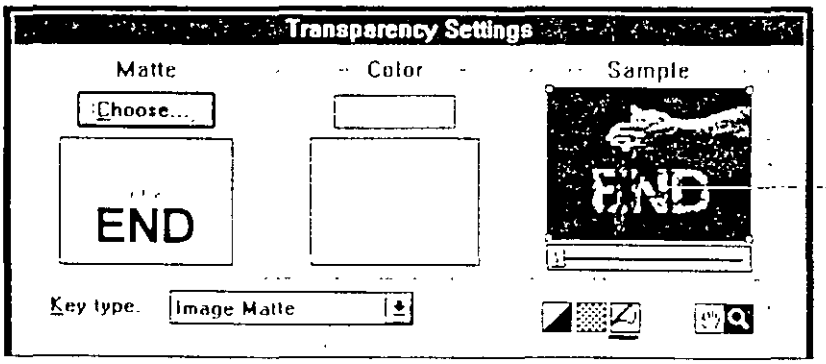


White Alpha Matte key type selected

Image Matte

The Image Matte key type lets you play the movie through a still image placed on top of the clip on the S track. Once you have chosen the image, it is displayed in the Matte sample box and in the Sample box (combined with the superimposed clip) to show how the key type affects the superimposed clip. To select an image for the matte, click the Choose button in the Matte sample box and use the Open dialog box to open the file you want to use.



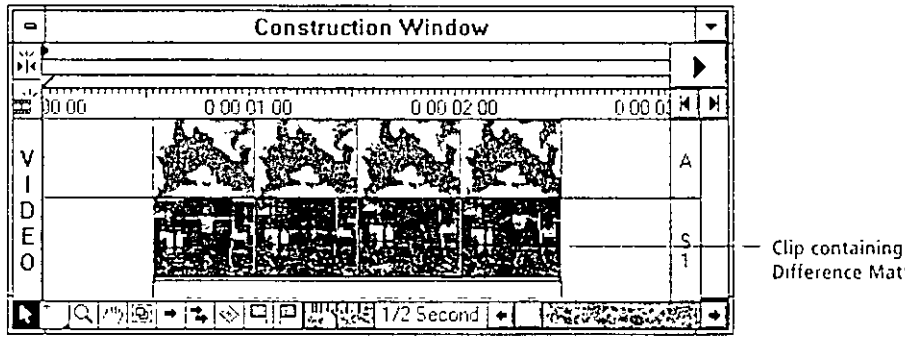


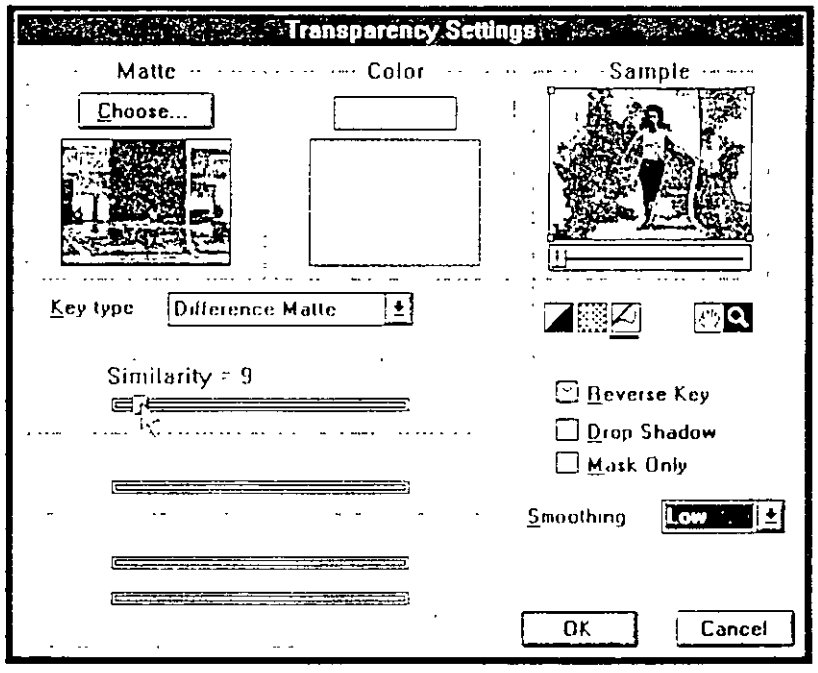
Background image of clouds appearing through image matte

Image Matte key type selected

Difference Matte

The Difference Matte key type keys out the identical areas of two clips and retains the difference. For example, if two frames contain identical backgrounds but one of the frames contains an image in the center of the frame, only the image in the center of the frame is retained. To select an image for the difference matte, click Choose in the Matte sample box and use the Open dialog box to open the clip you want to use.





Difference Matte key type selected

Blue Screen and Green Screen

The Blue Screen and Green Screen key types are used on images with true chroma blue and true chroma green backgrounds. After choosing the desired key type, drag the Cutoff slider to the right until the contrast in the foreground image stabilizes; then drag the Threshold slider to the left until the blue or green background is transparent. To adjust the tightness of the key, drag the Cutoff and Threshold sliders an equal distance to the left. If the background is bleeding through, move the Cutoff slider to the right.

Chroma blue is a solid blue containing little or no red or green and corresponds approximately to PANTONE® 2735. *Chroma green* is a solid green containing little or no red or blue and corresponds approximately to PANTONE 354.

Multiply

The Multiply key type keys out the areas of the superimposed image that are lighter than the underlying image. Use the Cutoff slider to control the opacity of the resulting superimposed image. For an example of using the Multiply key type, see "Creating a 360-Degree Presentation" on page 266.

Screen

The Screen key type lightens the areas of the underlying image that are lighter than the superimposed image. Use the Cutoff slider to control the brightness of the underlying image.

Track Matte

The Track Matte key type uses the clip on the next S track of the Construction window as a matte. A track matte can be created from a moving or still image. A track matte created from moving images is called a *traveling matte*. For an example of using the Track Matte key type, see "Playing a Movie Through a Traveling Matte" on page 262.

Not Red

The Not Red key type is designed for use with images that have green or blue backgrounds. It is similar to the Blue Screen and Green Screen key types, but its Blend slider lets you create semitransparent objects and helps reduce fringing around the edges of nontransparent objects. It works especially well with green backgrounds.

Making key type adjustments

Once you have selected a key type for the clip, you can adjust the effect of the key and select other options associated with that key type in the Transparency Settings dialog box. Controls and options are grayed out if they are not available for the selected key type.

- The Similarity slider lets you select a range of colors to be transparent. To select a range of colors similar to the one in the color swatch, drag the Similarity slider between None and High; the higher the Similarity setting, the broader the range of colors in the selection.
- The Blend slider smooths sharp transitions in color by creating a gradual change in opacity in the pixels between the two colors.
- The Threshold slider lets you adjust the amount of shadow in a superimposed clip.
- The Cutoff slider lets you adjust the shadow detail with the luminance and chroma keys.

• The Reverse Key option allows you to reverse the transparent area (for example, from the area inside a matte to the area outside a matte).

• The Drop Shadow option applies a 50-percent gray shadow slightly below and to the right of the transparent portion of the clip.

• The Mask Only option creates a black-and-white or grayscale mask from the transparent portion of the clip. This option is useful when you want to export a clip to the Adobe Photoshop program for retouching with its paint tools or when you want to separate the key channel from the image channel.

• The Smoothing option creates soft edges where color transitions occur throughout the superimposed clip. Choose from None, Low, and High.

Selecting a color to be transparent

The Chroma, RGB Difference, and Difference Matte key types define a color or range of colors as transparent based on the color you select in the color swatch in the Transparency Settings dialog box. Use one of the following methods to select a color:

• To select a color from the clip, use the slider in the Sample box to scroll through the cl until you see the color you want. Position the cursor over the desired color in the frame shown in the color swatch (the cursor changes to an eyedropper), and click the color. The selected color appears in the swatch above the color swatch.

• To select a color using the color picker, click the color swatch. The color picker appears. Select the color you want, and click OK. For instructions on using the color picker, see "Using the Premiere Color Picker" on page 141.

Adjusting the intensity of a superimposed clip

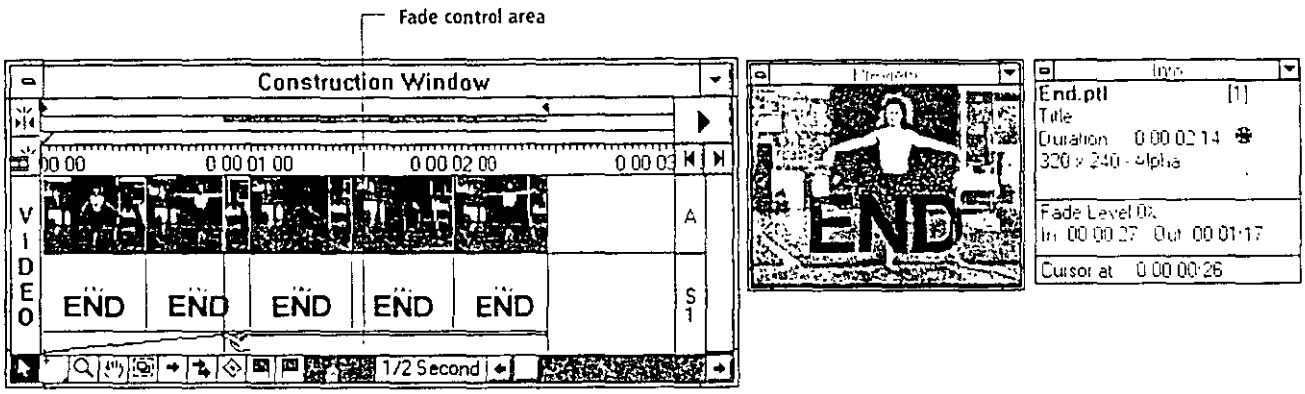
The Fade control at the bottom of the S track lets you adjust the intensity of a superimposed clip. *Fading in* makes the superimposed image more visible, while *fading out* makes the image less visible. You can also adjust the gain of the entire superimposed clip without changing any of the level adjustments you have made to the clip.

To adjust the fading:

1 Position the pointer over the top line in the Fade control panel at the bottom of the clip on the S track. The pointer changes to a pointing finger.

2 Click to create a handle (a black dot), and drag the handle up or down to adjust the fading; create as many handles as needed. When the handle is at the top of the Fade contr panel, the superimposed image is fully visible; when the handle is at the bottom of the

panel, the superimposed image is invisible. The Info window displays the Fade Level of a selected handle as a percent opaque (100 percent = opaque). To delete a handle, drag it out of the S track.

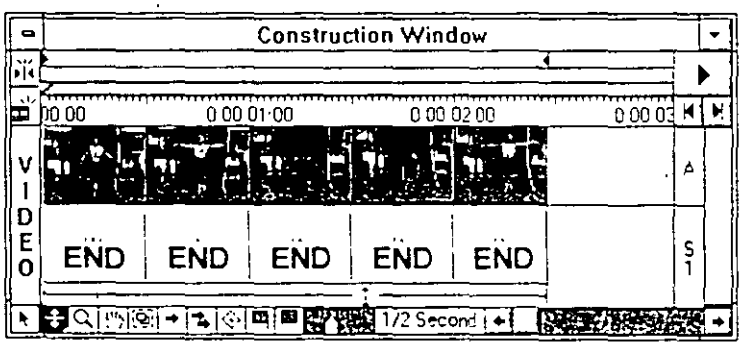


"The End" *clip fading in over* "Final Bow" *clip*

The line between two handles indicates the direction, length, and speed of the fade. The steeper the angle, the more sudden the change in intensity.

3 Adjust the opacity between two points by choosing the fade adjustment tool from the extended tools pop-up menu in the lower left corner of the Construction window and dragging the line segment up or down. When using the selection tool, you can also choose the fade adjustment tool by holding down the Shift key. The opacity of the superimposed clip can be set to a constant value by adjusting the Fade control in this manner before creating handles.

4 To make a cut in the Fade control, choose the fade scissors tool from the extended tools pop-up menu in the lower left corner of the Construction window and click the Fade control. Doing so creates two handles right next to each other. This is useful for making adjustments that sharply increase or decrease the length and speed of the fade at a point.



To adjust the gain of a superimposed clip:

1 Select the clip in the Construction window.

2 Choose Gain from the Clip menu. The Level Control Gain dialog box appears.

3 Enter a value from 1 percent to 100 percent.

4 Click OK.

Previous adjustments made to the Fade control do not change.

Adding a background matte

Adobe Premiere lets you create a full-frame matte of a solid color that can be used like a clip. This feature is useful, for example, if you want to superimpose moving titles over a solid-colored background. (For instructions on creating a background matte, see "Creating Background Color Mattes" on page 104.)

CREATING TITLES

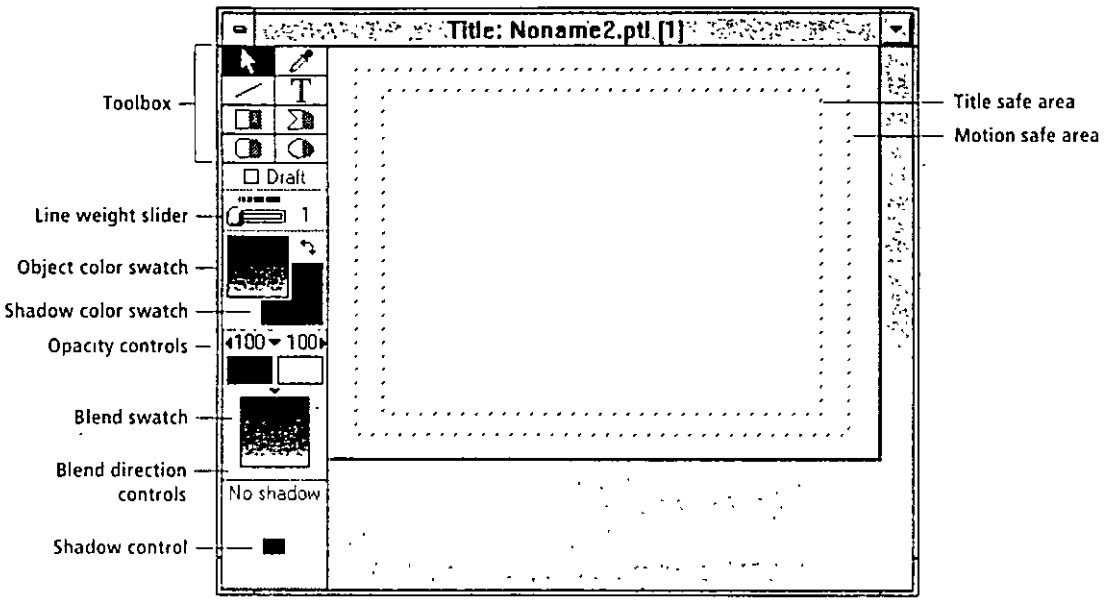
You create type and graphics in Adobe Premiere's Title window. Title clips can contain type, straight lines, and various geometric shapes. You can superimpose title clips to create titles and credits that play over other clips. Adobe Premiere automatically assigns anti-aliased alpha channels to type and graphics generated in the Title window.

When the Title window is active, the Title menu appears in the menu bar. The Title menu contains options related to type and objects drawn in the Title window. You can set additional options for the Title window by choosing Title Window Options from the Windows menu or by clicking the right mouse button on the Title window title bar.

While creating graphics in the Title window, you have the option of viewing a frame from a movie or still image as a background. You can then use the background to position titles or select colors using the eyedropper tool.

To create a title:

1 Choose New > Title from the File menu. The Title window appears, and the Title m appears in the menu bar.



2 Use the type and object tools to create the type and drawings you want in the titles. information on using these tools, see "Creating Type and Objects in the Title Window" page 195.

3 Choose Save from the File menu to save the clip.

4 Hold down the Ctrl key and drag the clip from the Title window directly into the Construction window. Alternatively, you can import saved title clips into a project by using the Import command in the File menu.

Using the Title window toolbox

The Title window toolbox contains tools and controls for creating and editing type a objects. To use a tool for a single operation, click the tool in the toolbox; to use a tool more than one operation, double-click the tool.

Title Window Toolbox

Selection tool

This tool selects an object or a block of text. Use the Shift key in conjunction with the selection tool to select multiple objects. The selection tool turns into a resize pointer when positioned over a point on a selected object.

Eyedropper tool

This tool changes settings in the Title window based on the attributes of an object or of a selected color in the background. Click any object or shadow to assign its color, transparency, and gradient fill attributes to the object color swatch Option-click any object or shadow to assign its attributes to the shadow color swatch. Click a pixel anywhere on the background to select a color from the background image.

Type tool

This tool creates type and lets you edit text.

Line tool

This tool draws straight line segments.

Rectangle tool

This tool draws rectangular shapes Click the filled (right) side of the rectangle tool to draw a filled rectangle. Click the left side of the rectangle to draw a framed rectangle.

Polygon tool

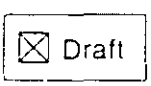
This tool draws polygons. Click the filled (right) side of the polygon tool to draw a filled polygon. Click the left side of the polygon tool to draw a framed polygon. Draw the polygon one side at a time, clicking to define the end points of each straight line segment. To complete the polygon, position the cursor over the first point and click when a small circle appears next to the cursor. You can also double-click at any point to complete the polygon.

Rounded rectangle tool

This tool draws rectangles with rounded corners. Click the filled (right) side of the rounded rectangle tool to draw a filled rounded rectangle. Click the left side of the rounded rectangle to draw a framed rounded rectangle.

Oval tool

This tool draws oval shapes. Click the filled (right) side of the oval tool to draw a filled oval. Click the left side of the oval tool to draw a framed oval.



Draft mode check box

This check box is selected if you want to work without previewing color and opacity gradients, which enables faster redrawing of type and objects in the Title window. This option does not affect the quality of the actual title clip. This option can also be selected or deselected using the accent (`) key

Kerning tools

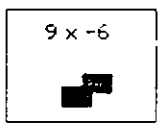
These tools (visible only in type edit mode) let you add or remove space between two characters or between multiple characters in a selected type block. Ctrl-click the kerning tools to remove any previously applied kerning.

Line weight slider

This slider (not visible when you are editing type or filled objects) lets you adjust the line weight of a framed object.

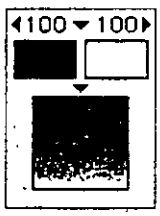
Color swatches

The object color swatch (upper left square) displays the color of the currently selected object; the shadow color swatch (lower right square) displays the color of the selected object's shadow.



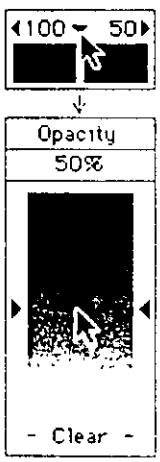
Shadow offset control

This control lets you position a shadow in relation to its object. The shape of the control reflects the type of object selected. To remove a shadow, drag it out of the control area.



Gradient controls

These controls let you create color and opacity gradients across objects and shadows. The starting and ending colors of a gradient are represented by the small color swatches. Opacity settings for the starting and ending points are posted above the respective color swatches. A preview of the gradient appears in the box below the color swatches.



Opacity sliders

These sliders pop up when you click the small black arrows above the start and end color swatches. They control the opacity for the starting and ending points of the gradient and the uniform opacity of a solid fill.

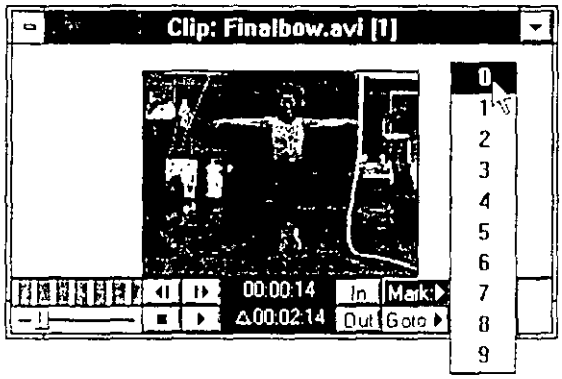
Setting up the title area

Options for setting up the drawing area of the Title window include setting the drawing size, selecting a background color, using NTSC-safe colors, and identifying the perimeter area of the Title window that may not show up on a television screen.

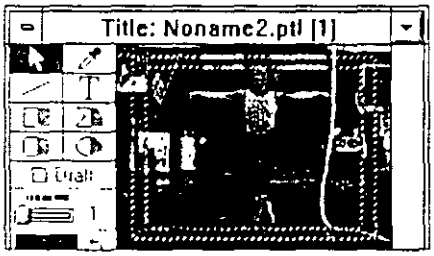
As a guide for positioning titles and graphics, you can view a frame from a movie clip in the Title window. The frame does not become part of the title clip; it is used as a positioning guide only. You can, however, use the eyedropper tool to lift colors from the displayed frame.

To use a clip frame for title positioning:

1 Set marker 0 to the frame of the clip you want displayed in the Title window. If no marker 0 is set, the in-point frame is displayed. For information on setting markers in clips, see "Setting Place Markers for Clip Alignment" on page 72.



2 Drag the clip from the Clip or Project window into the Title window. The marked frame is displayed in the Title window.



3 Remove the frame from the Title window by choosing Remove Background Clip from the Title menu.

Note: You can change the frame displayed in the Title window by setting a new marker 0 for the clip. The newly marked frame will automatically appear in the Title window.

To select options for the drawing area:

1 Make sure that the Title window is the active window.

2 Choose Title Window Options from the Windows menu or click the right mouse bu on the Title window title bar. The Title Display Options dialog box appears.

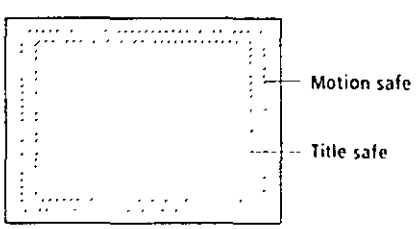
3 Enter the following settings and options:

• Drawing Size. Set the size of the drawing area from 60-by-45 pixels to 2000-by-20(pixels. In general, the size of the drawing area should be the same as the output size s the Output Options dialog box. However, this is not critical, as Adobe Premiere will s the title to match the output frame size. Note that if the 4:3 Aspect Ratio option is sele you enter just the width or height; the program updates the other dimension to mai a 4-to-3 width-to-height ratio.

• Background. Select a background color for the title clip by clicking the color swat display the color picker. (For information on selecting colors, see "Using the Premie Color Picker" on page 141.) You can also choose to make the background color opaq transparent. The default background is transparent; the background will be keyed o you apply the Alpha Channel key type. Choose Opaque from the Background settin make the background opaque.

Note: *When the Title window is active, you can set the background color to black or white the keyboard by pressing B for black or W for white.*

• Safe Title Area. Because a picture tube on a television screen is generally over-scan images may be partially truncated or lost when output to videotape. You can use the S Safe Titles option to see the area in which titles and objects are protected from partia truncation.



• NTSC Safe Colors. Select this option to restrict colors in the Title window to NTSC- colors. NTSC-safe colors are those acceptable for television reproduction, preventing oversaturated colors from bleeding across television scan lines.

Creating type and objects in the Title window

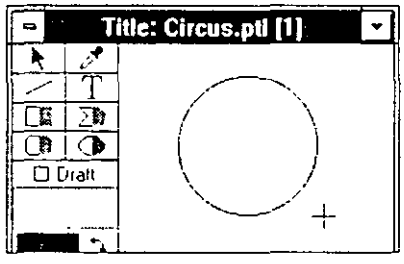
This section describes how to create type, rectangles, ovals, polygons, and straight line segments in the Title window. It also describes how to create color and opacity gradients across type and graphic objects.

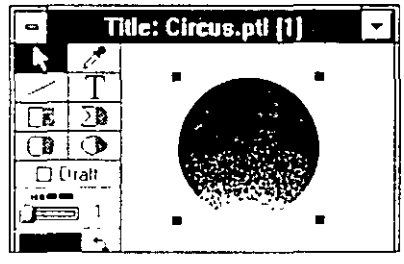
In Adobe Premiere, a geometric object is either framed or filled, but not both. You can, however, create the illusion of a framed and filled object by creating two separate objects and having the program align them for you.

The Title window enables you to create type. You can modify type using commands from the menus or tools from the toolbox. Type is treated as a filled object and cannot be converted to a framed object. You can animate type by applying motion settings to a title clip in the Construction window. For more information, see "Creating Motion" on page 166.

To create framed and filled objects:

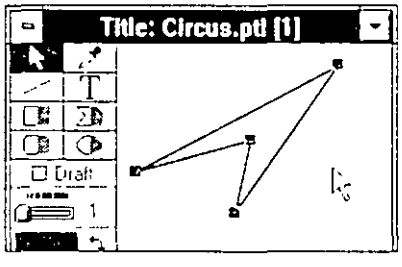
1 Create a framed or filled object using a drawing tool in the toolbox. Click a point in the Title window and drag to create a framed or filled object. Hold down the Shift key as you drag to constrain an oval to a circle, a rectangle to a square, or a line to an increment of 45 degrees.

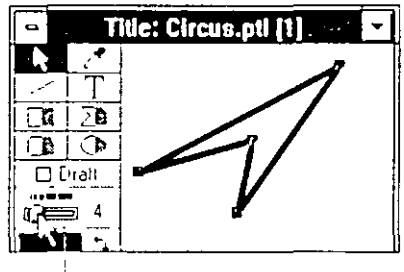




2 Click an object to select it, then use the swatches and tools in the toolbox to adjust the color, opacity, or shadow. For information on using these tools, see procedures later in this section.

3 Adjust the line width of a framed object using the Line Weight slider in the toolbox. Drag the slider to choose a line weight for an object between 1 pixel and 16 pixels.





4 To create a framed version of a filled object, select the object and choose Create Fram Object from the Title menu; to create a filled version of a framed object, choose Create Filled Object from the Title menu. Adobe Premiere makes a copy of the object, converts to a filled or framed object, and aligns it with the selected object.

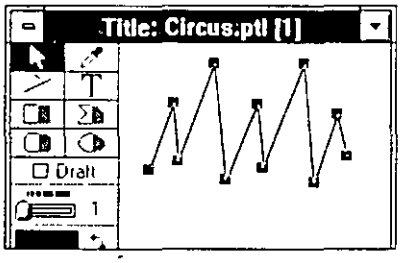
5 To convert a framed or filled object, choose Convert to Framed or Convert to Filled fro the Title menu.

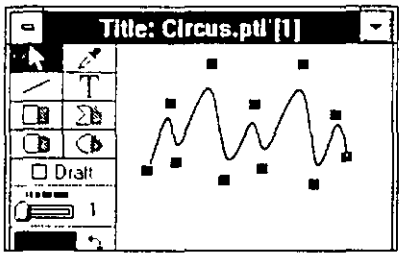
6 To resize a selected object, position the pointer tool over a point on the object and dr

7 To resize selected type, hold down the Ctrl key, position the pointer over a corner poi of the selection area, and drag. To resize type to a particular point size, use the Title me commands as described in the procedure "To adjust type attributes" on page 197.)

To smooth a polygon object:

Click an object that was created with the polygon tool, and choose Smooth Polygon fro the Title menu.





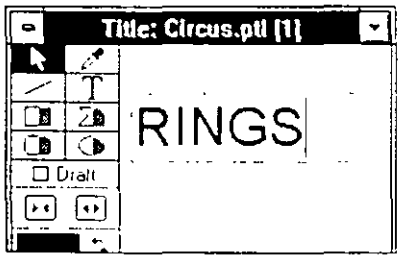
To create type:

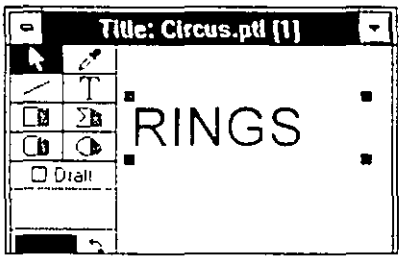
1 Select the type tool.

2 Click in the Title window where you want the type to begin, and type the desired tex You can edit type in the text entry box by selecting the type with the cursor, and then usi standard cut and paste operations.

3 Click outside the text entry box when you have finished typing.

Any color, transparency, or gradient settings in the toolbox are applied to the type. By default, newly created type has no shadow.





To adjust type attributes:

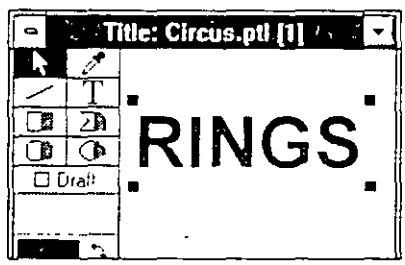
1 Select the type tool, then drag to select the type you want to adjust.

2 Choose Font from the Title menu. In the Font dialog box, change the font.

3 Use the Title menu commands to change the type style, justification, and shadow. The Title menu commands provide a variety of type styles and shadows, including an Emboss type style.

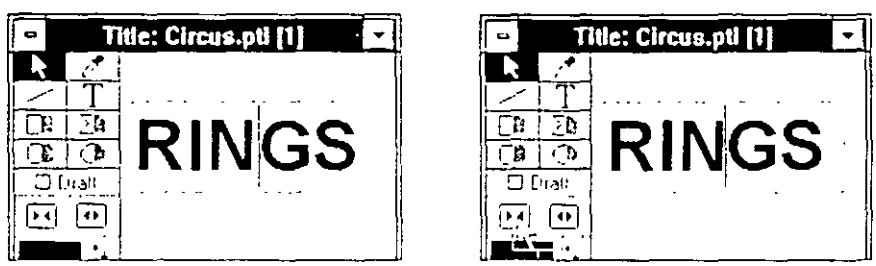
4 To change the type size, choose Size from the Title menu and select a point size.

You can hold down the Ctrl key and press the Greater Than (>) or Less Than (<) key to increase or decrease the point size in 1-point increments. You can also stretch and shrink type to change its size and aspect ratio; for more information, see the next procedure, "To stretch or shrink type."



5 To kern the type, click to position the cursor between two characters or drag to select all of the characters you want included for adjustment; then choose one of the following options:

- Click the left kerning tool to reduce spacing between characters; click the right kerning tool to increase spacing between characters.
- Hold down the Ctrl key and use the Left and Right Arrow keys to decrease and increase the space between characters.
- To reset the kerning, hold down the Ctrl key and click either kerning tool.



Kerning tools

6 To change the leading, hold down the Ctrl key and use the Up and Down Arrow keys to increase or decrease the leading in 1-pixel increments.

Note: *The selected font, type size, and type justification are applied to all type in a text block. To mix fonts, type sizes, and type justifications, you must create more than one text block.*

To stretch or shrink type:

1 Using the selection tool, select the type you want to stretch or shrink.

2 Hold down the Ctrl key and position the pointer over a corner point of the selected type. The selection tool turns into a type resize pointer.

3 Drag to stretch or shrink the selected type arbitrarily. Dragging the type also changes its aspect ratio.

To center type or objects in the drawing area:

1 Using the selection tool, select the type or object you want to center. If multiple text blocks or objects are selected, they are centered as a group.

2 To center type or objects within the drawing area, choose either Center Vertically or Center Horizontally from the Title menu.

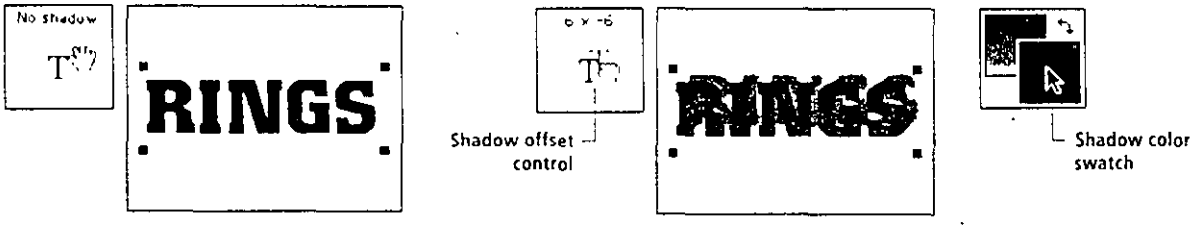
3 To center type or objects horizontally in the lower third of the drawing area, choose Position in Lower Third from the Title menu.

To create a shadow for type or for an object:

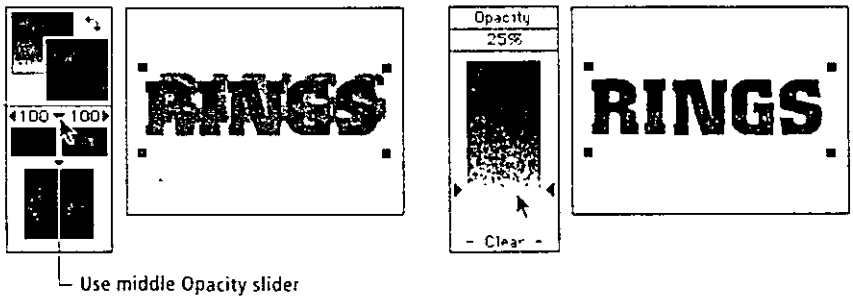
1 Select the type or object for which you want to create a shadow.

2 Drag the Shadow Offset control in the toolbox to determine the position of the shadow. Hold down the Shift key to constrain the angle of the offset to 45-degree increments. The offset coordinates, given in pixels, are displayed above the control.

3 Click the shadow color swatch in the toolbox to select a color for the shadow.



4 With the shadow color swatch selected, use the pop-up opacity sliders to adjust the transparency of the shadow.



5 Choose Shadow from the Title menu to select the Single, Solid, or Soft option for the shadow. You can also select the next shadow style by Alt+clicking the Shadow Offset control.

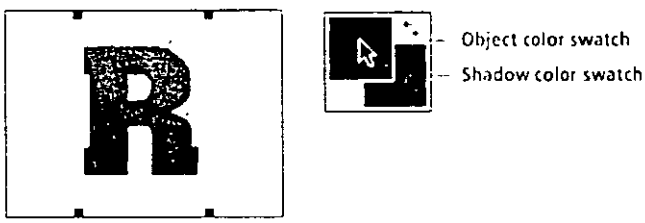
Single *Solid* *Soft*

6 To remove the shadow for a selected object, drag the shadow control into the center or outside of the control box.

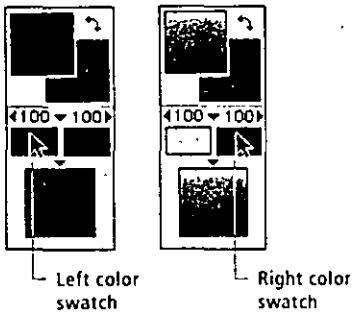
To create a gradient fill across an object or shadow:

1 Select the object you want to fill in the Title window.

2 Click the object color swatch if you want to create a gradient fill for the object; click the shadow color swatch if you want to create a gradient fill for the shadow. Click the curved arrow between the swatches to exchange the object and shadow gradients.

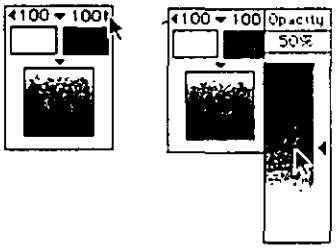


3 Select a starting color by clicking the left color swatch in the gradient controls to display the color picker. (For instructions on using the color picker see "Using the Premiere Color Picker" on page 141.) Select an ending color by clicking the right swatch in the gradient controls. A preview of the gradient appears in the box below the color swatches.



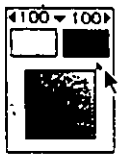
Note: *You can create a full-spectrum blend by setting the gradient starting and ending colors to the same color. To do so, drag a color from either gradient swatch to any of the other color swatches in the toolbox.*

4 Change the opacity of the starting or ending point by clicking the small black arrow above the respective color swatch and dragging the opacity slider to the desired setting. Opacity settings for the starting and ending points appear above the respective color swatches. Opacity can vary between 0 percent (clear) and 100 percent.



5 Set a common opacity for the starting and ending points of the gradient (remove the gradient) by clicking the small black triangle between the swatches and adjusting the slider control.

6 Change the direction of the gradient (in 45-degree increments) by clicking one of the eight small arrows around the preview box. The gradient starts from the location of the selected arrow.



Selecting and moving objects in the Title window

You can select and move an object in the Title window by dragging it or by using the Tab and arrow keys on the keyboard. You can also select multiple objects and move them as a group.

To select and move objects:

1 Select objects using one of the following methods:

- To select a single object, click with the selection tool.
- To select multiple objects, Shift+click with the selection tool.
- To select all objects in the Title window, choose Select All from the Edit menu.
- To select objects in front-to-back order, press the Tab key. To select objects in the opposite order, hold down the Shift key and press the Tab key.

2 Drag the object to the desired location. Press the arrow keys to move the object in 1-pixel increments in the arrow direction. Hold down the Shift key and press the arrow keys to move the object in 5-pixel increments in the arrow direction.

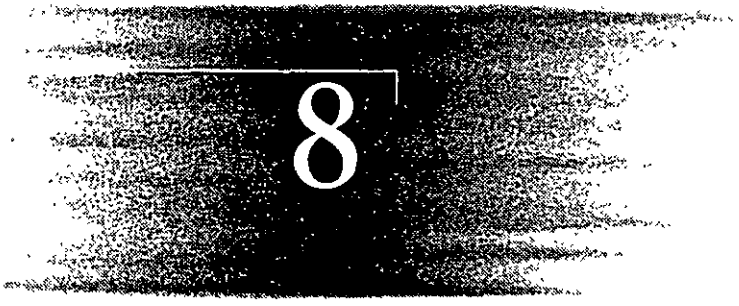
3 To center a selected object in the drawing area, choose Center Horizontally or Center Vertically from the Title menu.

4 To center a selected object horizontally in the lower third of the drawing area, choose Position in Lower Third from the Title window.

Changing the order of layered objects

By default, multiple objects in the Title window are layered in the order in which they were created. You can change the order of layered objects by selecting an object and choosing Send to Back or Bring to Front from the Title menu.

Chapter



Chapter 8: Compiling and Videotaping Movies

When you have finished assembling and editing your clips in the Construction window, you can play your movie on your computer monitor or NTSC screen, compile your movie into a self-contained Video for Windows or QuickTime movie, or output the movie to videotape.

This chapter provides information that will help you make movies of the highest quality. It explains how to compile your clips into a Video for Windows or QuickTime movie and how to use the Print to Video command to play movies and record them to videotape. It also explains how to create a movie by linking shorter movies together.

COMPILING A MOVIE

Clips in the Construction window do not become a self-contained Video for Windows or QuickTime movie until you compile them into a Video for Windows or QuickTime file using the Make Movie command.

After a movie is compiled, you can play it on your computer screen or import it into other applications that support Video for Windows or QuickTime. The quality of your finished movie depends on a number of factors, such as the type of image compression you use, the frame rate at which you output the movie, and the speed of the computer system used to play the movie.

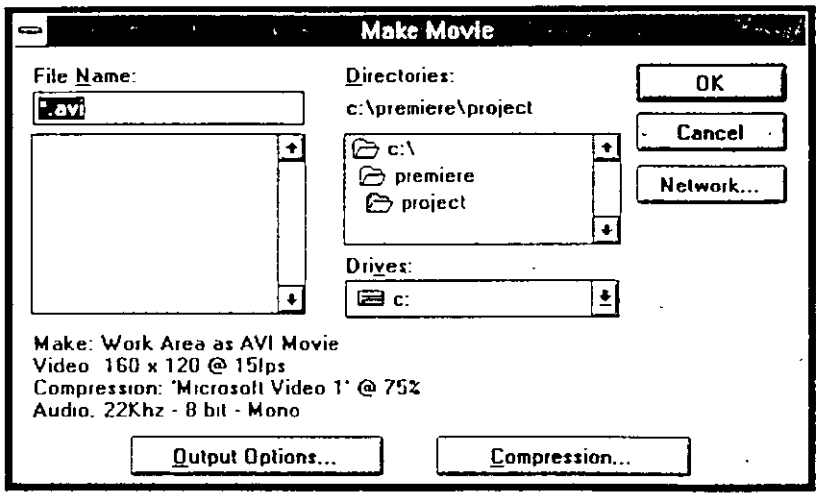
If you used the Miniatures command or Batch Capture window to create a set of smaller clips to work with while constructing your movie, you must replace the smaller clips with the original clips before compiling the movie. For information on this procedure, see "Making Miniatures to Improve Performance" on page 41.

Before compiling your movie, make sure that you have enough disk space to store it. A Video for Windows or QuickTime movie can be an extremely large file.

To compile a movie:

1 Make sure that you have enough free disk space to store the movie. If you run out of disk space as the movie compiles, you will receive an alert and will have the chance to make more disk space available or save all of the movie that has been compiled.

2 Choose Make > Make Movie from the Project menu. The Make Movie dialog box appears.



The current settings for output options and movie compression are displayed in the lower half of the dialog box.

3 To change the output options, click Output Options. The Project Output Options dialog box appears. (Output options are initially set in the project presets. The options are described in "Selecting Project Output Options" on page 205.) Adjust the output options as desired, and click OK. The Make Movie dialog box reappears.

4 To change the compression settings, click Compression. The Compression Settings dialog box appears. Compression options are described in "Selecting Compression Options" on page 214.

5 Type a name for your movie, and click OK. A progress bar appears as the movie compiles.

To stop the compilation process, press the Esc key. Adobe Premiere saves as much of the movie as has been constructed.

When compiling a movie, Adobe Premiere issues a warning if the available disk space drops below the Low Disk Space Warning Level set in the General Preferences dialog box. The warning lets you switch to the File Manager to make more space available, or to stop the process and save the portion of the movie that has been compiled so far. If you ignore the warning, you can continue compiling, but you risk running out of disk space.

If you select the Beep When Finished or the Open Finished Movie options in the Project Output Options dialog box, the program beeps or opens the movie in a Clip window when it finishes compiling and saving the movie. Play the open movie using the controls in the Clip window or by using the Print to Video command. For more information on the Print to Video command, see "Using Print to Video" on page 219.

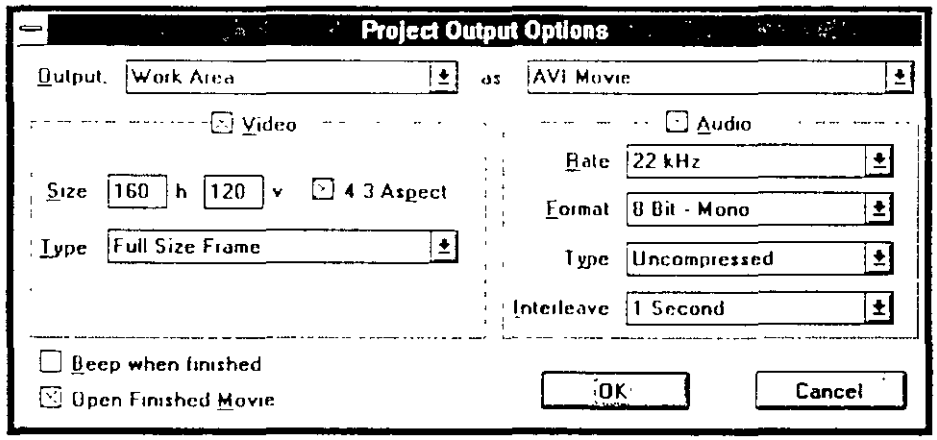
SELECTING PROJECT OUTPUT OPTIONS

The Project Output Options dialog box lets you specify how the movie is compiled. You use these options to specify the output file type, which part of the Construction window to compile, the image size, and the audio sampling rate.

Output options are initially set by the project preset, which you choose when you create the project. You probably won't need to change the project output options unless the intended use of the movie has changed. For more information on choosing a preset, see "Selecting a Project Preset" on page 28.

To set project output options:

1 Choose Output Options from the Make menu, or click Output Options in the Make Movie dialog box. The Project Output Options dialog box appears.



2 From the Output drop-down list, select which part of the Construction window to compile: Entire Project to compile everything in the Construction window, or Work Area to compile only the segment under the yellow work area bar.

3 Select the output file type from the drop-down list in the upper-right corner of the dialog box. For more information, see the next section, "Selecting the Output File Type."

4 Specify video output options in the left side of the dialog box. For more information, see "Selecting Output Options for Video" on page 207.

5 Specify audio output options in the right side of the dialog box. For more information, see "Selecting Output Options for Audio" on page 209.

6 Click OK.

Selecting the output file type

You can choose from seven output file types in the Output As list.

AVI Movie

The AVI Movie option generates a movie file in the Microsoft Video for Windows *.avi* file format, which is compatible with any software that supports this format.

QuickTime Movie

The QuickTime Movie option generates a movie file in the QuickTime for Windows *.mov* file format, which is compatible with any software that supports this format.

Filmstrip File

The Filmstrip File option generates a Filmstrip format file that can be opened and modified in Adobe Photoshop. The file you open in Adobe Photoshop is a single file containing all the frames of the movie. Filmstrip files are uncompressed and may require large amounts of disk space. For more information on Filmstrip files, see "Modifying Filmstrips in Adobe Photoshop" on page 106.

Autodesk FLC/FLI

The Autodesk FLC/FLI option generates an Autodesk Animator (*.flc* or *.fli*) file. The Animator file is a single file containing all the frames of the movie, which can be opened in any animation application that supports this file format.

Bitmap Sequence

The Bitmap Sequence option generates a series of bitmapped (*.bmp*) files, one for each frame of the final movie. The files are numbered sequentially beginning with the number 01, which is appended to the filename (for example, *file01.bmp*, *file02.bmp*, and so on). Numbered bitmapped files can be imported into other applications that may be unable to accept Video for Windows or QuickTime movies.

Targa Sequence

The Targa Sequence option generates a series of Targa (*.tga*) files, one for each frame of the final movie. The files are numbered sequentially, beginning with the number 01, which is appended to the filename (for example, *file01.tga*, *file02.tga*, and so on).

TIFF Sequence

The TIFF Sequence option generates a series of TIFF (*.tif*) files, one for each frame of the final movie. The files are numbered sequentially beginning with the number 01, which is appended to the filename (for example, *file01.tif*, *file02.tif*, and so on).

Selecting output options for video

The Project Output Options dialog box lets you specify the dimensions of the movie frames when output and how the fields are captured.

Size

The Size fields determine the height and width (in pixels) of the movie frames when output. If the 4:3 Aspect Ratio option is selected, you enter only the height or width and the other field is updated automatically. Note that larger images usually result in reduced playback rates if you don't have a board with hardware compression. With larger images you may not achieve normal playing speed when playing the movie on your computer or recording it on videotape. Increasing output size also increases the file size of the final movie. The aspect ratio of the Preview window is automatically determined by the proportions of the video output frame.

4:3 Aspect Ratio

By default, the dimensions of the movie frames are constrained to the standard analog video width-to-height ratio, or *aspect ratio*, of 4 to 3 (width = 4; height = 3). If your original clips were captured from analog video, changing the 4:3 aspect ratio will distort the image; or if the movie is later played on analog video, changing this ratio will cause the analog video image to be distorted.

Type

This setting should match the way your video display board processes NTSC or PAL video. Leave this setting at Full Size Frame if your board does not process the separate fields in an NTSC video frame. If your board processes full-frame, 60-field video, select the proper field dominance for the board, either Field 1 or Field 2. For more information about field 1 and field 2 dominance, see the next section, "Full Field Processing of Clips."

If your clips were captured with different capture boards, your project may contain some clips with field 1 dominance and some with field 2 dominance.

Full-field processing of clips

Field processing is an issue when you're working with full-frame (640-by-480 pixels), 60-field NTSC or 50-field PAL video. You should specify how Premiere processes the fields for a specific clip when you're changing the speed of a clip, exporting a filmstrip, or freezing on a video frame.

Each frame of NTSC video contains two fields, one containing odd scan lines and the other containing even scan lines. Most NTSC video is *field 1 dominant*. This means that the odd field precedes the even field in the designation of the video frame. If the fields are reversed, motion can appear jerky. Some video capture boards can capture with field 1 or field 2 dominance. Others assume field 1 dominance.

To set field processing options for a clip:

1 Select the clip in the Construction window.

2 Choose Field Options from the Clip menu.

3 Set options for field processing as described in the following sections, and then click OK.

Reverse Field Dominance option

This option reverses the field dominance of a clip so that it matches the field dominance used by your video board, and is useful if your clips weren't all digitized by the same capture board. All clips in a movie should have the same field dominance.

None option

This option turns off interlacing.

Interlace Consecutive Frames option

This option converts consecutive frames into interlaced fields of video. Many animation applications don't consider video fields. For smooth animations, use this setting to convert 60 fps animations into 30 fps animations with two fields per video frame.

Always Deinterlace option

This option converts the interlaced fields into frames of video with no discernible fields. The video frames are generated from an average of the field data, resulting in no interlacing or time offset. You should select this option if you are working with a freeze frame.

Flicker Removal option

This option eliminates the flickering of thin horizontal lines. When this option is not selected, a horizontal line of 1 pixel appears in only one of the two video fields, which results in flickering during playback. Selecting this option blends each line with a percentage of the lines above and below it so that a 1-pixel high line appears in both video fields.

Deinterlace Fields When Speed is Below 100% option

This option converts the interlaced fields into frames of video with no discernible fields when the speed of a clip is reduced. This option is selected by default.

Selecting output options for audio

The Project Output Options dialog box includes the three options for the audio portion of the movie:

Rate option

This option determines the sampling rate for the audio clips. The highest frequency that you can achieve in the final audio output is equal to half of the sampling rate; for example, a 44 kHz sample rate is capable of producing a 22 kHz frequency. Compact disc (CD) audio is sampled at a 44 kHz rate.

The Format option

This option sets the audio output to 8-bit or 16-bit mono or stereo resolution format.

The Type option

This option lets you choose whether to compress the audio. Choose None to leave audio uncompressed. Choose IMA ADPCM or MS-ADPCM to compress audio using a 4:1 lossless compression scheme. Compressing audio allows you to have higher-quality audio without reducing the movie's frame rate. Most sound cards can uncompress audio while playing a movie. If your sound card supplies additional audio compressors, they will appear in the Type drop-down list.

The Interleave option

You can set the amount of audio to be stored in the movie between blocks of video, called interleaving audio and video. You can specify amounts in frames, seconds, or minutes. In most cases, the default amount (1 second) works best, but if you notice delays in your movie and choppy audio, you may want to experiment with different amounts. For movies that will be played from CD-ROM, choose 1 frame.

Note: *For the smoothest playback, you can load all of the audio into RAM first, which allows the video frames to be retrieved from the hard disk without interruption. To load all the audio into RAM first, choose a value for the Interleave field that is longer than the duration of the entire movie. For this method to work properly, you must have enough RAM available to load the entire audio portion of the movie and the audio portion must be five minutes or less in duration.*

DIGITAL VIDEO COMPRESSION

Compression is the process of removing or restructuring data to decrease the size of a file. Digital video files are very large, requiring high data transfer rates for capture and playback. As you compile a Video for Windows or QuickTime file, you compress the data to reduce the file size and facilitate the playback of the movie. Data decompression takes place as the movie plays back. Compression and decompression are critical if the movie is to play off a CD-ROM drive or play at full size from a hard drive.

Several compression/decompression algorithms (*codecs*) are available for compressing Video for Windows and QuickTime movies. Codecs can be software-based or hardware-based. Hardware compression is significantly faster and more effective than software compression. The codec you choose affects the visual quality of the movie and the speed with which it plays on your computer monitor or NTSC screen. In general, full-frame, 24-bit video images can only be played back in real time (that is, at normal playing speed) using hardware compression and decompression. Video for CD-ROM is normally compressed with software codecs because it allows anyone with a CD-ROM player to view movies without specialized hardware.

You can compress Video for Windows movies in Adobe Premiere using any of the software codecs that come with Video for Windows. You can also add third-party codecs to your system to give you a variety of compression formats from which to choose. Some codecs are optimized for image quality compression, while others are optimized for speed. For more information, see "Video for Windows Software Compressors" on page 212.

You can compress QuickTime movies in Adobe Premiere using any of the QuickTime software codecs that come with Adobe Premiere. For more information, see "QuickTime Software Compressors" on page 213.

Several third-party video boards offer hardware compression based on the Motion JPEG (Joint Photographic Experts Group) format. Motion JPEG allows display of full-frame images at 30 frames per second, and with some boards, 60 fields per second. For more information on third-party hardware, see the *readme* file shipped with Adobe Premiere.

Outputting full-screen images

You can output full-screen images (640-by-480 pixels) to your computer screen or to videotape in real time (at the normal playing speed of 30 fps), only if your playback system has hardware compression. You can record full-screen images to videotape in nonreal time (below normal playing speed) using software compression if you have a controllable tape deck. You can output half-screen images (320-by-240 pixels) at full frame (640-by-480 pixels) to your computer screen or to videotape using the Zoom Screen feature of the Print to Video command, with either hardware or software compression. For more information on printing to video, see "Using Print to Video" on page 219. For more information on outputting to videotape, see "Outputting a Movie to Videotape" on page 222.

Note: *You can have Adobe Premiere generate an Edit Decision List (EDL) for creating a videotape using traditional post-production techniques. The EDL contains a list of all of the clips, transitions, and special effects in the movie, and is used to assemble a new movie (master) from the original (source) tapes. For more information on EDLs, see "Generating an Edit Decision List" on page 108.*

Achieving the highest possible playback rate

The playback rate of your movie determines how smooth and natural-looking the mo appears. At playback rates below 15 fps, you notice the frames that make up a movie; the lower the playback rate, the more distinct each frame becomes, until the illusion of continuous motion is lost completely. Higher playback rates give the illusion of continuous motion; the individual frames are undetectable. For best results, you want the highest possible playback rate (up to 30 frames/60 fields per second).

The highest playback rates are achieved with fast hard drives and video boards capable of processing data to the screen very quickly. Hardware compression (such as Motion JPEG compression) yields the best results. In many cases, however, the playback computer will not be able to display 30 fps, especially if your movie is distributed on CD-ROM. For more information about playback on CD-ROM, see "Making Movies for Playback on CD-ROM" on page 218.

Data compression schemes

Codecs use several schemes for removing or restructuring data to decrease the size of a file. *Lossless* compression schemes preserve the original data, ensuring that the image is the same after compression and decompression. Most lossless schemes use *run-length encoding*, a process that discards continuous regions of duplicate colors. This techniq works very well for images that are generated electronically where colored areas are often

composed of solid colors. In general, however, lossless compression is not very effective with digitized video and scanned photographs because colors in these images are usually represented by high dithering and diffusion and contain few areas of continuous color.

Lossy compression schemes, on the other hand, attempt to remove picture information that viewers are not likely to notice. Lossy compressors do not preserve original data; image information is lost and cannot be recovered. The amount of data that is lost depends on the degree of compression, controlled by the image quality setting in the Compression Settings dialog box. A high Quality setting for a movie results in much less information being lost than with a low Quality setting. In addition, many lossy compressors result in additive loss—as the images are recompressed, even more data is lost. Additive loss varies with the compressor; the QuickTime Video codec, for example, has been designed to have little additive loss when recompressing.

Spatial compression compresses the data in each frame of a clip, while *temporal compression* compresses the data by comparing frames over time. Common side-effects of spatial compression include blurring, blockiness (small blocks of constant color instead of the random dithering found in the original content), streaking (lines of constant color), and contouring (regions of constant color).

Frame differencing is a type of temporal compression that minimizes the amount of data required to represent each frame in a clip by storing data for only the frames that contain changes. This type of compression works well when a movie contains a small amount of movement and thus contains a fair amount of duplication from one frame to the next. Frame differencing schemes store the data from certain key frames and discard other data. A common side-effect of frame differencing is blockiness in the video images.

Video for Windows software compressors

The following software codecs are shipped with Video for Windows and appear in the Compressor drop-down list in the Compression Settings dialog box. Additional third-party codecs, such as Motion JPEG, appear if you are using a video capture board that has hardware compression.

Microsoft Video 1 codec

Use the Video 1 option for compressing analog video. The Video 1 compressor is a lossy, spatial compressor that supports pixel depths of 8 or 16 bits.

Microsoft RLE codec

Use the RLE option for compressing animation and computer-synthesized images. The RLE compressor is a spatial 8-bit compressor that uses run-length encoding techniques.

Cinepak codec

Use the Cinepak codec when compressing 24-bit video for playback from CD-ROM discs. This codec attains higher compression ratios, better image quality, and faster playback speeds than the Microsoft Video 1 codec. It is available on both Windows and Macintosh computers. For best results, use the Cinepak codec on raw source data that has not been previously compressed with a highly lossy compressor. Cinepak is a highly asymmetric codec, which means that decompression is much faster than compression. You can set the data rate for playback (see "Selecting Compression Options" on page 214).

Intel Indeo Video R3.2 codec

Use the Indeo Video option when compressing 24-bit video for playback from CD-ROM discs. This codec attains higher compression ratios, better image quality, and faster playback speeds than the Microsoft Video 1 codec. It is available on both Windows and Macintosh computers. For best results, use the Indeo Video codec on raw source data that has not been previously compressed with a highly lossy compressor. When used with a data rate for playback, this codec produces movies that are comparable in quality to those compressed with the Cinepak codec. For more information on setting the data rate, see "Selecting Compression Options" on page 214.

Intel Indeo Video Raw codec

Use the Intel Indeo Video Raw option for capturing uncompressed video. This option provides excellent image quality, because no compression is applied. Captured video files are smaller than those captured with the None option.

None option

Use the None option for real-time acquisition of analog video. This option provides excellent image quality, because no compression is applied. Data can be compressed later or recomputed for playback from CD-ROM. The disadvantage of using the None compression option is that large amounts of disk space are required, and the video cannot be played back.

QuickTime software compressors

The following QuickTime for Windows codecs are shipped with Adobe Premiere and appear in the Compressor drop-down list in the Compression Settings dialog box (for more information, see "Selecting Compression Options" on page 214). Choose a codec based on the type of original images you have and your desired results. If your video board provides hardware compression, refer to the video board documentation for recommendations about which codec to choose.

Cinepak codec

Use the Cinepak codec when compressing 24-bit video for playback from CD-ROM discs. This codec attains higher compression ratios, better image quality, and faster playback speeds than the Video codec. It is available on both Windows and Macintosh computers. For best results, use the Cinepak codec on raw source data that has not been previously compressed with a highly lossy compressor. With Cinepak, decompression is much faster than compression. You can set the data rate for playback (see "Selecting Compression Options" on page 214).

Intel Indeo Video R3.2 codec

Use the Indeo Video option when compressing 24-bit video for playback from CD-ROM discs. This codec attains higher compression ratios, better image quality, and faster playback speeds than the Video codec. It is available on both Windows and Macintosh computers. For best results, use the Indeo Video codec on raw source data that has not been previously compressed with a highly lossy compressor. When used with a data rate for playback, this codec produces movies that are comparable in quality to those compressed with the Cinepak codec. For more information on setting the data rate, see "Selecting Compression Options" on page 214.

Video codec

Use the Video codec for the capture and compression of analog video, high-quality playback from hard disk, and moderate quality playback from CD-ROM. This codec supports both spatial and temporal compression of 16-bit video and can play back at rates of 10 fps or more. Data can be recompressed or recompiled later for higher compression ratios. The Video codec allows recompression with minimal or no quality degradation.

None option

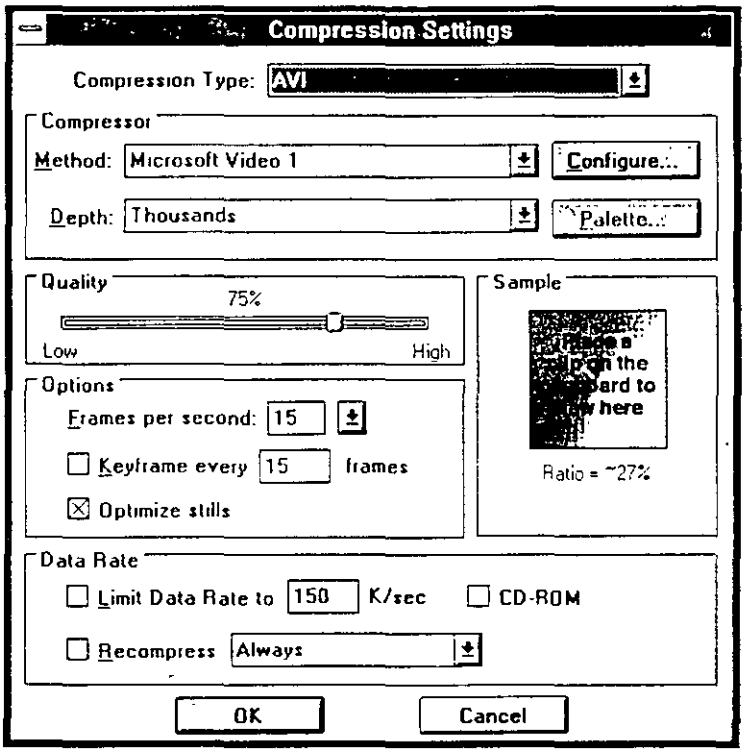
Use the None option for real-time acquisition of analog video. This option provides excellent image quality because no compression is applied. Data can be compressed later or recomputed for playback from CD-ROM. The disadvantage of using the None compression option is that large amounts of disk space are required.

SELECTING COMPRESSION OPTIONS

Compression options are initially set by the project preset, which you choose when you create the project. You probably won't need to change the compression options unless the intended use of the movie has changed. For more information on choosing a preset, see "Selecting a Project Preset" on page 28.

To change compression settings:

1 Choose Compression from the Make menu, or click Compression in the Make Movie dialog box. The Compression Settings dialog box appears.



2 To see how the compression settings will affect your compiled movie, copy a clip from your project to the Clipboard. A frame from the clip appears in the Compression Settings sample box. The frame display is a snapshot preview of the compiled movie.

3 Select which codec to use in compiling your movie. If your board provides hardware compression, select the proper Motion JPEG codec. Otherwise, select a software codec. For more information, see "Video for Windows Software Compressors" on page 212 and "QuickTime Software Compressors" on page 213.

4 If your compressor allows you to set compression quality options, click Configure and set those options.

5 Select a pixel depth for the movie from the Depth drop-down list.The pixel depth determines the number of colors that can appear in the images. Smaller depths can reduce the file size but may degrade the image quality. Some codecs, such as the Cinepak codec, have a fixed pixel depth that cannot be changed.

6 If you are limiting a movie to 256 colors, click Palette and select a movie palette. Select the Calculate a New Palette option to have Adobe Premiere calculate a palette for each movie. Select the Load Palette Now option to load a palette you have previously created.

7 Use the Quality slider to set the spatial compression quality. The lower the Quality setting, the more the movie is compressed and the smaller the file size. A high Quality setting results in less information being lost than with a low Quality setting. To preview the effect of spatial compression on your movie, place a sample image in the box above the Quality slider, as described in Step 2. For more information on spatial compression, see "Data Compression Schemes" on page 211.

8 Set the compression options, as described in the following sections.

9 Click OK when you have finished specifying the compression.

Frames per Second option

This option specifies the maximum playback rate of the movie in frames per second (fps). Choose a rate from 1 fps to 30 fps from the drop-down list (30 fps is the maximum rate for playback on a PC). In general, higher rates yield better results, with smoother, more natural-looking motion. However, you should select a rate that matches the maximum playback rate of the computer system on which you intend to run the finished movie. Selecting a rate that cannot be achieved by the playback system will result in dropped frames and possible flutter when you play your movie. The maximum rate of the playback system depends on the speed of its components: the CPU, the hard drive, and the display card. For more information on playback rates, see "Achieving the Highest Possible Playback Rate" on page 211.

Note: *Setting the playback rate higher than the rate of the original clips will replicate frames; it does not increase the rate of the original clips.*

Key Frame option

This option is available if you have selected a codec that uses frame differencing, which is a type of temporal compression. (For more information on frame differencing, see "Data Compression Schemes" on page 211.) A *key frame* is the baseline frame against which other frames are compared for differences. The key frames are saved in their entirety, while intervening frames, called *delta frames*, are compressed based on their differences from the key frames. The Key Frame option specifies the rate at which the movie is sampled for key frames. Using the Key Frame option allows for greater compression and increased playback speed, but can delay access of individual frames in a movie.

As a general rule, you should set the Key Frame option to the recommended rate for the codec, which will automatically appear in the Key Frame text box. Otherwise, set the Key Frame option to one key frame per second. For example, if the playback rate of your movie is 10 fps, you should set the Key Frame option to 10 so that the movie is sampled for a key frame every 10 frames. If you do not select the Key Frame option, the compressor treats every frame as a key frame.

Optimize Stills option

This option, which is selected by default, optimizes still images that extend more than one frame. When this option is selected, only the first frame of the still image is compressed.

Data Rate option

This option is available you are using certain compressors, such as Cinepak and Indeo, for CD-ROM playback. For playback on a single-speed CD-ROM drive, set the data rate limit in the range of 90K to 100K per second. For playback on a double-speed CD-ROM drive, set the rate as high as 150K to 200K per second. For playback on a triple-speed CD-ROM drive, set the rate as high as 300K per second. Adobe Premiere automatically adjusts the spatial and temporal quality of the movie to achieve the data rate you specify. To examine the data rate of a Video for Windows clip or movie, choose Tools > Movie Analysis from the File menu to see a graph of the data rate over time.

CD-ROM option

This option pads frames to evenly fill the 2K blocks, or sectors, on a CD. Many CD-ROM drives play unevenly if a movie does not maintain an even data rate.

Recompress option

This option is available when you are using certain codecs, such as Cinepak and Indeo. You can use this option to control when compression is applied. Select Always to always recompress all clips. Select Maintain Data Rate and provide a tolerance to allow some spikes in the data rate. Video clips often have small spikes in the data rate, particularly at the beginning of the clip, that do not degrade the performance. Using the Maintain Data Rate option allows those spikes to remain.

When Adobe Premiere compiles a movie or builds a preview, all of the clips are processed using the same compression, frame rate, and other output settings. If you are using clips that have already been compressed and that already have the same output settings as the final movie, you generally want to avoid recompressing those clips. For example, you may be using source clips from a CD-ROM or clips that were captured using the same cod

and output settings as your final movie. You want to avoid recompression because it degrades the image quality of the clip and because it can take a long time, particularly if you are using the Cinepak or Indeo codecs.

By default, Adobe Premiere will not recompress a clip if the project's compression options and output options are set to the same values as those of the source clip and if no special effects have been applied to the clips. To prevent recompression, the project and the source clip must have the same settings for all of the following:

- frame size
- frame rate
- key frame rate
- codec
- color depth

New material, such as effects, will be always recompressed, as will any clips whose settings are not the same as the project output and preview settings. To control recompression, you can use the Limit Data Rate and the Recompress options.

MAKING MOVIES FOR PLAYBACK ON CD-ROM

CD-ROM drives process data relatively slowly—in the range of 90K to 250K per second, depending on the speed of the drive. At this limited transfer rate, data compression is critical. The quality of your final movies depends on the way you capture the video and process the digitized clips.

Current data transfer rates for CD-ROM effectively limit the movie size to 320-by-240 pixels. Higher frame rates are achieved with a size of 240-by-180 pixels. You should capture at 30 fps (or at the highest rate possible) using the final movie frame size. If your hardware allows, you can capture at larger sizes and resize the movie in Premiere, but improvements in the final image quality may be imperceptible, and working with larger images substantially increases compiling time and the amount of disk space required to store the data.

Always start with the cleanest analog video source available when you capture movies, as video noise increases the amount of data that must be compressed. When capturing, use hardware compression if it is available, and keep your digitized clips at the highest possible quality until you are ready to compile your final movie. After building your movie in Adobe Premiere, compile it using the Cinepak or Indeo compressor. These compressors

allow you to limit the data rate for the movie. In addition, because these software compressors are available on both the Macintosh and the PC, movies compressed using these codecs can be played back on both platforms.

For best results when making movies for playback on a CD-ROM, use the following settings in the Compression Settings and Project Output Options dialog boxes. (Some of these settings are used automatically if you have selected the project preset for CD-ROM mastering.)

- Output As: Video for Windows (*.avi*) or QuickTime Movie
- Size: 240-by-180 pixels
- Rate: 15 fps
- Audio Rate: 11 kHz sound rate
- Compressor: Cinepak or Indeo
- Key Frame: selected and set to the automatically recommended key frame rate
- Quality (Temporal): Normal
- Recompression: Compress if the data rate exceeds the requested rate
- Interleave: 1 fps
- Data Rate: 90K/second for single-speed drives; 150K/second to 200K/second for double-speed drives; 300K/second for triple-speed drives
- CD-ROM: selected

USING PRINT TO VIDEO

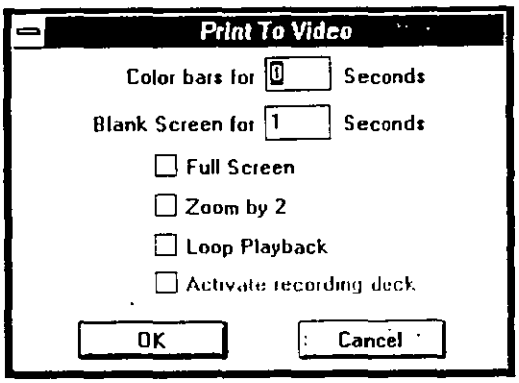
Adobe Premiere's Print to Video feature lets you export a movie from the Clip window to your computer screen or video monitor while blacking out all other windows. The Print to Video command is useful for viewing compiled movies and for recording movies onto videotape in real time as they play on your screen. Print to Video lets you perform hardware zooming as you play a clip, so that you can view a quarter-screen movie at full-screen size. For information on making videotapes, see "Outputting a Movie to Videotape" on page 222.

To play a movie centered on a blank screen:

1 Choose Open from the File menu. The Open dialog box appears.

2 Select the movie you want to play from the file list, and click OK. The movie appea. .n a Clip window.

3 Choose Export > Print to Video from the File menu. The Print to Video dialog box appears.



4 In the Color Bars text box, set the duration for displaying color bars at the beginning of the movie. The default setting is 0 seconds.

5 In the Blank Screen text box, set the duration of the blank screen displayed at the beginning and end of the movie. The default setting is 1 second. This setting works well if you are using Print to Video to view the movie. For recording on videotape, you should set the duration of the blank screen to about 15 seconds.

6 As an option, select Full Screen to play the movie at the full size of the screen.

7 As an option, select Zoom by 2 to magnify the frame size of the movie by a factor of two. This is an effective way of enlarging quarter-screen movies (320-by-240 pixels) to full size (640-by-480 pixels). The speed with which you can zoom with software is determined by the hardware you have.

Note: *Because every pixel is mapped to four screen pixels when the movie is magnified, zooming may cause noticeable pixelization or blockiness in the image. If the movie is output to tape, encoding will reduce some of this blockiness.*

8 As an option, select Loop Playback to play the movie as a continuous loop. Press the Esc key to cancel continuous playback.

9 As an option, select Activate Recording Deck if you are recording to a controllable device. The movie will be recorded to the tape deck that you have selected in the Device Control dialog box under the Preferences menu. This option is grayed out if no such device is selected. (For a description of these options, see "Outputting a Movie to Videotape" on page 222.) Do not select the Activate Recording Deck option unless you want to record the movie onto a controllable device as it plays on your screen.

10 Click OK. The movie plays at full screen or in the center of the screen against a black background, depending on the frame size. To interrupt the playing of the movie, press the Esc key.

LINKING MOVIES

You can link a series of short movies using the Sequence window. The Sequence window is simpler to use than the Construction window and is good for storyboarding or producing quick results with existing clips. When you compile a movie using the Sequence window, additional compression is not applied.

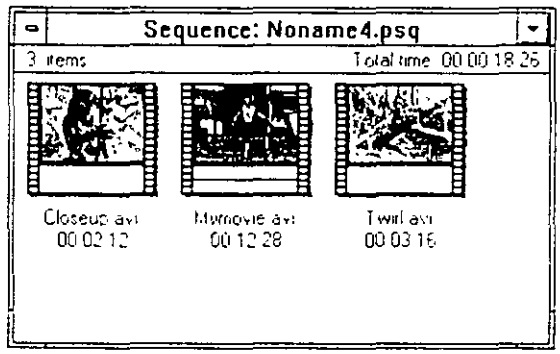
You can use the Print to Video command when the Sequence window is active to output the contents of the window directly to your computer screen or to videotape.

To make a linked movie using the Sequence window:

1 Choose New > Sequence from the File menu. The Sequence window opens.

2 Use the Import command in the File menu to import the movies you want in the composite movie. You can also drag movies from a Clip window or the Project window into the Sequence window.

The thumbnails of the movies you selected appear in the Sequence window. The area under the title bar of the Sequence window displays the number of movies in the window and the total duration of the combined movies.



3 To change the order in which the movies are linked, drag the thumbnails to rearrange them in the Sequence window. Press the Shift key to select and move more than one thumbnail at a time.

4 Choose Make Movie from the Make menu. The Make Movie dialog box appears.

5 Type a name for the movie, and click OK.

Adobe Premiere begins creating the linked movie. To stop the compilation, press the Esc key.

To display a sequence using Print to Video:

1 With the Sequence window active, choose Export > Print to Video from the File men

2 Choose options from the Print to Video dialog box. For a description of these option see "Using Print to Video" on page 219.

3 Click OK.

Movie, audio, and still-image clips play in the center of your screen, in the order that th appear in the Sequence window.

To save a Sequence window:

1 With the Sequence window active, choose Save from the File menu. The Save File dial box appears.

2 Type a name for the Sequence file, and click OK.

Note that the Sequence file contains only a reference to the movies used to build the composite movie; therefore, the file size is very small.

OUTPUTTING A MOVIE TO VIDEOTAPE

You can record an Adobe Premiere movie or movie sequence to videotape using the Pri to Video command. You need a scan converter and an NTSC or PAL encoder to convert the RGB signal to an NTSC or PAL signal. You can use external devices or the converter and encoder that are built-in on some video boards. You need only one tape deck for recording a movie; time base correctors, switchers, effects generators, and other special equipment are not needed. After the movie is output to videotape, you can play the tap on any television or analog video monitor equipped with a videotape deck.

You can record Adobe Premiere movies after they have been compiled. You can use the Print to Video command to view the movie on your computer monitor before activatin your recording deck. This provides you with a preview of what the movie should look lik on videotape. For more information, see "Using Print to Video" on page 219.

You can videotape the movie in real time as it plays on your screen, or in nonreal time i you have a controllable frame-accurate recording deck. To achieve acceptable results wit real-time recording you need a computer and video display board that is capable of producing an acceptable output rate. If your movie skips frames when it plays on your monitor, those frames will be lost in real-time recording.

Nonreal-time recording means recording at a speed other than the movie's normal playin speed. The advantage of nonreal-time recording is that you are assured of capturing ever frame of your movie on videotape. However, you need a controllable recording deck an

a machine controller, such as an ARTI or V-LAN controller. In addition, you need a third-party software program that allows nonreal-time frame grabbing and printing to videotape.

Before outputting to video, you should use the Print to Video command to view at least a portion of the movie on your monitor before you activate your recording deck. (For more information, see "Using Print to Video" on page 219.) If you will be recording in real time, this provides you with a preview of what the movie should look like on videotape.

Note: *You can have Adobe Premiere generate an Edit Decision List (EDL) for creating a videotape using traditional post-production techniques. The EDL contains a list of all of the clips, transitions, and special effects in the movie, and is used to assemble a new movie (master) from the original (source) tapes. For more information on EDLs, see "Generating an Edit Decision List" on page 108.*

To output a movie to videotape:

1 Make sure that your computer is capable of producing NTSC-compatible signals. (For more information, see the next section, "Producing NTSC-Compatible Signals.")

2 Make sure that you have a cable connection from the NTSC encoder (or from your v o board if the board has a built-in encoder) to your tape deck. If you have an NTSC monitor, you should have a cable connecting the encoder output to the monitor input and another cable connecting the NTSC monitor output to the tape deck input.

3 Select one of the following sources for the movie you want to record:

- The Clip window, for compiled movies
- The Sequence window, for linked movies

4 If you have a controllable device and want Adobe Premiere to start and stop the tape automatically, select Preferences > Device Control from the File menu and choose the controllable device you are using from the drop-down list in the Device Control dialog box.

5 Choose Export > Print to Video from the File menu. The Print to Video dialog box appears.

Note: *Some video board manufacturers supply enhanced export modules for Adobe Premiere. These export modules support features unique to the board. Like Adobe Premiere's built-in Print to Video module, these third-party export modules are implemented by choosing " command in the Export menu. Refer to the documentation that comes with your video d for more information.*

6 Select Print to Video options. For a description of these options, see "Using Print to Video" on page 219.

7 Click OK.

8 If you are recording in real time without a controllable deck, press Record on your tape deck. A Blank Screen setting of 15 seconds in the Print to Video dialog box should allow you enough time to activate the deck and get it up to speed before the movie starts playing.

The movie begins recording to the videotape on the tape deck. If you are using a controllable deck, the deck stops after the movie has been recorded. If you are not using a controllable deck, you must manually stop the deck.

Producing NTSC-compatible signals

To videotape an Adobe Premiere movie, your hardware must be set up to produce NTSC scan rates and encode the video signal for NTSC display. The ability of your computer to perform these two tasks depends on the capabilities of your computer and your video board. Some video boards have both capabilities and provide an NTSC output signal. See the documentation that comes with your computer and your video board for information on their capabilities.

NTSC-compatible scan rates

Before your computer can output a movie to videotape, the scan rate of the video board must be set to NTSC-compatible rates. NTSC video is scanned at 29.97 Hz. Computer video boards scan at many different rates, including NTSC rates, depending on which monitors they are driving. If your board is not capable of NTSC-scan rates, you will need a scan converter to output your movie to tape.

Encoders

NTSC television signals and computer signals differ in how they are sent to the screen. If your video board is capable of outputting NTSC-composite signals (or if you already have a scan converter), you can output a movie directly to tape; if your video board is capable of outputting only NTSC-RGB signals, you will need an encoder. Many encoders that plug directly into the video board of your computer are available from third-party dealers, who also provide cabling for the monitor and jacks for connecting the computer to a VCR or TV.

PLAYING ADOBE PREMIERE MOVIES IN OTHER APPLICATIONS

In Adobe Premiere for the Macintosh, you can open a QuickTime movie that was created in the Windows version of the program and use it just like any other imported clip. You can also play Adobe Premiere movies in any Windows application that supports the Object Linking and Embedding (OLE) standard.

Using movies in Adobe Premiere for the Macintosh

You can import movies that were created in Adobe Premiere for Windows into the Macintosh version of the program, and you can import Macintosh versions of Adobe Premiere movies (from version 3.0 or higher) into the Windows version. A movie imported from a different platform is treated as a single clip. You can't edit the movie's individual parts unless you use the razor tool to split the movie into separate clips.

To use a Windows movie in the Macintosh version of Adobe Premiere:

1 In Adobe Premiere for Windows, compile the movie in the QuickTime format.

2 Open the file in Adobe Premiere for the Macintosh and answer Yes when the program asks whether you want to reformat the file in the QuickTime format.

3 Import the movie in the Project window just as you would any other clip.

To use a Macintosh movie in the Windows version of Adobe Premiere:

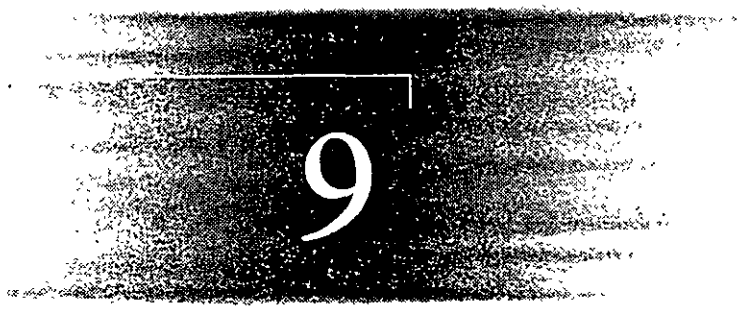
1 In Adobe Premiere for the Macintosh, use Export > Flattened Movie to create a flattened QuickTime movie. Don't use any compression unless you have the same compression codecs on both systems. Be sure to use the Windows file-naming convention (8-character prefix, 3-character extension), and use the *.mov* file extension.

2 In Adobe Premiere for Windows, import the movie in the Project window just as you would any other clip.

Transferring Adobe Premiere movies to OLE applications

You can use Adobe Premiere Video for Windows movies in applications that support the OLE standard by using the Video for Windows Media Player to copy and paste the movie.

Chapter



CHAPTER 9: CAPTURING VIDEO

This chapter describes how to record video images and sound directly to your computer by digitizing, or *capturing*, the analog video and audio signals. The chapter begins with a discussion of hardware requirements and considerations for producing the highest quality video and audio possible. The remainder of the chapter explains how to capture video and audio using Adobe Premiere's Movie Capture, Audio Capture, and Batch Capture commands.

DIGITIZING HARDWARE REQUIREMENTS

To record video, you need a video source (such as a VCR, camcorder, or laserdisc) and a video digitizing board (also called a video capture board or digitizer card). For recording sound, you need an audio capture board and the appropriate device drivers. Some video capture boards offer audio digitizing capabilities as well.

Video digitizing boards differ widely in their functions and capabilities. Many function as graphics display boards and video output boards. To digitize video using Adobe Premie the board must be compatible with Video for Windows. Your system must have the appr priate Video for Windows drivers installed on it.

If you have a controllable video playback device, you can capture video clips automatically by making reference to their timecode. To do this, you need a device controller such as the ARTI or the Videomedia V-LAN to control the source remotely using Adobe Premiere. Adobe Premiere also supports the control of any device with an MCI (Media Control Interface) device driver. With a controllable device, clips can also be viewed and logged with reference to their timecode and then batch digitized.

The connections between hardware components vary according to the equipment you use. You need to connect the video out ports of your video source to your video capture board, usually through a port in the back of your computer. If your digitizing board also supports audio, your audio source (normally the audio out port of your video source) must also be connected to the digitizing board. Refer to the documentation for your computer and your digitizing boards for the proper hardware setup and configuration.

GUIDELINES FOR CAPTURING VIDEO

Digital recording of full-frame, full-motion video requires a fast computer and lots of disk storage space. The size of the image frame, the number of colors, and the frame rate all affect how much data must be captured, and thus how quickly and how well video can be recorded. (For more information on memory requirements for capturing video, see "Digitizing Video" on page 285.)

As quality increases, so does the amount of data required to represent the video. Recent advances in processing power and memory have enabled desktop computer systems to process data effectively enough to capture, store, and play back digital video. But limitations remain. This section discusses how to maximize computer resources to decrease the amount of data needed while capturing video at the highest quality possible.

Strategies for reducing the amount of data needed to capture video

You must make some tradeoffs when trying to reduce the amount of data needed when capturing video. There are three main strategies for reducing the data, each of which compromises the quality of the captured video:

- Compressing the video data
- Reducing the image dimensions of the captured video
- Reducing the frame rate of the captured video

You can compress video data using both hardware compression and software compression. Several software compressors are available in Adobe Premiere. For more information, see "Digital Video Compression" on page 210.

If you can compromise the quality or the image dimensions, you'll be able to do a lot more with less. For example, you can capture at less than full frame and 30 fps when digitizing video for use on CD-ROMs because CD-ROM players have limited playback capabilities. For more information, see "Selecting Recording Options" on page 235.

If you need to capture full-frame video at 30 fps, you'll need specialty hardware and a lot of data storage capacity. Capturing full-frame video at 30 fps requires some type of hardware compression through the digitizing board.

Capturing the highest quality video

Capturing the highest quality video depends on the quality of the source video and on hardware factors.

Because the quality of the captured video will never exceed the quality of your source video, you should use the highest quality source possible. Currently, the highest quality video formats are the D1, D2, and D3 formats, followed by the Beta and 3/4-inch formats (used in the broadcast industry). Other more widely available formats are, in order of quality, laserdisc, Hi 8, Super VHS, 8mm, and VHS. If your video capture board supports both Composite and S-Video input, you should use S-Video if possible because S-Video is a higher-quality signal.

The following hardware factors affect the maximum frame rate and image size that can be achieved during capture and playback:

- Speed and compression capabilities of the video capture board
- Speed of the computer's hard drive
- Speed of the computer's *central processing unit* (CPU)
- Data processing load on the CPU
- Speed of the computer's *data bus* (the interface between the digitizing board and the CPU and hard drive)
- Available RAM, if you are capturing to memory

Video capture board speed and compression

The faster your video board, the faster the video frames can be drawn on-screen. To capture full-frame video at 30 fps, most boards capture only one of two fields (half the screen lines) in each frame and replicate the data to complete the frame. This compromises image quality. For capturing quarter-screen or smaller images, this compromise is not usually necessary.

In general, hardware compression on the capture board greatly increases movie capture performance. Video boards that have Motion JPEG compression can usually capture full-motion video very effectively. You will need to experiment with your computer and video digitizing board to determine what settings in Adobe Premiere produce the best results.

Hard drive speed

The faster your hard drive, the faster the computer can read and write data to and from the hard disk. For 30 fps capture, it is recommended that your hard disk have an average access time of 10 milliseconds (ms) or less, and a data transfer rate of 3 megabytes (MB)

per second or more. (This data transfer rate is currently available with 5400 rpm drives. As a general rule of thumb, the video data transfer rate will be about half the data transfer rate of the drive. You may achieve higher transfer rates with special SCSI connections, such as disk arrays, SCSI II or fast SCSI.)

CPU speed

The faster your CPU, the faster your computer will be able to process the data necessary to capture and play back digital video. Currently, the fastest processors are the Intel Pentium and the Intel 486 DX2 66 and 486 DX4 100.

CPU data processing load

During capture, make sure that you have as much of the CPU dedicated to the process as possible. This means turning off all unnecessary applications and minimizing all open windows except the Movie Capture window. You should also limit the size of the disk cache and make sure that the virtual memory allocation is no larger than twice the amount of installed RAM.

Data bus speed

The computer's data bus controls the rate of data transfer from the capture device to the CPU. Currently, the fastest bus standards are the VESA Local Bus (VL-Bus), and the emerging PCI standard, which is available on many Pentium computers with an Intel motherboard. The VL-Bus is a 32-bit bus. The newer VL-Bus 2.0 and the PCI bus are 32- to 64-bit buses.

Capturing directly to memory

On many computers, the best video capture method is directly to memory, or RAM. Capturing to RAM is faster than capturing to a hard drive, and is recommended when you have enough free memory to store the movie being captured. However, the movie's size is limited to the amount of free memory. The amount of memory you need depends on the image size, frame rate, compression method, and length of the captured video. Experiment with a clip to determine whether you have enough memory.

Use these guidelines when capturing video to memory:

- Free up as much memory as possible by closing other applications and turning off unnecessary utilities. The more memory you have available, the longer the movie you can capture.
- If you have a fast video board with hardware compression, you can perform compression as the movie is being captured. This allows you to record longer clips to memory.

If you do not have enough free memory to capture to memory, you must capture video to a hard disk. Use these guidelines when capturing to a hard disk:

- Use a high-speed hard disk and drive controller; the disk's speed is measured by the disk's sustained data transfer rate. If you have several hard disks, capture to your fastest hard disk.
- Use a dedicated hard disk or create a separate partition on your hard disk for capturing video.
- Create a preallocated capture file so that video data can be recorded in contiguous clusters on the hard disk. This reduces disk drive activity during capture and reduces the chances of dropped frames. After capturing video data to a capture file, you must move the file to a new location. The next time you capture data, it will be written to the same capture file on the hard disk. For more information, see "Setting Up the Capture File" on page 233.
- Do not record to a fragmented hard disk, because it can reduce the frame rate at which movies are captured. Use a defragmenting utility, such as Norton Utilities, to optimize and defragment the hard disk as often as necessary to keep it efficient.
- If you have more than one hard disk, use the Scratch Disks Preferences to select the disk to which you want to record. To do this, choose Preferences > Scratch Disks from the File menu; then select the disk name from the list of available names in the dialog box.

Capturing without software compression

The compression process itself requires time. Thus, with smaller movies (160-by-120 pixels), you can achieve higher frame rates by capturing the movie with no compression. As you increase the size of the movie, however, capturing without compression decreases the frame rate because the capturing is limited by the data transfer rate of the bus. In general, you should use the compression method that is automatically chosen by your video capture driver.

Capturing full-screen images

You can capture full-screen video (640-by-480 pixels) two ways: in real time using hardware compression, or in nonreal time using a frame-accurate tape deck or a laser disk that is controllable by the computer. In general, capturing in real time with hardware compression provides the fastest and easiest method for capturing full-screen video.

Nonreal-time capture methods, or *step capture* methods, grab a single frame of the mo at a time, or make multiple passes until they have captured all the needed frames. These methods require that you have a frame-accurate tape deck, timecode on your source tape,

and a third-party device controller that can perform nonreal-time capturing of video data. Video captured in nonreal-time is generally not of very high quality unless you use a high-end deck or a laserdisc.

You can produce results that are similar to video captured at full-frame by capturing video at quarter-screen (320-by-240 pixels) and then using the zoom capability of the Print to Video command during playback or recording to videotape. Capturing at quarter-screen and then zooming requires substantially less disk space for data storage, improves editing performance in Adobe Premiere, and generally produces the same results as if you had captured the video at full-frame. The latter is because most video capture boards can capture all of the video data at quarter-screen, but only half of the video data at full screen. For information on hardware zooming with Print to Video, see "Using Print to Video" on page 219.

You can also improve performance when working with full-screen video in several ways. You can improve editing performance by creating a set of miniatures from the original clips, and then replacing the miniatures with the original files when you are ready to output the final movie. (For more information on creating a set of miniatures, see "Making Miniatures to Improve Performance" on page 41.) If you have a controllable tape deck, another effective strategy is to digitize clips at low resolution for editing, and then redigitize all the clips in the Project window using Batch Capture. (For more information on batch capturing, see "Batch Capturing with Device Control" on page 241.)

GUIDELINES FOR CAPTURING AUDIO

With Adobe Premiere, you can capture audio in the sound channel of a Video for Windows file or as a Windows waveform (*.wav*) file. For both types of capture, you can select options that affect the quality of the audio files.

The quality of digitized audio and the size of the audio file depend on the sampling rate and bit depth of the sample. These parameters determine how well the analog audio signal is represented when it is digitized. Audio sampled at 22 kHz and 16-bit resolution is far superior in quality to audio sampled at 11 kHz and 8-bit resolution. CD audio is normally digitized at 44 kHz and 16-bit resolution. As with video, however, as quality increases, so does the amount of data required to represent the sample. CD-quality audio may not be practical for your video because of the memory requirements.

SETTING UP THE CAPTURE FILE

When Adobe Premiere captures video, it temporarily stores the video data in a capture file on your hard disk until you save the video as an *.avi* file. If your hard disk is fragmented, Adobe Premiere may need to seek additional disk space during the capture, which may result in dropped frames.

You can preallocate space on your hard disk for the capture file so that Adobe Premiere does not need to look for additional space as it is capturing data. A preallocated capture file is created in contiguous blocks on your hard disk. Adobe Premiere simply reuses the same space for each capture session, so you do not need to rebuild the capture file. You must, however, save the captured data to an *.avi* file when you finish capturing video; otherwise, your data will be overwritten during the next capture session.

To use a preallocated capture file:

1 Choose Capture File from the Movie Capture menu. The Capture File Options dialog appears.

2 Select the Use Preallocated File option. The Create Capture File dialog appears.

3 Enter the size of the capture file in megabytes. The dialog box shows the currently available amount of space on the scratch disk. The capture file size can be up to 2 MB less than the available disk space. The capture file is called *capfile.avi* and is created in the root directory of the hard disk selected in the Scratch Disks Preferences.

4 Click OK.

SELECTING PREVIEW OPTIONS

Preview options let you specify how you preview movies before you capture them. If your video capture board supports overlay previewing, you can preview a live video signal on your computer monitor. In overlay mode, the source video passes directly to the Capture window rather than being processed by the board. Overlay previewing requires much less processing than does standard previewing.

You can specify the frame rate for previews that you play either before or during capture. Decreasing the frame rate reduces the processing time; increasing the frame rate gives a more accurate preview.

To use overlay previewing:

Choose Overlay from the Movie Capture menu. The checkmark next to Overlay indicates that this feature is turned on.

To set the preview rate:

1 Choose Preview Rate from the Movie Capture menu.

2 Select the frame rate when previewing and the frame rate when capturing from the drop-down lists.

3 Click OK.

CAPTURING WITHOUT A CONTROLLABLE DEVICE

You can capture video to your hard disk in real time by monitoring the signal in the Movie Capture window and recording the frames that you want. The effectiveness of this method depends on the speed of your CPU, the capabilities of your video digitizing board, and the size of the video frames you are capturing. You should close all other applications before capturing. For more information on capturing video, see "Guidelines for Capturing Video" on page 228.

Note: *If you are using a controllable device to capture a movie, see "Capturing with Device Control" on page 238.*

To capture without a controllable device:

1 Choose Capture > Movie Capture from the File menu. The Movie Capture window appears, and the Movie Capture menu appears in the menu bar.

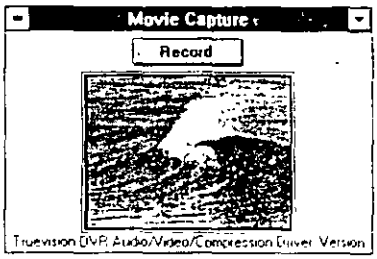
2 Select recording options using the Recording Options command in the Movie Capture menu. For more information on recording options, see "Selecting Recording Options" on page 235.

3 Use the Video Source command in the Movie Capture menu to select a video source and set video source options specific to your system configuration. The dialog box that appears depends on the video driver you have installed; it usually allows you to choose the type of video signal, such as NTSC or PAL. See your capture board documentation for more information.

4 Use the Audio Recording Options command in the Movie Capture menu to select audio options specific to your system configuration. For more information on audio options, see "Capturing Audio" on page 237.

5 Press the Play button on the tape deck to start the tape. If you are recording images, the tape begins to preview in the sample area of the Movie Capture window.

6 Click the Record button to start the recording. You should start the recording 1/2 second to 1 second before the first frame you want in your clip, to ensure that the video capture board is digitizing at full speed.



The pointer disappears during recording. To stop recording, click the mouse button or press the Esc key. When the recording has finished, the clip appears in an untitled Clip window.

7 Use the Save command to save the clip.

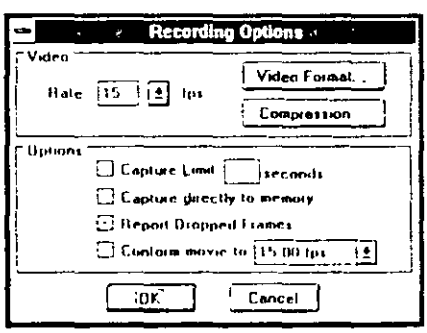
SELECTING RECORDING OPTIONS

The Recording Options dialog box lets you determine how Adobe Premiere captures video. The video options that are available depend on the video capture driver that is installed on your system.

To set recording options:

1 Choose Capture > Movie Capture or Capture > Batch Capture from the File menu. The Movie Capture or Batch Capture menu appears in the menu bar.

2 Choose Recording Options from the Movie Capture menu. The Recording Options dialog box appears.



3 Select the frame rate for the captured movie from the Rate drop-down list.

4 Click Video Format and set the video format options. The dialog box that appears depends on your installed video capture driver. Generally, the dialog box includes options to set the image size in pixels and the image format. Standard image formats include 8-bit color, 16-bit color, or 24-bit color and RGB, MPEG, or JPEG format. Keep in mind that larger image sizes and a higher number of colors increases the size of data for each frame. In general, the default compression options for a particular video capture board are the most efficient capture settings. For more information about the options in this dialog box, see your video capture board documentation.

5 Click Compression to set compression options for your video board. The dialog box that appears depends on your installed video capture driver. It generally provides controls to set the compression type and quality for compressing video data *after* it has been captured, which you would use if you were capturing without hardware compression. Because many boards use hardware compression, these options are usually not available.

6 To set the maximum number of seconds to capture, select Capture Limit.

7 To capture to memory rather than to disk, select Capture Directly to Memory. Capturing to memory is faster, but it requires a great deal of memory.

8 To have Adobe Premiere analyze the movie for dropped frames after video capture, select the Report Dropped Frames option. A warning appears after capturing if any frames have been dropped.

9 To ensure that all captured frames have exactly the same duration, select the Conform Movie To option and select a frame rate from the drop-down list. This is a built-in time base corrector. All video tape decks have a potential for frame rate errors. For precise editing, it is important that all frames have the correct duration. If you are capturing at full speed (30 fps) and you will be outputting your movie to videotape, set the conform frame rate to 29.97. Otherwise, set the conform frame rate to the rate at which you are capturing video. Adobe Premiere adjusts each captured frame to match exactly the frame rate that you select.

10 If you are using device control, set the following three options if they appear in the Recording Settings dialog box:

- Pre-Roll Time. Use this option to adjust the pre-roll time that allows the tape deck to get up to speed before digitizing occurs. The default setting (3 seconds) is usually adequate.
- Timecode Offset. Use this option to enter an adjustment setting to calibrate the captured frame rate. For more information, see "Calibrating Timecode" on page 245.

• Use Reel Name as File Name in Logging Window. Use this option if you want Adobe Premiere to use the reel name as the filename in the batch capture log. For information on batch capturing, see "Batch Capturing with Device Control" on page 241.

11 If you are using a device control driver that supports step capture, set the following options if they appear in the Recording Settings dialog box:

• Average Frames. Use this option to capture the same frame more than once and then average the frames to get the final captured frame. Using this option helps correct for the jittering caused by freezing on a video frame.

• 2x Oversample. Use this option to capture video at twice the desired image size. Adobe Premiere then scales the image to the movie's specified image size.

CAPTURING AUDIO

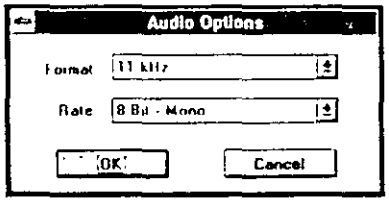
You can use Adobe Premiere to capture audio as part of a Video for Windows movie or you can use a third-party audio capture program such as the Microsoft Windows Sound Recorder to capture audio as a waveform (*.wav*) file. You can also capture only the audio portion of a Video for Windows movie to create a waveform file, as described in the following section.

To capture audio as part of a Video for Windows file:

1 Choose Capture > Movie Capture from the File menu.

2 Choose Record Audio from the Movie Capture menu. The checkmark indicates that audio capture is turned on.

3 Choose Audio Recording Options from the Movie Capture menu. The Audio Options dialog appears.



4 Select a format from the Format drop-down list. You can select either 11 kHz, 22 kHz, or 44 kHz.

5 Select a rate from the Rate drop-down list. You can select 8-bit or 16-bit resolution in either mono or stereo.

6 Click OK.

7 Use the Movie Capture window to begin recording.

To capture audio using a third-party program:

1 Choose Capture > Audio Capture from the File menu.

2 In the standard Open dialog, locate the capture program you want to use. For example, to use the Microsoft Sound Recorder, locate the file *soundrec.exe* in the Windows directory.

3 Click OK.

4 Use the audio capture program to record an audio file.

Adobe Premiere remembers the program you use to record audio. The next time you choose Capture > Audio Capture, the program is automatically started.

CAPTURING VIDEO OR AUDIO ONLY

You can capture Video for Windows movies without the video or audio portion. To record the video portion of a movie, choose Record Video from the Movie Capture menu. To record the audio portion of a movie, choose Record Audio from the Movie Capture menu. If an option is not selected, the corresponding portion of a movie will not be captured. If you capture only the audio portion of a movie, it is saved as a waveform file.

CAPTURING WITH DEVICE CONTROL

If you have a controllable tape deck that supports timecode, a device controller, and a plug-in module that allows you to control the tape deck through Adobe Premiere, you can control the capture of video clips by identifying the timecode address for the starting and ending frames (called *capturing with device control*). You can capture with device control only if the source videotape was recorded with timecode.

Be sure to calibrate your system if you plan to capture timecode with your clips, especially if you will redigitize your clips or if you plan to create an Edit Decision List (EDL) from your project. For more information on calibration, see "Calibrating Timecode" on page 245.

Using device control has the following advantages:

- You can control the tape deck from the computer screen instead of switching between the computer and the tape deck.
- You can set in points and out points for clips using the Movie Capture or Batch Capture windows and then record between those points automatically.
- You can automatically advance your tape deck to the frame displayed in the In or Out field of the Movie Capture window by Alt+clicking the In or Out button in the Movie Capture window, or by pressing I or O on the keyboard.

- You can stamp timecode onto the digitized movie if your deck has the capability of reading timecode. You can also calibrate this timecode if the source video has burned-in timecode (also called visual timecode, or window dubs).
- You can capture movies in slow motion if your deck is capable of variable playing speeds, and then increase the frame rate after the movie has been captured. This lets you capture movies at higher frame rates.
- You can create EDLs for online editing in a post-production studio.

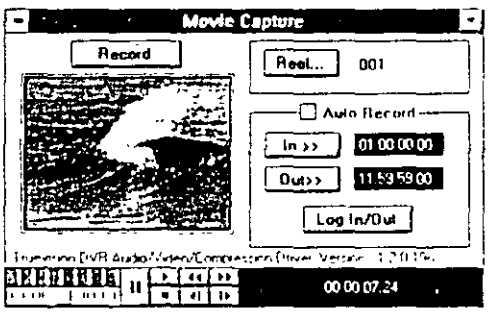
To record using device control:

1 Choose Preferences > Device Control from the File menu. The Device Control dialog box appears.

2 Select the device controller you are using from the drop-down list.

Note: If you are using a VISCA tape deck, you must have a VISCA driver installed on your system. The VISCA driver is included with Adobe Premiere in the drivers *directory. You can select a VISCA device by choosing MCI VCR in the Device Control dialog box.*

3 Choose Capture > Movie Capture (or Audio Capture) from the File menu. The Movie Capture window appears.



Note that the controls that appear in the dialog box vary slightly according to the capabilities of the recording device.

4 Select recording options using the Recording Options command in the Movie Capture menu. For more information on recording options, see "Selecting Recording Options" on page 235.

5 Use the Video Source command in the Movie Capture menu to select a video source, and set video source options specific to your system configuration. The dialog box that appears depends on your installed video capture driver; the dialog box usually lets you choose the type of video source, such as NTSC or PAL. See your capture board documentation for more information.

6 Use the Audio Recording Options command in the Movie Capture menu to select audio options specific to your system configuration. For more information on audio options, see "Capturing Audio" on page 237.

7 To identify the reel you are using, click the Reel button in the Movie Capture window and type a name in the Reel Name text box.

8 Use the Jog control, Shuttle control, or control buttons at the bottom of the Movie Capture window to control the tape deck and locate the frames that you want to digitize. You can also use these keyboard shortcuts:

- Press P or the spacebar to play or pause the videotape.
- Press S to stop the videotape.
- Press the right arrow key to advance one frame.
- Press the left arrow key to back up one frame.
- Press F to fast-forward the videotape.
- Press R to rewind the videotape.

The timecode display at the bottom of the window shows the current frame. You can cue the tape deck to a specific location by clicking the display, typing in the timecode address, and pressing Return. If you type a plus (+) or minus (–) sign before the timecode, the deck will advance or rewind by the specified amount of time.

9 Identify the frames you want captured in one of the following ways:

- As the tape plays, click the In and Out buttons to indicate the starting and ending frames. The timecode addresses for these frames will be entered automatically into the In and Out fields.
- As the tape plays, press Shift+I to set the in point frame or Shift+O to set the out point frame.
- As the tape plays, press the 1, 4, or 7 key in the numeric keypad to set the in point frame. Press the 3, 6, or 9 key to identify the out point frame. The timecode addresses for these frames will be entered automatically into the In and Out fields.
- Click the In or Out timecode displays (or press I or O) and type in the timecode address for the starting and ending frames. You can cue the tape deck to the frame displayed in the In or Out fields by holding down the Option key and clicking the In or Out button, or by holding down the Option key and pressing I or O on the keyboard.

10 Turn the Auto Record option on.

11 Click the Record button at the top of the Movie Capture window, or press G on the keyboard. The tape deck searches for the displayed timecode and records the selected images. When the recording has finished, the tape deck pauses automatically and the clip appears in an untitled Clip window.

12 Use the Save command in the File menu to save the clip.

BATCH CAPTURING WITH DEVICE CONTROL

This section describes how you can log the timecode information for the in and out points of several clips you want digitized, and then have the program capture the clips automatically. This process is called *batch capturing.*

Batch capturing is especially useful if you want to edit a movie using low-resolution clips and to redigitize the clips later at higher resolution for outputting your movie. This approach improves editing performance in Adobe Premiere and uses less space on your hard disk. For more information on using low-resolution clips, see "Using Low-Resolution Clips to Improve Performance" on page 42.

Generating a list for batch capturing

Clips are logged into a batch list using the Log In/Out feature of the Movie Capture window.

The Batch Capture window stores a *timecode log*—a list of clips with their associated capture parameters. When digitizing a batch list, Adobe Premiere uses the current settings for recording, compression, video input, and audio input unless you have assigned Settings files (saved using the Save Settings command) to individual clips in the list. Assigned settings are loaded automatically when Adobe Premiere digitizes a clip in the batch list.

You can create or open multiple Batch Capture windows. Create a new Batch Capture window by choosing Capture > Batch Capture from the File menu. Save an active Batch Capture window by using the Save command in the File menu. Open an existing Batch Capture window by using the Open command in the File menu.

Note: *Timecode logs in the Batch Capture window can be exported and imported as text files. Use the Export to Text File command in the Batch Capture menu to save a timecode log. Use the Import from Text File command to import a timecode log into an active Batch Capture window. Use the Import/Export Settings command to rearrange the order of the columns in the imported or exported timecode log.*

To generate a timecode log for batch capturing:

1 Choose Capture > Movie Capture from the File menu. The Movie Capture window appears, and the Movie Capture menu appears in the menu bar.

2 Select recording, compression, video input, and audio input options (for more information, see "Selecting Recording Options" on page 235).

3 To identify the reel you are using, click the Reel button and type a name in the Reel Name text box.

If you want Adobe Premiere to automatically name the files in the batch list, click the Use Reel Name as Filename in Logging Window option in the Recording Settings dialog box.

4 For each clip that you want logged, identify the frames that you want to capture by clicking the In and Out buttons as the tape plays, or by typing the timecode into the In and Out fields.

You can use the control buttons at the bottom of the Movie Capture window to control the tape deck and locate the frames you want to digitize. The timecode display at the bottom of the window shows the current frame. Click the display to enter the timecode, and press Enter to cue the tape deck to that location.

5 Click the Log In/Out button or press Return to enter the clip in the timecode log.

If you do not have a batch list open, Adobe Premiere will create an untitled Batch Capture window. The timecode log is updated in the Batch Capture window each time you click the Log In/Out button. For each clip in the list, a set of capture parameters is displayed: reel name, in point, out point, filename, and settings.

6 Use the Sort button in the Batch Capture window to sort the list alphabetically and numerically by the reel name and the timecode start times.

To add comments or change batch capture parameters:

1 Double-click a clip in the Batch Capture window. The Clip Capture Parameters dialog box appears with the current settings for the clip. This dialog box also appears when you click Add in the Batch Capture window, allowing you to add a new clip to the list by typing in the parameters.

2 Enter updated values for the reel name, filename, in and out points, frame rate, and timecode format.

3 Add a comment to a clip by entering text in the Comment field.

4 Click OK to enter the updated values in the Batch Capture window.

To assign settings to a clip in the batch list:

1 Select the clip in the Batch Capture window. Shift+click additional clips to apply the same setting to multiple clips.

2 Choose Attach Settings from the Batch Capture menu. The Attach Settings dialog box appears.

3 Locate the file that contains the settings, and click OK. The name of the attached settings file appears in the batch list. For more information on saving settings, see "Loading and Saving Recording Settings" on page 244.

To remove the settings, select the clip and choose Remove Settings from the Batch Capture menu.

Note: When Adobe Premiere digitizes a clip with attached settings, those settings become the current Movie Capture settings and will be applied to subsequent clips in the list that do not have attached settings.

Capturing clips using a batch list

A small black diamond next to a clip's reel name indicates that the clip will be captured when you click the Capture button in the Batch Capture window. You can toggle the diamond on and off by clicking to the left of the reel name. After a clip has been captured, a check mark appears in place of the diamond. A red *X* indicates that an error occurred when the clip was being digitized.

You can use the Handles command in the Batch Capture menu to digitize extra frames before the in point and after the out point of each clip. The in point and out point of each clip will not change, but the extra frames will enable you to extend the clip later, if desired.

Note: To open a previously saved Batch Capture window, use the Open command in the File menu. Batch capture lists are saved as text files with a .pbl *file extension.*

To capture clips in the batch list:

1 Make sure that the clips you want digitized appear with a small diamond next to the reel name. If no diamond appears, click to the left of the reel name.

2 Click Capture in the lower right corner of the Batch Capture window. The Select Library dialog box appears.

3 Locate the library file where the captured clips are to be placed, or click New to create a new library.

After you have located the library file, Adobe Premiere prompts you to insert the proper reel in the tape deck. When you have done so, the tape deck searches for the timecode addresses indicated and records the selected images. When all clips have been recorded, the tape deck stops automatically.

The digitized clips appear in the Library window. The clips are stored in the directory that contains the library. You can drag clips from the Library window to any Project or Construction window.

Creating a batch list from an existing project

Using batch capture, you can redigitize the clips in an existing project and log the clips according to their existing in points and out points to create a batch list.

A batch list lets you easily redigitize the clips when higher resolution files are needed for a project and minimize file sizes by recapturing only the needed segments from the original source reel. You can create a trimmed batch list or a manual batch list. For more information on using low-resolution clips and redigitizing, see "Using Low-Resolution Clips to Improve Performance" on page 42.

To generate a trimmed batch list, use the Project Trimmer. All clips are logged according to their in points and out points. This minimizes the disk space needed because Adobe Premiere will recapture only the trimmed portion of each clip in the project. For more information on using the Project Trimmer, see "Trimming Projects" on page 31.

To manually log project clips in a batch list, drag them from the Project window into a Batch Capture window. They are automatically logged according to their original duration. Any changes to the in and out points are discarded.

LOADING AND SAVING RECORDING SETTINGS

The recording, compression, video input, and sound input settings for any video or audio digitizing session can be saved as a *.pcs* file by choosing the Save Settings command from the Movie Capture menu. You can load settings for digitizing at a later time using the Load Settings command in the Movie Capture menu.

Note: *Settings for Record Video or Record Audio will not be saved in the settings file if they have been turned off in the Movie Capture menu.*

CAPTURING TIMECODE

Timecode provides a means of accurately locating frames and synchronizing picture and audio elements in video. SMPTE (Society of Motion Picture and Television Engineers) timecode identifies each video frame with a unique address, in the form Hours: Minutes: Seconds: Frames. For more information, see "SMPTE Timecode" on page 284.

Capturing timecode with device control

To ensure that the timecode is accurately recorded when you use controlled movie capture, calibrate your device controller (see "Calibrating Timecode" on page 245), and turn off other applications that may interrupt your system (such as e-mail, file sharing, and special clocks).

During capture, only the in point of the movie needs to be autorecorded, because the pre-roll of the deck guarantees the frame accuracy. By default, the out point timecode is greater than the length of your tape; thus, the entire tape can be captured without setting an out point at the end of the tape. You can stop autorecording at any point during capture by clicking the mouse button.

Note: *Timecode capture with controllable devices depends on the capability of your tape de If your tape deck cannot read the timecode accurately, you may have to calibrate your system or manually assign the timecode to your movie by matching frames, as described in the following section..*

Calibrating timecode

When capturing SMPTE timecode with a controllable device, you should make sure that your system is calibrated. With some device controllers, changes to video and audio input options can affect the timecode stamping of Video for Windows movies. As a result, the timecode reading of the first frame that appears in the Clip window may not correspond to the timecode on your videotape. To compensate for these errors, Adobe Premiere provides a manual calibration feature.

The manual calibration feature, called Timecode Offset, appears in the Recording Options dialog box when you have a device controller selected. Timecode Offset lets you adjust the capture rate in quarter-frame increments. In most cases, however, errors appear in whole frame increments. To calibrate by whole frames, enter the numbers in multiples of four. If the timecode displayed in the Clip window is greater than the actual timecode, enter a positive number in the calibration setting. Otherwise, enter a negative value by typing a minus sign (–) before the numeric value.

Even when calibrating timecode manually, it is best to use a video source that has burned-in timecode. If you do not have a video source with burned-in timecode, you must compare frames in the Clip window with frames from the video tape. If the frames and the timecode addresses do not match, change the Timecode Offset value.

STOP-MOTION CAPTURING

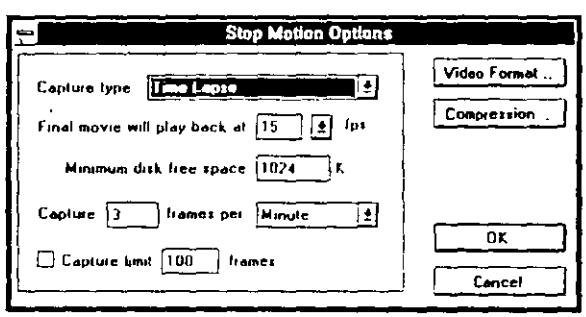
Adobe Premiere's Stop-Motion feature allows you to perform single-frame manual and time-lapse video captures. This is especially useful for building stop-frame animations, where you point a camera at a scene and record frames as the scene changes. You can also use the Stop-Motion feature to capture a frame and save it as a still image.

Note: *Any movie frame can be used as a visual guide for positioning during stop-motion capturing. The procedure for setting up a background image works the same way for the Stop Motion window as it does with the Title window. For more information, see "Setting Up the Title Area" on page 193.*

To perform stop-motion capturing:

1 Choose Capture > Stop Motion from the File menu. The Stop Motion window appears, and the Stop Motion menu appears in the menu bar.

2 Choose Capture Options from the Stop Motion menu. The Stop Motion dialog box appears.



3 Set the following recording options:

• Capture Type. Select Time Lapse for automatic, timed recording of single frames. Select Manual Capture to manually capture single frames.

• Minimum Disk Free Space. Set the minimum free space on your disk to be maintained during capture. You will be alerted if the free space falls below this value, thus stopping the capture before you run out of disk space.

• Capture Frames. If you are capturing in time lapse mode, enter the number of frames you want captured per unit of time.

• Capture Limit. If you want to limit the number of captured frames, select this option and enter a limit.

4 Start your video source (camera or tape deck).

5 Press the Start button in the Stop Motion window.

• If you have the Time Lapse option selected, Adobe Premiere will capture frames at the specified rate. Click the Stop button in the Stop Motion window to stop capturing frames.

• If you are capturing manually, press the Step button in the Stop Motion window to capture a frame. Press a number on the keypad to capture a specified number of continuous frames. Press Delete to remove the last frame captured.

6 Press the Done button in the Stop Motion window when you have finished capturing. The captured frames appear in an untitled Clip window.

7 Use the Save command to save the clip.

To capture still images:

1 In the Stop Motion dialog box, select Still Image in the Capture Type drop-down list.

2 Click Video Format and select an 8-bit or 24-bit image format. You must save still images in one of these two formats.

3 Start your video source (camera or tape deck).

4 When you've located the frame you want to capture, click Capture in the Stop Motion window. The image is captured as a bitmap (*.bmp*) file and appears in an untitled Clip window.

5 Use the Save command to save the image.

CAPTURING A PALETTE

If your movie will be played back on an 8-bit color computer, you can capture video using a color palette that limits the number of colors in the captured movie. Using the Capture Palette command, you can have Adobe Premiere create a new palette for each movie that you capture; or you can load a color palette file that you have edited.

To create a palette during movie capture:

1 Choose Capture > Movie Capture from the File menu.

2 Choose Capture Palette from the Movie Capture window. The Capture Palette dialog appears.

3 In the Colors text box, type the number of colors to create. Type a number between 2 and 236, or type 256. Although the total number of available colors in a color palette is 256, Windows reserves 20 colors for items on the Windows desktop. To avoid overwriting those color entries and disrupting the appearance of the Windows desktop when your movie is played back, you should capture no more than 236 colors.

4 Type the number of frames you want to use to create the palette in the Frames text box.

5 Click OK.

6 To save the palette, choose Save Palette from the Movie Capture menu.

To use an existing palette:

1 Choose Load Palette from the Movie Capture window.

2 In the standard Open dialog, locate the palette file (*.pal*) you want to use. Click OK.

Chapter

10

Chapter 10: Tips and Techniques

This chapter contains a collection of step-by-step procedures for achieving professional video-editing results using Adobe Premiere. The procedures describe traditional techniques, such as superimposing figures against a background, as well as less conventional techniques, such as rotoscoping filmstrips.

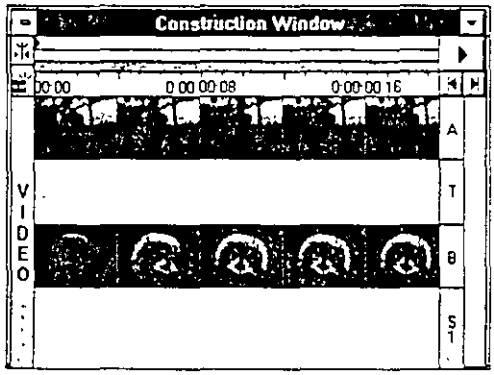
This chapter assumes that you are familiar with the basic features of Adobe Premiere and how to use them. For information on a specific feature, see the appropriate section of this user guide.

A clip of an owl plays in an inset while a field scene plays in the background.

Creating insets

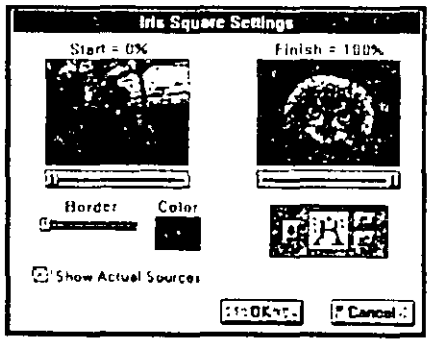
This procedure shows how to create an inset for simultaneously playing a separate clip in the movie frame.

1 Start by dragging the clip you want to play in the background onto track A and the clip you want to play in the inset onto track B.

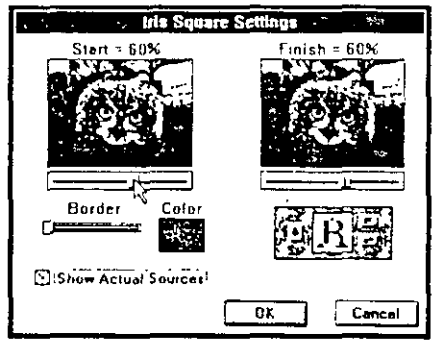


2 Drag a transition, such as the Iris Square (shown here), Iris Round, or Zoom transition, onto the T track. (For an example of a Zoom transition inset, see steps 22 and 23 of "Creating a 360-Degree Presentation" on page 271.)

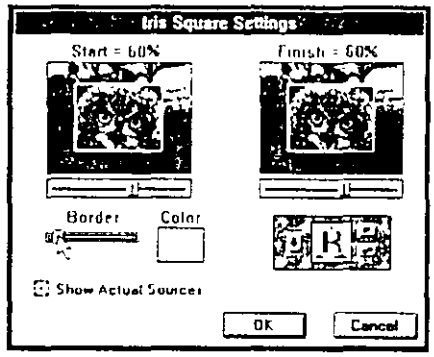
3 Align the left edge of the transition with the beginning of the clips and the right edge of the transition with the end of the clips. Double-click the transition to display the Transition Settings dialog box, and select Show Actual Sources.



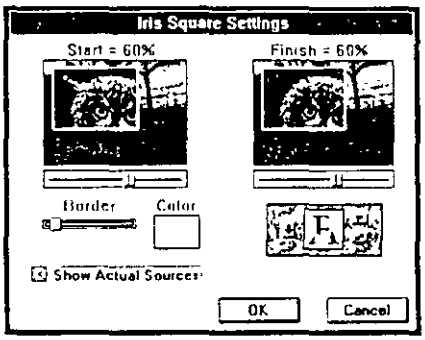
4 To create the inset rectangle, hc
the Shift key and drag the Start slic
right. Holding down the Shift key cau
the End slider to move with the Start sl
creating the same size inset rectangles
both the start and end points of the cli
that the size of the inset remains const
Drag to the right until the inset is the
desired size.



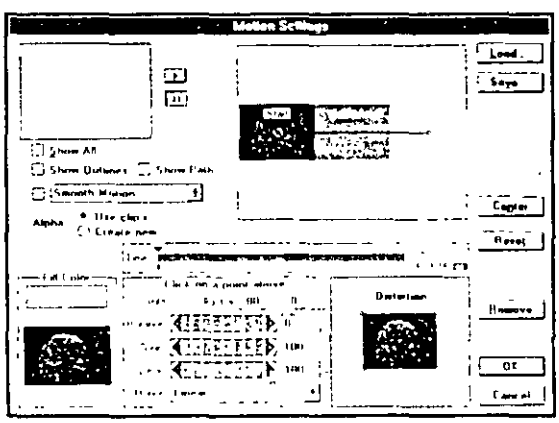
5 To apply a border to the inset, use th
Border slider to set the width; then
color swatch to display the color picke
and select a color for the border.



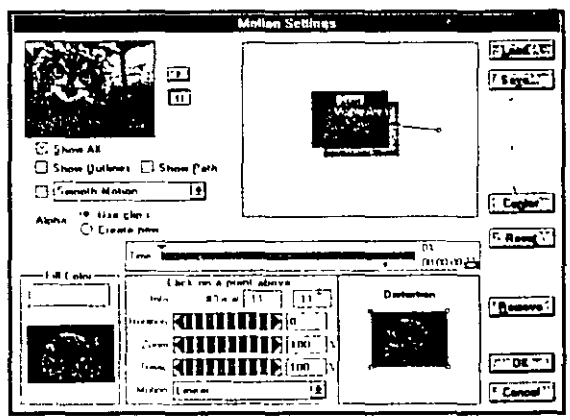
6 If you want the inset to play on a different part of the movie screen, drag the dot from the middle of the Start preview window to the desired position.



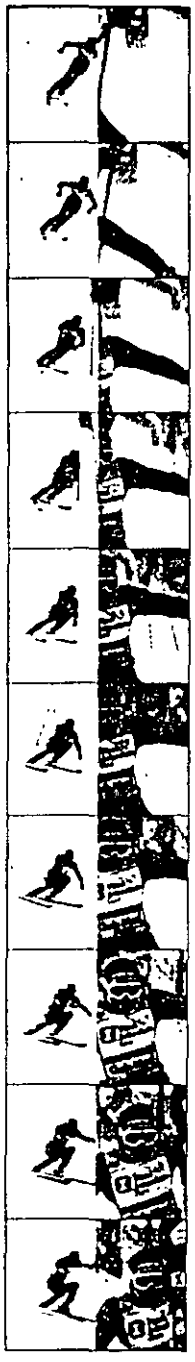
7 To reposition the clip within the inset, select the clip on track B, and choose Motion from the Clip window to display the Motion Settings dialog box. Click the Start (left) point on the motion path, and apply a delay of 100 percent. This keeps the clip stationary and lets you use the Motion Settings repositioning feature without actually applying motion to the clip.



8 To freeze the motion and preview the inset, select the Show All option, and click the Pause button to the right of the preview window. You'll see the background clip with a cut-out where the inset will play. Click the Start point of the motion path and drag the point into the Visible area; the preview window changes to reflect the repositioning of the clip. To move the Start point in 1-point increments, select the Start point and press the arrow keys. When the clip is centered within the inset window, click OK.



9 Preview the results.

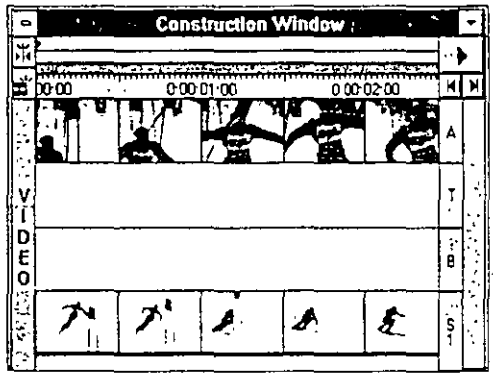


▶ Two skiing clips play on a split screen.

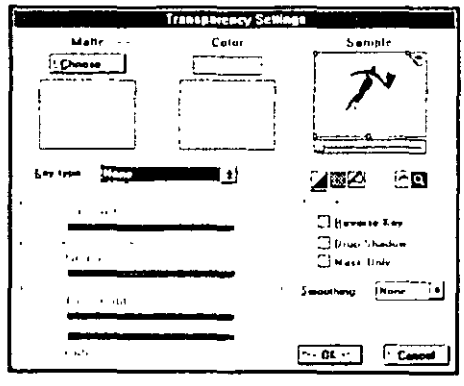
Creating a split screen

This procedure shows how to create a split screen for playing two clips simultaneously.

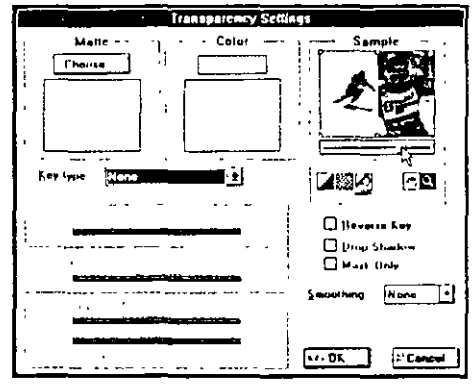
1 Start by dragging two clips into the Construction window: one to track A and one to the S1 track.



2 Select the clip on the S1 track, and choose Transparency from the Clip menu to display the Transparency Settings dialog box. Use the default key type of None—you'll use a garbage matte to create the split screen. In the Sample window, drag the handles of the garbage matte to crop half of the image.



3 Click the page peel icon to [illegible] garbage matte. Use the slider [illegible] garbage matte to preview the clip the matte.



4 Preview the results.

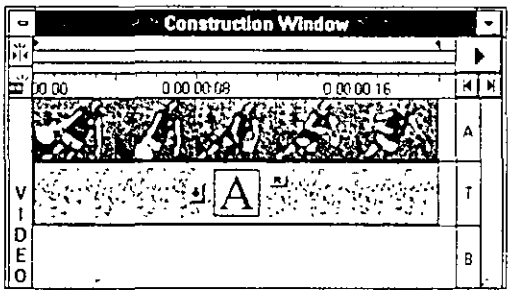
Experiment with different shapes garbage mattes.

A clip of one frisbee player spirals away from the screen; then a clip of another spirals in

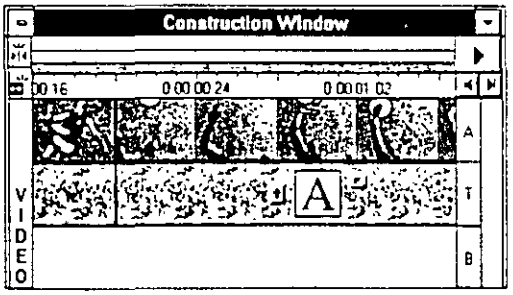
Customizing transitions

You can use a transition twice to give the appearance of a new transition.

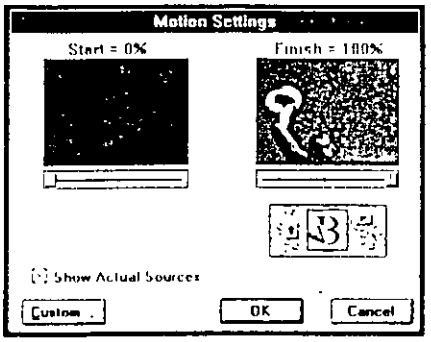
1 Start by dragging a clip onto track A and aligning it with the 0:00:00:00 mark on the time ruler. Drag the Motion transition onto the T track, aligning the end of the transition with the end of the clip. Double-click the transition to display its dialog box, and click the Forward/Reverse selector to select R (reverse). This causes clip A to play as it spirals away to a black background.



2 Copy the Motion transition; then click the section of the T track to the right of the original, and paste the copy. Drag a second clip onto track A, aligning it flush left with the first clip.



3 Preview the transition. Notice that the second clip opens at full-screen when the first clip ends. To make the second clip appear to spiral back in, double-click the second transition to display its dialog box, and click the track selector so that it points up. Select the right edge selector, and change the Forward/Reverse selector from R to F.



4 Preview the results.

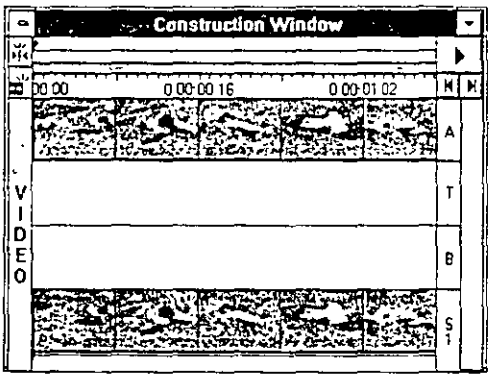
Try this technique with other transitions that swing in and out such as the Spin, Swing In, Swing Out, Split, and Wipe transitions.

▷ As a swimmer moves across the screen, the image outside the *S* is converted to grayscale.

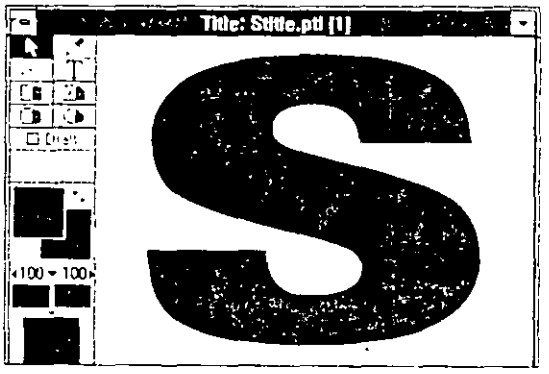
Applying filters to isolated areas of clips

You can apply a filter to an isolated area of a clip using the Image Matte key type.

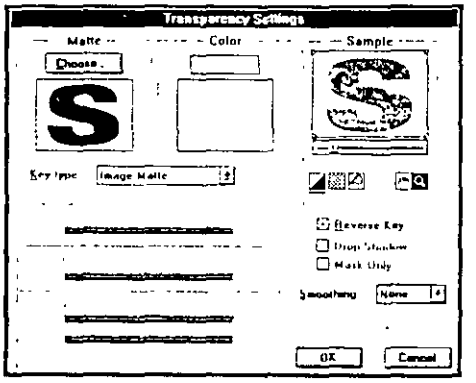
1 Start by dragging a clip onto the S1 track of the Construction window, and then copy and paste the same clip onto track A.



2 Create a still image to use as a key or "mask." You can use a letterform or object created in the Title window, as in this example; or you can use an image created in Adobe Photoshop.

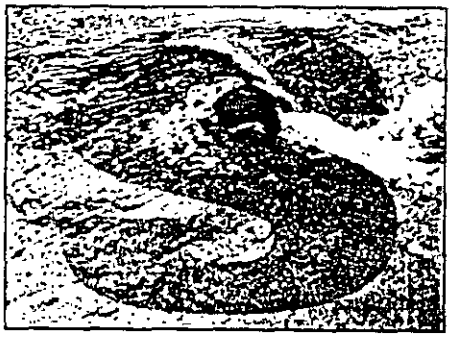


3 Select the clip on the S1 trac' n choose Transparency from the .p to display the Transparency Setting: box. Select the Image Matte key typ Choose, and select the still-image k just made. The Sample window pre the image matte. Select Reverse Ke invert the effect.



4 Select the clip on track A. Choose from the Clip menu to display t dialog box and select a filter to apply clip. This example used the Black & filter to convert the color image to g scale. Keep in mind that if you use a that doesn't alter the clip's color, the may be subtle.

5 Preview the results.

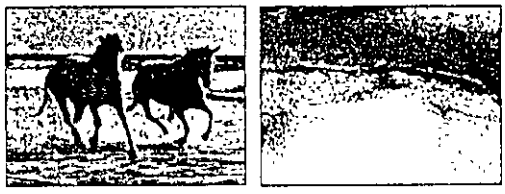


The gray values of a clip of running horses are superimposed over a still image of stone.

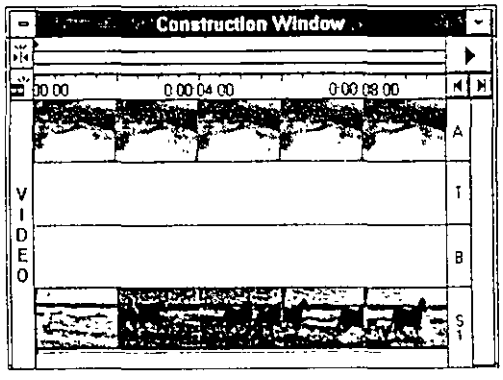
Adding texture to movies

The Luminance key type allows you to superimpose movies over textured backgrounds, so that the superimposed movie assumes the texture of the background. This procedure works best with images with a wide range of gray values because the Luminance key option keys just the gray values of an image without keying the color.

1 Choose a clip to play over the background; the clip should have a wide range of gray values. Next, choose a textured background for the movie, either a still-image clip or a movie clip.

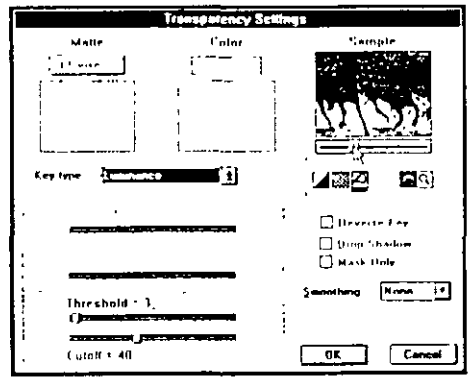


2 Drag the texture clip onto track A, and drag the clip you want to superimpose onto the S1 track.

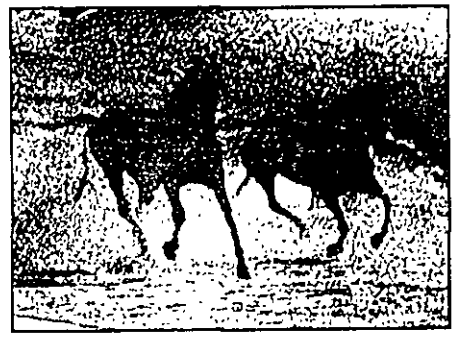


Note: When using a still-image clip for a texture, you can save compiling time by applying filters or effects to the clip in Adobe Photoshop. Then import the still image into Adobe Premiere.

3 Select the clip on the S1 track. Choose Transparency from the Clip menu to display the Transparency Settings dialog box, and select the Luminance key type. Click the page peel icon to preview the effect of the key on the clip on track A. Drag the Threshold and Cutoff sliders to control which gray values are superimposed and to adjust the brightness of the gray values.



4 Preview the results.



Horse footage from CNN

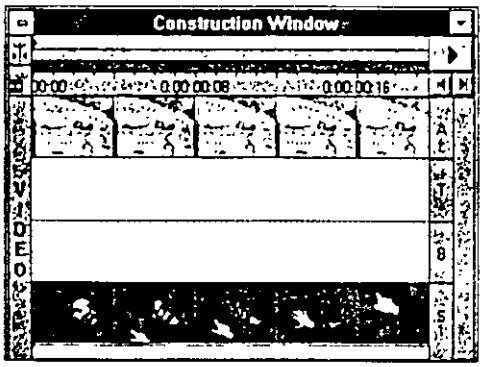
A figure and its shadow are superimposed over a map

Superimposing figures against a background

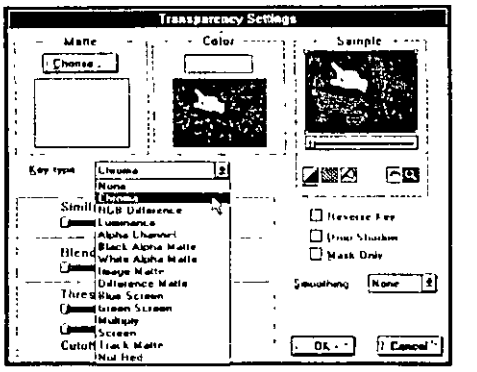
Using the Chroma key type, you can isolate a figure and then superimpose it over a different background.

1 Start by videotaping a figure against a bright, plain background. The background should be a color that contrasts with the figure because the goal is to isolate the figure from the background. This example uses a uniformly lighted, intense blue (called *chroma blue*) background. The blue background works well because skin tones typically contain no blues. The contrast between skin tones and background means that the keying process in Adobe Premiere won't *key out* (that is, make transparent) anything other than the background.

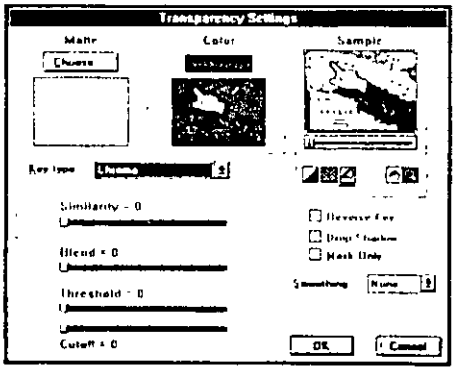
2 Drag the clip of the figure onto the S1 track, and drag a clip of the background you want to use onto track A. You can use anything for the background clip; this example (see step 7) used a still-image clip of a map.



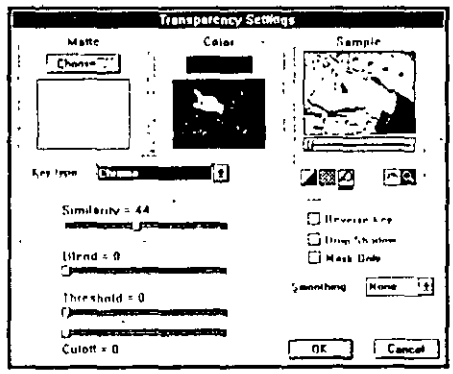
3 Select the figure clip on the S1 t... choose Transparency from the Clip me to display the Transparency Settings dia box. Select the Chroma key type.



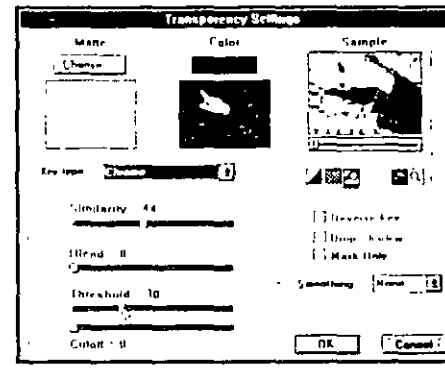
4 Specify the color to key out (in this c... blue); the default masking color is white the Color section of the Transparency Settings dialog box, use the eyedropper tool and click to sample the blue b... k-ground of the clip. The preview in... .e Sample window changes to reflect the sampled color; the areas that appear wh will be the areas through which the clip track A plays. Click the page peel icon t preview the clip through the key.



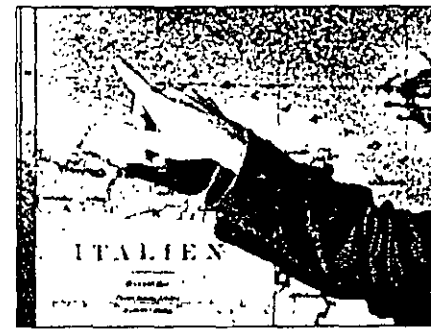
5 Use the Similarity slider to adjust the range of colors that are keyed out. Drag the slider to the right until all of the background appears white in the Sample box. You may need to experiment by sampling different blue pixels from different areas of the Color box, and then readjusting the Similarity slider to see which settings give the best results. Use the Smoothing option to soften the edges between the figure and the keyed-out background. Click the zoom tool, and then click the preview to see the keying effects. The hand tool lets you scroll around the preview.



6 Use the Threshold slider to control how shadows in the clip are keyed out; moving the slider to the right increases the amount of shadow that will be included in the key. Use the Cutoff slider to control the transparency of the shadows.



7 Preview the results.

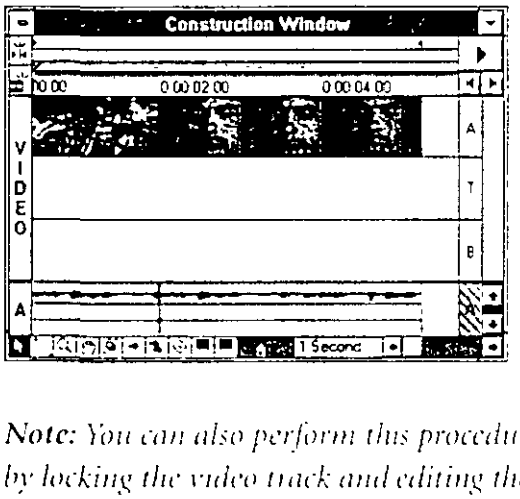


▷ A video clip of artifacts plays while an audio clip of a man talking leads his video.

Creating a split edit

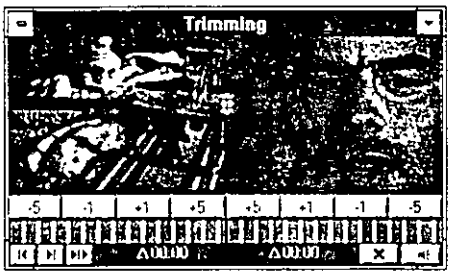
A common edit in video is a *split edit* where, for example, a clip's audio leads the video while another video clip plays on-screen. Starting the second clip's audio before its video produces a more gentle transition. To create a split edit, you lock either the audio or video track, and then edit the unlocked track. This procedure maintains a synchronized link between the audio and video clips.

1 Drag a movie clip that has linked audio onto track A in the Construction window. Drag a second clip that has linked audio onto track A next to the first clip. Lock the audio track by Alt+clicking the track label to the right of the track. Locking the track lets you edit linked tracks independently.



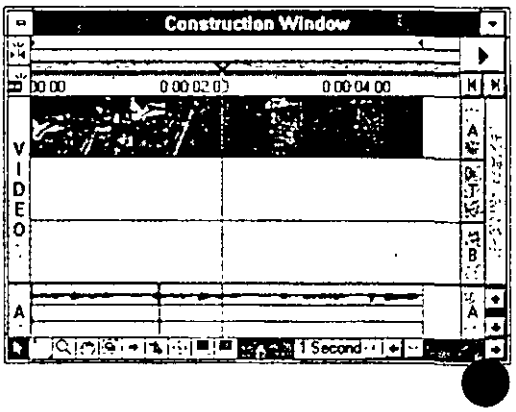
Note: You can also perform this procedure by locking the video track and editing the audio track.

2 To precisely adjust the edit point between the two video clips, open the Trimming window and click the Next E button to view the frames on either side the edit point. To perform a rolling edit (that is, adjust the duration of the adjace clip as you edit the first clip), move the pointer between the two frames and dra left or right to trim the clips. The other clip's duration is shortened or lengthene to offset the adjustment.



Editing breaks the link between th de and audio and inserts a soft link. Once you've made the split edit, a red triangle will appear at the beginning of the clip i the audio and video get out of synch. Resynchronize the clip by clicking the re triangle and dragging to select the amou that appears in the pop-up menu.

3 Unlock the audio track that you locke in step 1.

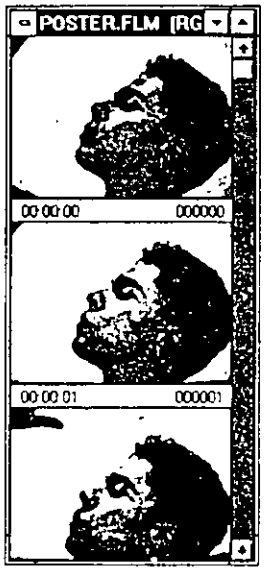


7 Click OK to set the output options; then choose Make Movie from the Make menu.

8 Name the file and click OK.

Note: *Exported filmstrip files lose any audio. Be sure to save the source clip with in and out points if you plan to relink the filmstrip to its original audio.*

9 In Adobe Photoshop 2.5 or higher, open the filmstrip. The filmstrip opens as a series of frames in a column, with each frame labeled with a number and a timecode.



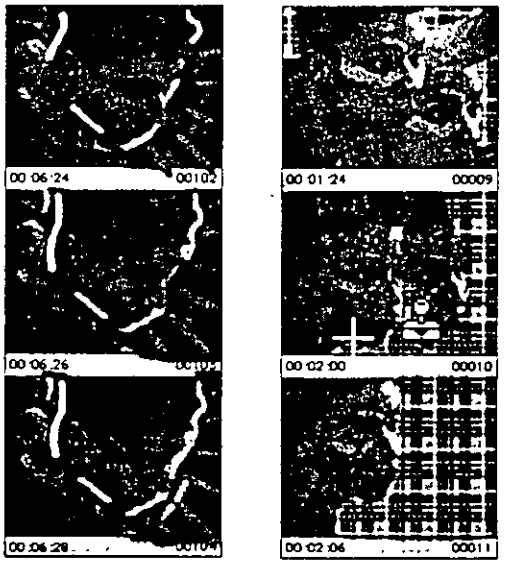
10 Use any of the Adobe Photoshop painting tools to draw on or paint the frames. You must repeat the design over several frames for it to appear when you play the movie. The number of frames to paint depends on the frame rate of your movie.

For example, with a frame rate of 15 fps, you should paint a design in 15 frames to have it play for 1 second. If you selected a Field option in step 6, there will be two filmstrip frames per source frame.

For editing guidelines, see "Modifying Filmstrips in Adobe Photoshop" on page 106.

Adobe Photoshop 2.5 and higher has special commands for moving selections precisely from frame to frame in a filmstrip.

Using any of the Photoshop painting tools, you can retouch flaws in the original footage, or make random marks from frame to frame. You can also use the rubber stamp tool to clone parts of one frame onto another.



This example shows the lasso tool used to select background areas. The areas then were filled with color and patterns.

You can paint over the gray borders between frames. Do not, however, scale or crop the filmstrip.

11 When you have finished painting, save your file in the Filmstrip format.

12 In Adobe Premiere, open the rotoscoped filmstrip in a Clip window, and preview the results. If you created the filmstrip with separate fields in step 6, choose Field Options from the Clip menu, and select the Interlace Consecutive Frames option; this instructs the program to interleave the fields back together.

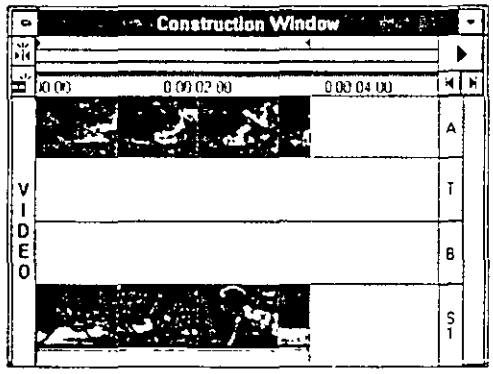
Note: *If you must relink your filmstrip with the audio, drag the original video and audio clip onto a track in the Construction window and cut the video portion. Drag the edited filmstrip clip onto the empty video track, and select both the clip and the audio to create a soft link.*

▶ A clip of clouds in motion plays in the background while a clip of a cyclist plays within a zooming mask of squares.

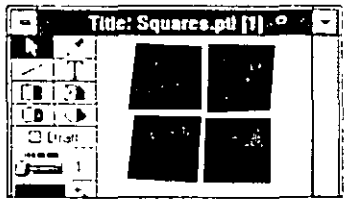
Playing a movie through a traveling matte

This procedure shows how to layer a movie that plays within a moving mask—called a *traveling matte*—on top of a background movie.

1 Start by dragging the clip that will play in the background onto track A in the Construction window. Drag the clip that will play within the moving mask onto the S1 track in the Construction window. Adjust the length of the clips so that they match.



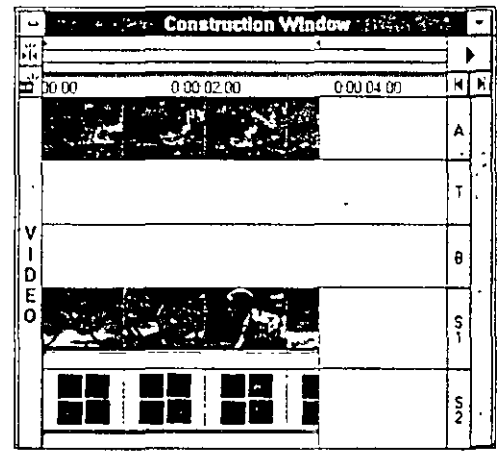
2 Next, create the mask in which you want a clip to play. This example used four simple shapes created with the polygon tool in the Title window; save the title when you have finished.



You can also import a file from Adobe Photoshop for your mask.

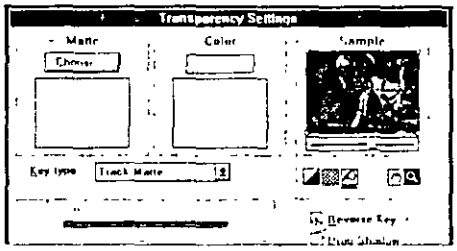
***Note:** When importing files from Adobe Photoshop, you should use either a black-and-white file or grayscale file; color files may produce unexpected results.*

3 To apply the mask to the clip on the S1 track, first make the Construction window active and add another superimpose (S) track by choosing Add/Delete Tracks from the Project menu, and entering 4 in the Total Video Tracks field. This adds a track labeled S2 below the S1 track. Drag the mask clip onto the new S2 track, and adjust its length to match the other clips.

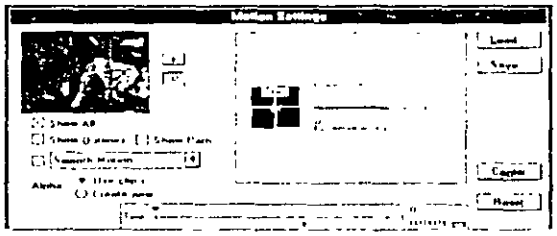


4 Select the movie clip on the S1 track; choose Transparency from the Clip menu to display the Transparency Settings dialog box. Choose Track Matte from the Key Type drop-down list. The Track Matte key type uses the lightest areas of the clip on the track below as a mask, and "tracks" any motion applied to the clip.

Click the page peel icon and drag the slider below the Sample window to preview the effect; the movie clip on track A should appear in the mask, and the movie clip on the S1 track should appear in the background behind the mask. Select Reverse Key to make the movie clip in S1 appear within the mask.

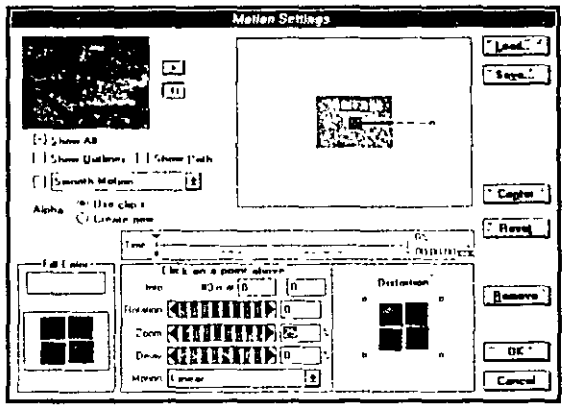


5 Now apply motion settings to the mask to make it move by selecting the mask clip on the S2 track and choosing Motion from the Clip menu. The Motion Settings dialog box appears. Select the Show All option to preview the masked clip in motion. Click the Pause button to freeze the motion.

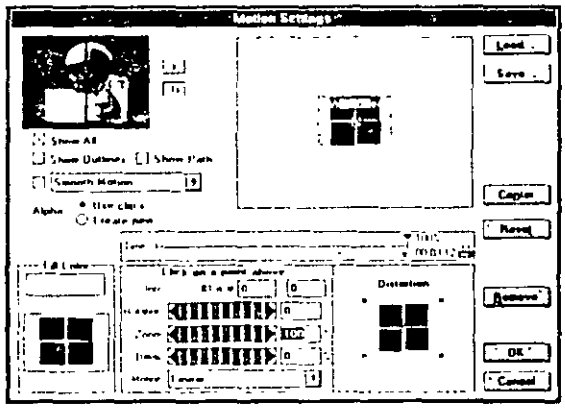


6 Move the Start and Finish points of the motion path, or add points to the path to create the motion you want.

For example, create a zoom effect by selecting the Start point and entering 0 in both coordinate fields to center the Start point in the frame; then apply a zoom of 25 percent to the point.



7 Next, select the Finish point on the path and center it in the frame by entering 0 in both coordinate fields; leave the zoom level at 100 percent. This makes the masked clip appear to zoom in from the center of the background clip.



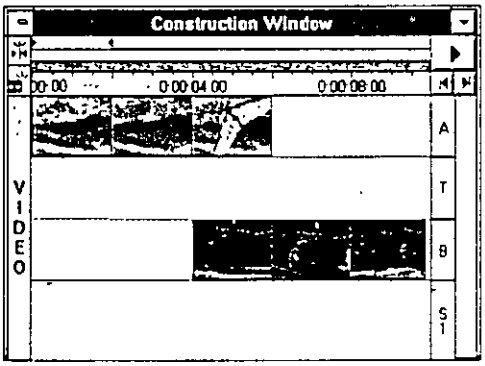
Note: *To select successive points on the motion path when they are positioned precisely on top of each other, press the Tab key.*

One clip of a sports scene makes the transition into another behind a sportscaster.

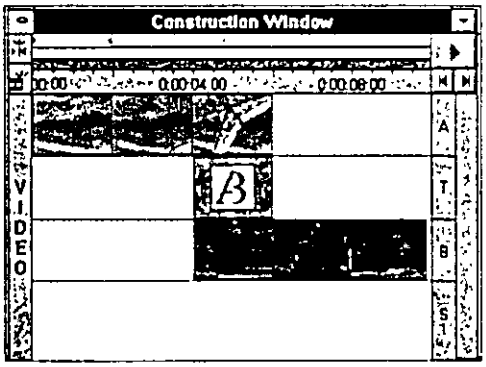
Using virtual clips to nest transitions

This example shows how to use the virtual clip feature to create a transition between two clips that are playing within an inset. A *virtual clip* is a "snapshot" of an area in the Construction window that is used as a clip elsewhere in the Construction window.

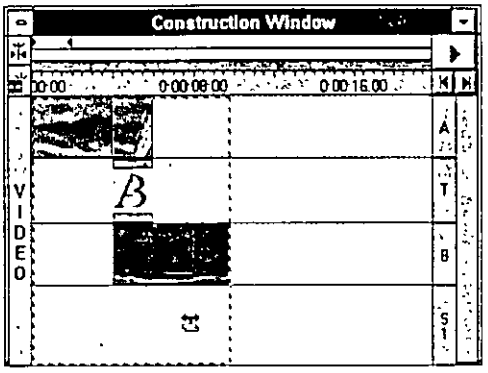
1 Start by importing three clips: one to play as the main movie and two to play in the inset. Drag the first clip for the inset onto track A in the Construction window and drag the second clip for the inset onto track B. Arrange the clips so that they overlap by at least one second.



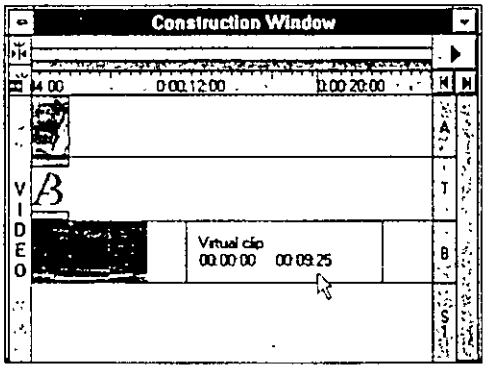
2 Drag the Clock Wipe transition onto track T and align it between the two movie clips. Adobe Premiere automatically adjusts the length of the transition to match the amount of overlap.



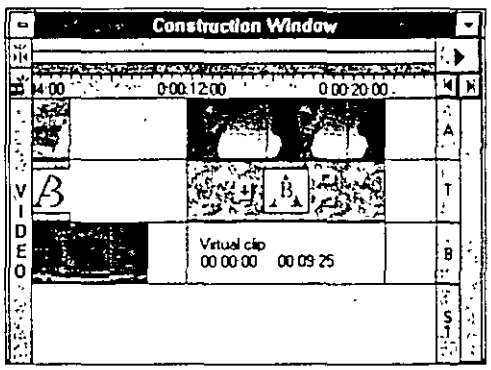
3 To make the clips and transition act as one clip, combine them into a virtual clip. To do so, select the virtual clip tool and drag to select the block of clips and the transition. Then place the pointer inside the selection; it changes to the virtual clip icon.



4 Drag the selected block of clips to an open space on track B. Preview the virtual clip by dragging through the time ruler.

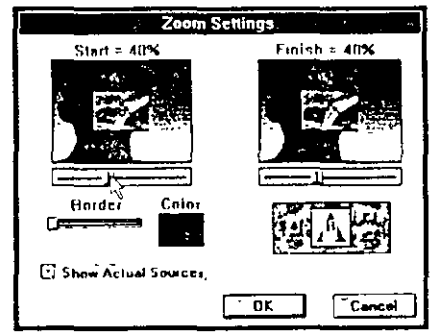


5 Drag the Zoom transition onto the T track above the virtual clip, and adjust the length of the transition to match the length of the virtual clip. Drag the third clip onto track A (this example used footage of a sportscaster), and adjust its length to match the virtual clip and Zoom transition.

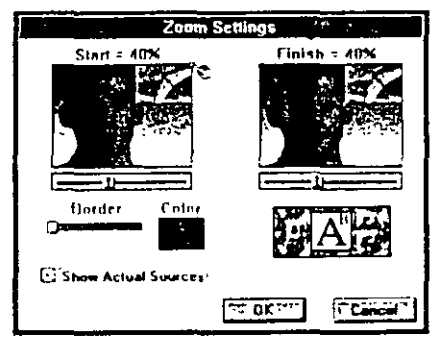


6 Now use the Zoom transition to make the virtual clip play in an inset window. To do so, double-click the Zoom transition to display the Zoom Settings dialog box and select the Show Actual Sources option. Hold down the Shift key and drag the Start slider to the right until the inset window is the desired size; holding down the Shift key causes the End slider to move with the Start slider.

The Zoom transition scales the virtual clip to fit within the inset; setting the Start and End sliders to the same value constrains the zoom inset window to the same size for the duration of the clip.



7 In the center of the Start window, position the pointer over the small square; when the pointer changes to a finger, drag the square to reposition the inset window. Click OK.



8 In the Construction window, adjust the work area bar to extend across the virtual clip and preview the results.

Stock footage from David Banks Film & Video Service

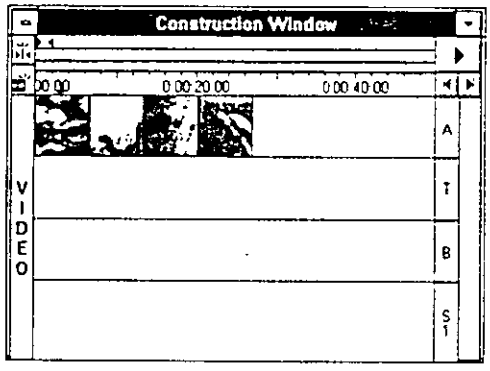
Five clips of sea scenes play simultaneously on the surfaces of a three-dimensional space.

Creating a 360-degree presentation

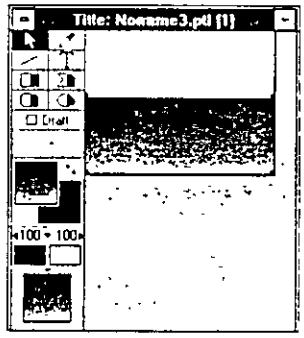
This procedure shows how to use transitions and a series of virtual clips to create a three-dimensional space effect with movies playing on five separate "walls." This two-part procedure requires five clips of equal duration to play on the walls.

In the first part of this procedure, you create gradient fills that will be superimposed over each clip and add dimensionality to the final movie.

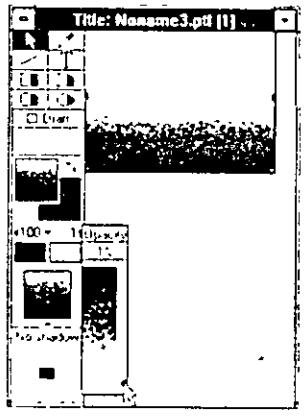
1 Start by dragging the clip that will play on the ceiling onto track A and align the clip with the start of the time ruler; then drag the next three clips onto track A in the following order: floor, right wall, and left wall. Leave the clip that will play on the back wall in the Project window.



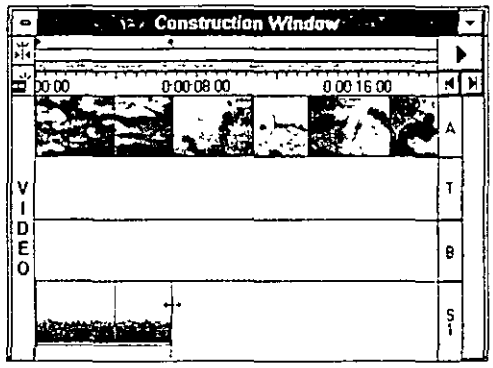
2 Next, create a grayscale gradient that will be superimposed over the clips. Open a new Title window by choosing New > Title from the File menu. Set the gradation start color to black and the gradation end color to a medium gray. Then use the filled rectangle tool to draw a rectangle that covers the lower half of the window.



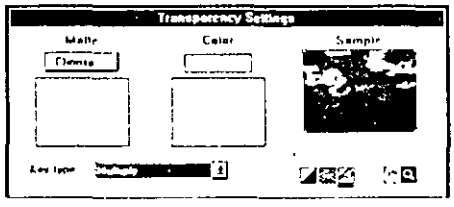
3 Reverse the direction of the gradient by clicking the triangle at the bottom center of the gradient swatch; change the opacity of the gradient end color to 1 percent by clicking the right triangle above the end color swatch and dragging the gradient swatch to 1 percent. Save the title as *ceiling.ptl*.



4 Drag the title onto the S1 track in the Construction window, aligning its left edge with the beginning of the project. Stretch the right edge of the title clip until its duration matches the ceiling clip on track A.

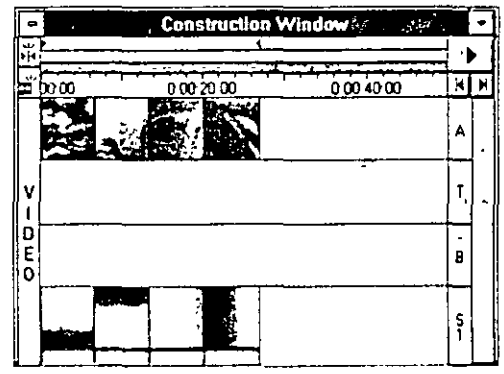


5 With the title clip selected, choose Transparency from the Clip menu to display the Transparency Settings dialog box. Apply the Multiply key type. Click the page peel icon below the Sample window to preview the key applied to the clip. The clip is darkened at the bottom where the superimposed gradient is black and changes to its actual color gradually where the gradient is gray and then white.



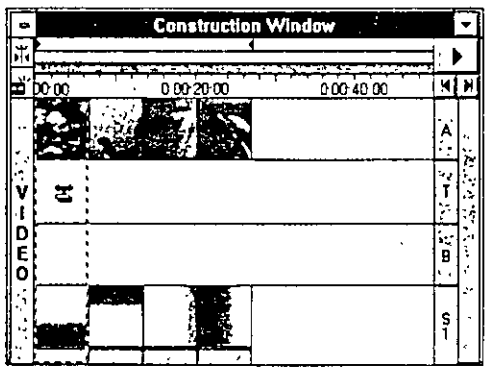
When the clip plays on the "ceiling," the shading makes the clip appear darker as it recedes to the back wall.

6 Repeat steps 2 through 5 to create three additional superimposed gradients for the other walls of the room. Use the triangles located along the sides of the gradient swatch to change the direction of the gradients as follows: the gradient for the floor clip should start with black at the top and fade to 1 percent opacity in the middle; the right wall gradient should start with black on the right side and fade to 1 percent opacity in the middle; the left wall gradient should start with black on the left side and fade to 1 percent opacity in the middle.

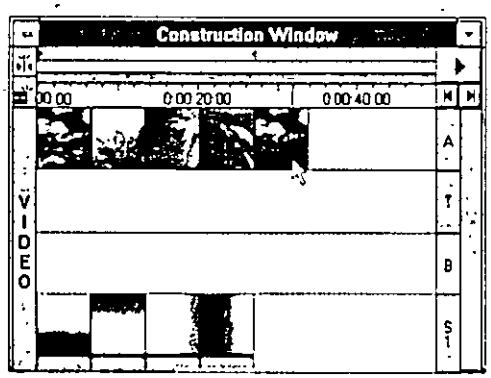


In the final part of the procedure, you use the virtual clip feature with the four clips to build the three-dimensional movie.

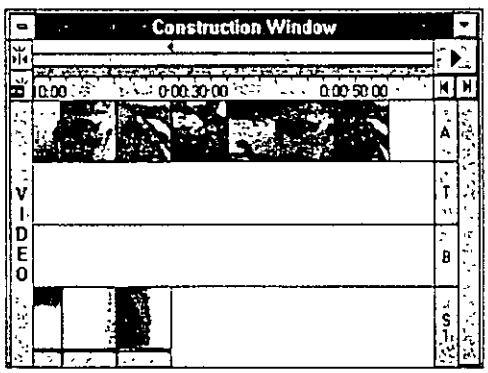
7 Select the range select tool, and drag to select just the ceiling clip on track A and its superimposed gradient on the S1 track. Move the pointer inside of the selection; the pointer changes to the virtual clip icon.



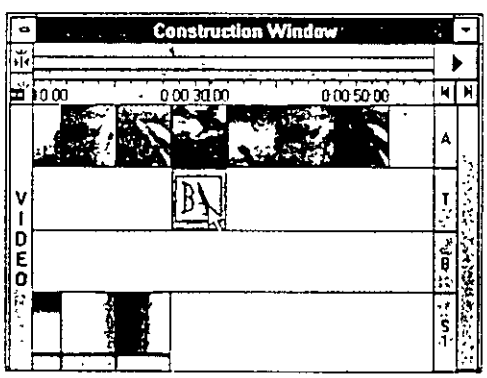
8 Drag the selection onto the blank space at the end of track A. The two clips are composited as a virtual clip.



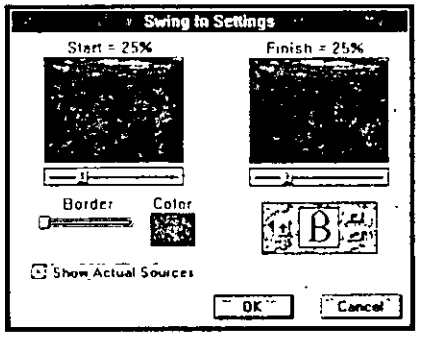
9 Repeat steps 7 and 8 for each clip and it superimposed gradient, placing the virtu clips on track A in the same order as the source clips.



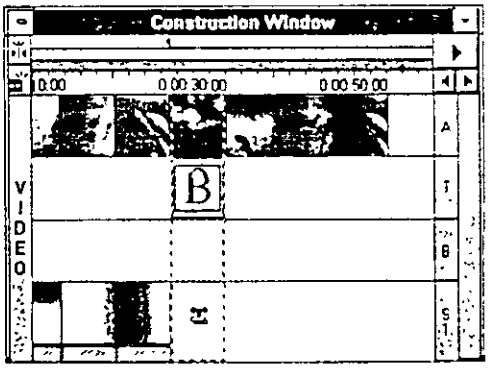
10 To make the first virtual clip appear t play on the ceiling, drag the Swing In tra sition from the Transitions window onto the T track in the Construction window. Adjust the transition's duration to match the first virtual clip on track A.



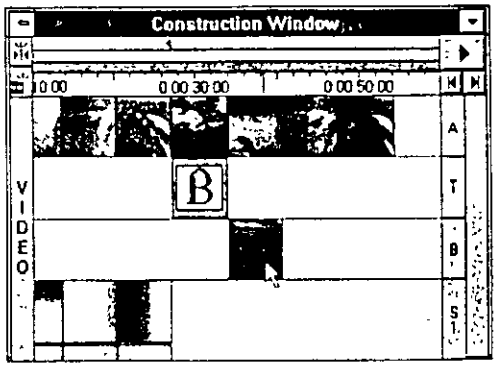
11 Double-click the Swing In transition to display the Swing In Settings dialog box. Select the Show Actual Sources option. Hold down the Shift key and drag the Start slider to 25 percent. (Holding down the Shift key adjusts the Start and End sliders simultaneously, keeping the effect constant throughout the clip.) Click the track selector so that the blue arrow points up; then click the top edge selector to make the clip play on the ceiling.



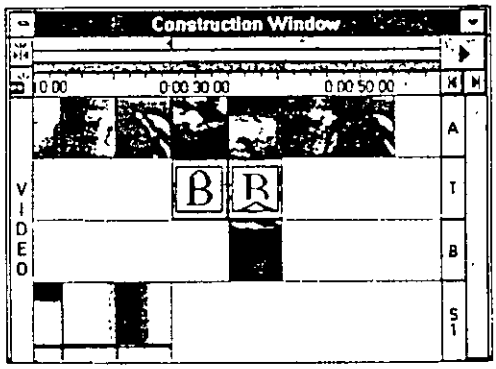
12 Using the range select tool, drag to select the first virtual clip and the Swing In transition.



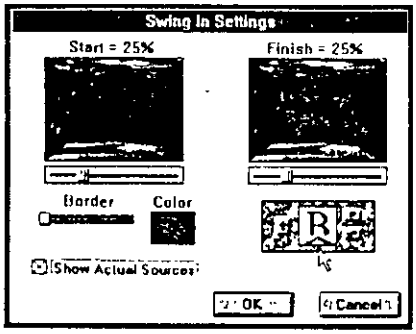
13 Drag the block of clips onto track B, creating a new virtual clip, and align its in point with the end of the Swing In transition.



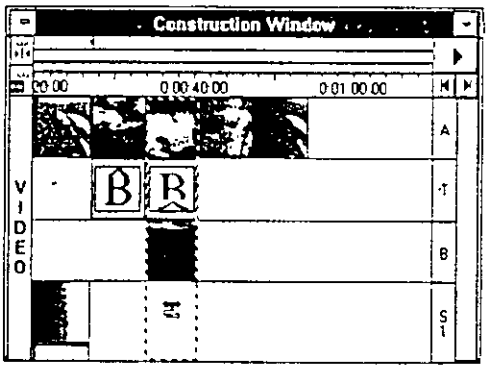
14 To create the floor and combine it with the ceiling, select the Swing In transition on the T track, copy it, and paste the copy onto the blank area of the T track next to the original.



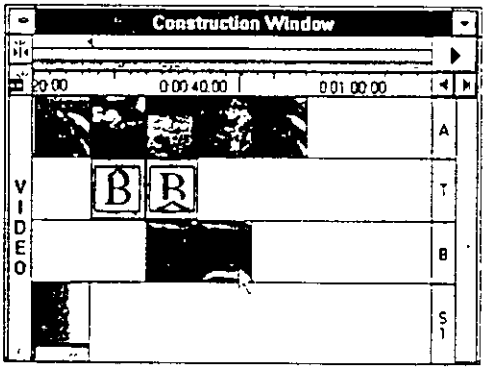
15 Double-click the copied Swing In transition, displaying the Swing In Settings dialog box, and select the Show Actual Sources option. Click the bottom edge selector, and click OK.



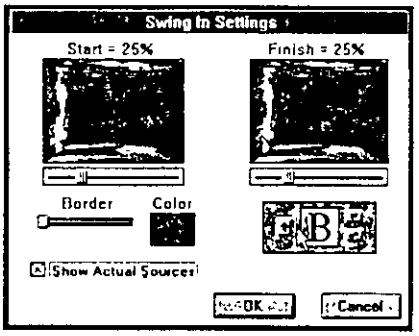
16 Using the range select tool, drag to select the second column of clips containing the ceiling and floor clips.



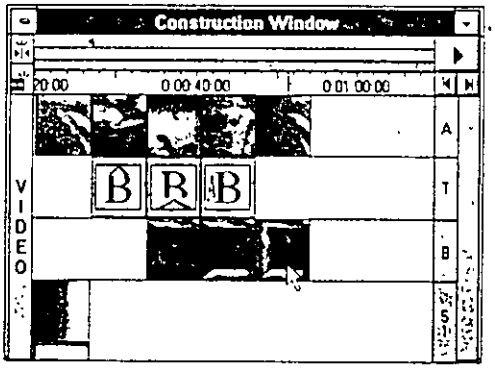
17 Drag the column of clips onto the blank space on track B, next to the ceiling virtual clip, to create a second virtual clip on track B.



18 Paste a third copy of the Swing In transition onto the T track. In the Swing In Settings dialog box, select the Show Actual Sources option, and click the left edge selector.

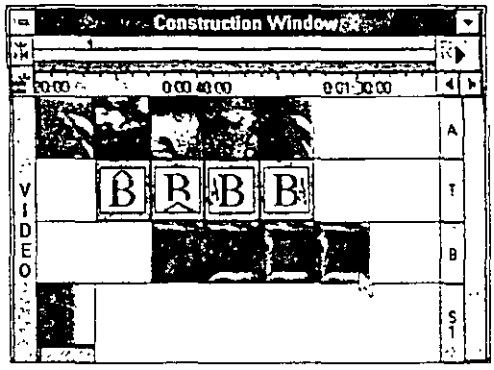


19 Use the range select tool to select the third column of clips containing the ceiling, floor, and left wall clips. Drag the selection onto the blank space on track B to create a third virtual clip.

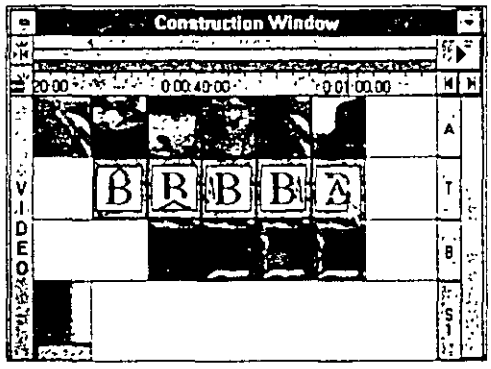


20 To create the right wall of the movie, paste a fourth copy of the Swing In transition next to the third copy on the T track. In the Swing In Settings dialog box, select the right edge selector.

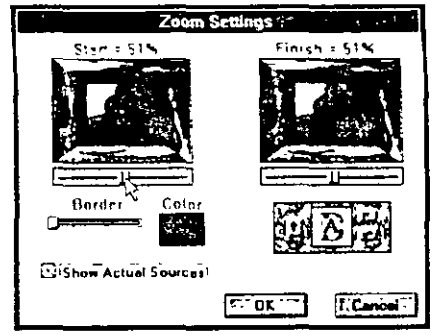
21 Use the range select tool to select the entire column containing the last Swing In transition, and drag the fourth and final virtual clip onto the empty space at the end of track B.



22 To make the back wall of the movie, drag a new clip from the Project window onto track A, and align the clip's start and end points with those of the last virtual clip in track B. Drag the Zoom transition from the Transitions window onto the T track between the new clip and the last virtual clip. Adjust the duration of the transition to match the clips.



23 Double-click the Zoom transition to display the Zoom Settings dialog box. Select the Show Actual Sources option, and click the track selector so that the arrow points up. Hold down the Shift key, and drag the Start slider to 51 percent.



24 Adjust the work area bar so that it covers only the column containing the back wall clip and the last virtual clip. Preview the movie.

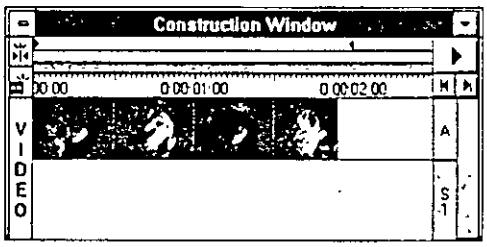
You can substitute different clips for the walls and ceiling of your movie using the Paste to Fit command. The virtual clips are automatically updated to reflect the new source clips.

A logo and other graphic elements are animated and superimposed over a movie of a spinning globe.

Animating graphics

This procedure shows how to create animated graphics in the Title window and then superimpose them over movie clips using motion settings.

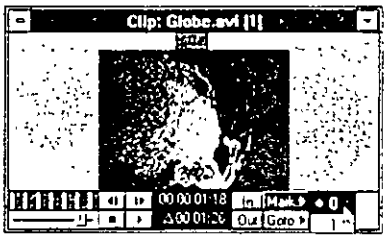
1 Start by dragging a movie clip onto track A in the Construction window. Choose Construction Window Options from the Windows menu. In the Construction Window Options dialog box, select the Video and Superimpose track display options.



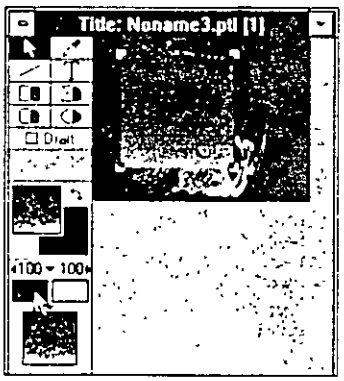
2 Open a new Title window by choosing New > Title from the File menu.

3 To use a frame of the movie clip in the background for positioning the title, open the movie clip in a Clip window and drag the clip into the Title window. The first frame of the clip appears in the background; it does not become part of the title clip.

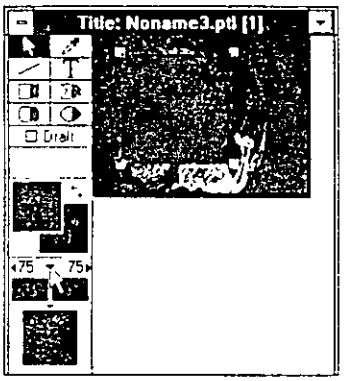
4 To change the clip frame appearing in the background, scroll through the movie to locate the desired frame in the Clip window, and then assign marker 0 to the frame. The frame in the Title window is automatically updated to that frame.



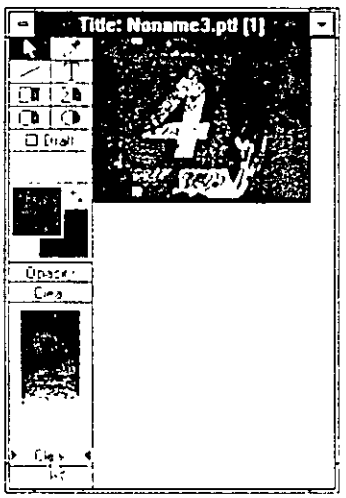
5 Use the Title window tools to create the graphic elements. Draw a square with the filled rectangle tool by holding down the Shift key as you drag. Create a color gradient by clicking the small rectangular swatch to the left of the palette to display the color picker, and select a start color.



6 Complete the gradient by clicking the small rectangular swatch to the right of the palette and selecting an end color. Set the opacity of the square by positioning the pointer on the triangle between the two small swatches, and dragging to the desired value.

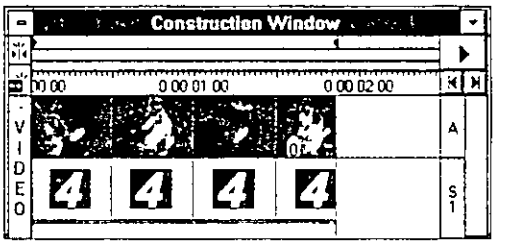


7 To create transparent effects, add elements and set their fill opacity to clear. For example, use the type tool to layer a number over the top of the square, and then set its opacity to clear.

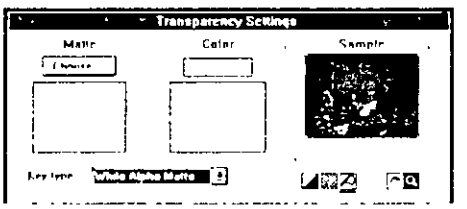


8 To center the elements in the window, choose Center Horizontally or Center Vertically from the Title menu. Deselect the elements.

9 To superimpose the title over another clip, save the title, and then drag it onto the S1 track in the Construction window. Adjust the length of the title clip to match the movie clip.

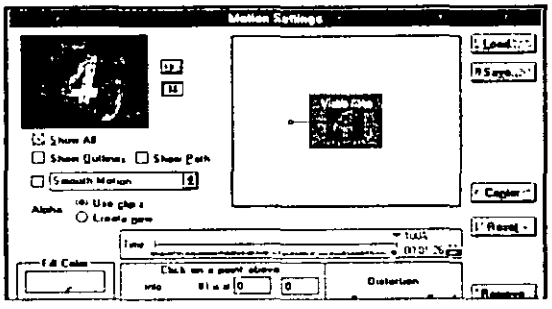


10 With the title clip selected, choose Transparency from the Clip menu to display the Transparency Settings dialog box. Select an appropriate key type. (White Alpha Matte was used for this example.) Click the page peel icon to preview the key.

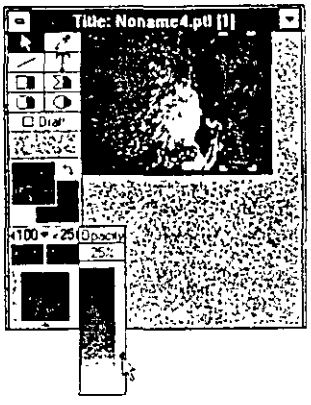


Note: When applying motion in Adobe Premiere 4.0, the program automatically selects the key type using a best guess.

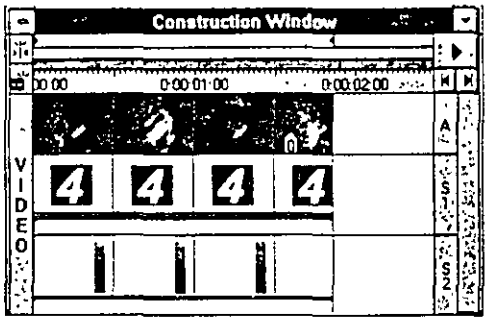
11 To animate the title, select it in the Construction window and choose Motion from the Clip menu. In the Motion Settings dialog box, select the Show All option to see the title superimposed over the clip. Click Pause next to the preview window to freeze the motion. Click the Finish point (right end) of the motion path and move it into the Visible Area; the preview window updates to show the repositioning of the finish point. To center the finish point within the frame, enter 0 in both Info fields below the time line. Positioning the Start and Finish points as shown makes the title roll in from the left.



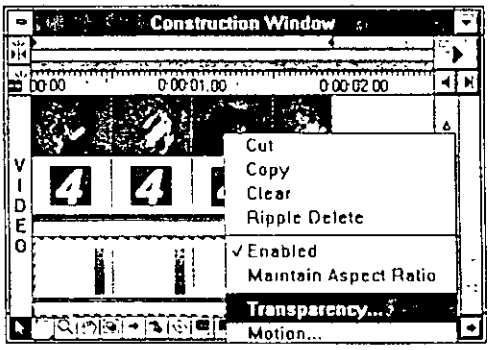
12 Create an additional graphic element in a new, separate Title window. In this example, a rectangle was created with a gradient fill. To make the gradient appear to fade into the background clip, set the opacity to a low percentage.



13 Add an additional S track to the Construction window by choosing Add/Delete Tracks from the Project menu and entering 4 in the Total Video Tracks field. Drag the second title onto the new S2 track, and adjust the length of the clip to match the others.

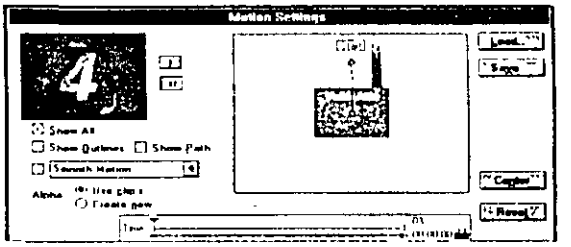


14 To apply a key type to the title without opening the Transparency Settings dialog box, position the pointer over the clip in the Construction window and press Shift+Alt. Click the clip to display a pop-up menu, and drag to select a key type.



15 Select the second title clip in the Construction window and choose Motion from the Clip window to display the Motion Settings dialog box. Select the Show All option to preview the background movie clip, including the first superimposed graphic.

16 Click the Pause button to freeze the animation. Click the Finish point of the motion path, and drag to reposition it. As you drag, the preview changes to show the positioning of the background movie and each superimposed graphic. Set the Start and Finish points as shown in the following illustration to make the rectangle roll in from the top and land precisely next to the first graphic.



17 Create additional graphics using the Title window, and add additional S tracks for superimposing the graphics.

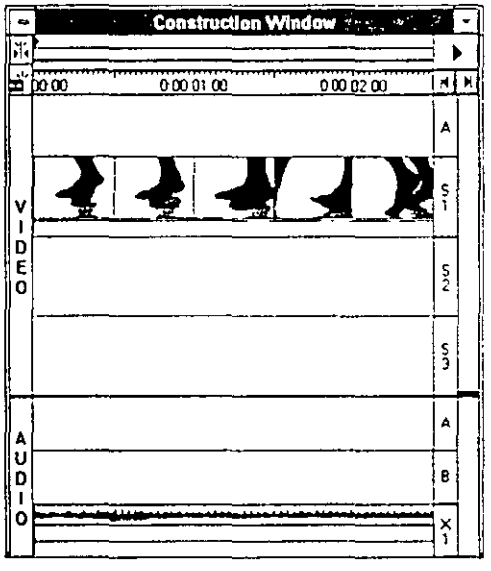
18 Preview the results.

Three clips shot from different camera angles are combined using S tracks.

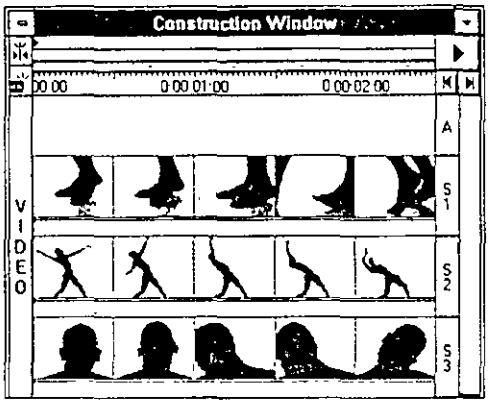
Making multicamera edits

You can use this technique to edit several movie clips of the same subject shot simultaneously from different camera angles, or to edit several clips that share the same audio. In this procedure, you'll use only the S tracks and adjust the fade controls to cut between the different views while preserving the audio.

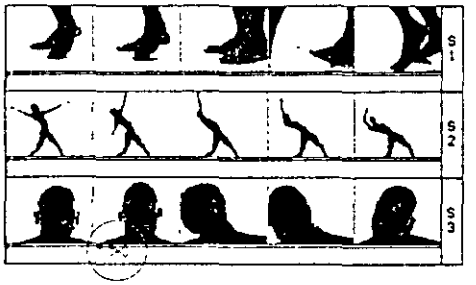
1 Start in the Construction window by adding additional S tracks using the Add/Delete Tracks command from the Project menu. To display three S tracks, set the total number of video tracks to 5. Leave the number of audio tracks at 3. In the Construction Window Options dialog box, deselect the Transitions/Track B display option; make sure that the other Track Display options are selected. Drag the first clip onto the S1 track. The audio portion appears on the X1 track. (Leave track A empty.)



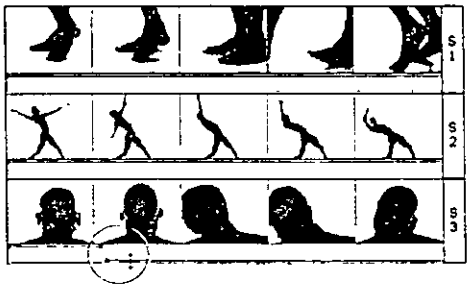
2 To copy only the video part of the second clip (with identical audio), hold down Shift+Alt, select the clip's video thumbnail in the Project window, and drag the clip onto the S2 track. Repeat this step for the third video clip.



3 Click the Fade control to create handles (black dots), and drag the handles to create visual cuts from one clip to the next. By default, clips on higher numbered S tracks dominate lower numbered tracks. To drop the fade level to 0 percent and reveal the S2 track underneath, use the fade scissors tool (in the extended tools pop-up menu); click the bottom of the S3 track to create two new handles close together.



4 Use the fade adjustment tool to move the segment uniformly, and drag the right segment to the bottom of the bar. This changes the fade level to 0 percent, to reveal the S2 track underneath when you preview.

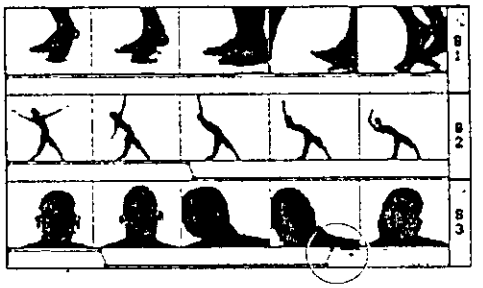


You can use the Info window to see the exact Fade Level percentage as you make changes.

Note: *The distance between the handles (the black dots) determines the fade rate between clips. For a more gradual fade, spread the handles apart. To cut directly to the next clip, click using the fade scissors tool from the extended tools pop-up menu. Gradual fades take more time to preview.*

5 To fade from the clip on the S2 track to the clip on the S1 track, move the pointer slightly to the right in the Fade control section at the bottom of the S2 track and repeat steps 3 and 4.

6 To fade from the clip on the S1 track back to the clip on the S3 track, move the pointer slightly farther to the right in the Fade control section at the bottom of the S3 track. Return the fade level on the S3 track to 100-percent opacity by repeating steps 3 and 4 and dragging the newly created segment to the top of the bar.



7 Preview the effect by clicking the Play button.

Note: *Adobe Premiere does not have to process a preview when a clip on the S track is set to 100-percent opacity. The program treats such a clip as if it were on track A and the only clip in the preview.*

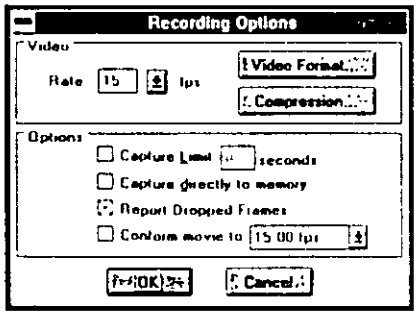
Using low-resolution clips to construct a movie

You can save an enormous amount of processing and compiling time, as well as hard disk space, by capturing and using low-resolution versions of clips to create movies in Adobe Premiere. You can use the smaller and faster low-resolution clips for all editing and effects, and then replace the clips with higher resolution versions once you have made all editing decisions.

This procedure requires batch-capturing video with device control. For more information about batch capturing, see "Batch Capturing with Device Control" on page 241.

1 As an optional time-saver, create a batch list for your original source tape by choosing Capture > Batch Capture or Movie Capture from the File menu. The Batch Capture or Movie Capture menu appears in the menu bar.

2 Choose Recording Options from the Batch Capture or Movie Capture menu. In the Recording Options dialog box, set the frame size to a dimension smaller than what you will use in your final movie. For a full-frame movie, the recommended dimensions are 320-by-240 pixels, or 240-by-180 pixels.



3 Before you make the first capture, be sure to calibrate your timecode to ensure that the movies are accurately stamped with the timecode. Add the timecode during capture using device control or by manually entering the timecode.

4 Choose Video Source from the Batch Capture or Movie Capture menu; set the Compressor to the compressor related to the capture card. Although you can use any compression for the low-resolution version, it's best to use Motion JPEG hardware compression, if you have it. Set the Quality between Low and Normal, or set a lower data rate if your board supports data rate limiting.

5 Set the Frame Rate to the same rate that you will use in your final high-resolution movie. (You can halve the frame rate if you need to save space and only need to be accurate within +1 or –1 frame.) Digitize the low-resolution clips using the Capture command.

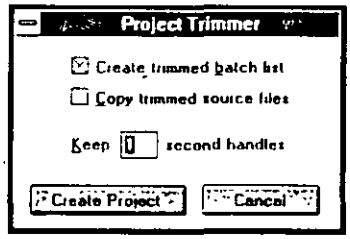
6 Using the low-resolution clips, construct the movie by opening a new project. Choose a preset that matches the library of movies that you created by batch digitizing. Create any stills at their final dimensions; create titles at any size—they will be resized automatically when you compile the movie. Store the stills and titles in a separate folder from the low-resolution movies that will be replaced. Later in this procedure (in steps 11 and 12), you'll replace the clips with high-resolution versions.

7 Drag the clips into the Construction window for editing.

8 Save the project.

9 Delete any clips in the Project window that you didn't use by choosing Remove Unused from the Project menu.

10 Choose Tools > Project Trimmer from the File menu. In the Project Trimmer dialog box, select the Create Trimmed Batch List option. Deselect the Copy Trimmed Source Files option; you don't need copies because you will redigitize the clips. To avoid dropped frames at the beginning and ending of clips, accept the default of Keep Handles at 1 second. Click Create Project. Name the new project and click OK; name the batch list and click OK.



Note: Adobe Premiere adds a suffix of _1, _2, _3, and so on to the clip names in the new batch list to distinguish them from the original clip names. When you reconstruct the high-resolution clips, the new project looks for the original clips based on the clip names in the new batch list. Do not change either the original or the new clip names until you have successfully reconstructed the project.

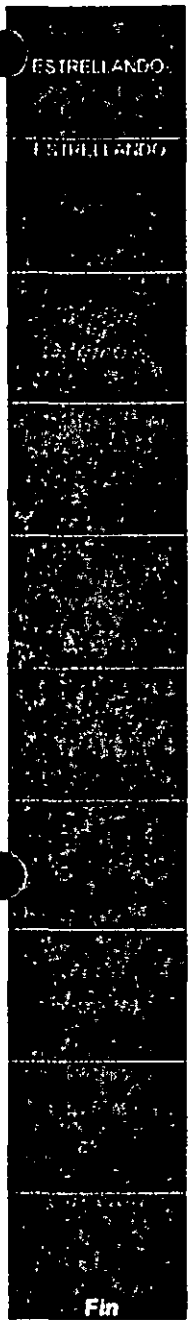
11 Edit the batch list, if necessary, to remove any references to clips that you do not want to redigitize. Choose Recording Options from the Batch Capture or Movie Capture menu, and set the size and quality desired for your final movie. (Usually, you would choose a size of 640-by-480 pixels and high quality.)

12 Redigitize the video using the new batch list.

13 Open the project created by the project trimmer in step 10. If prompted, locate the new high-resolution clips. Load a new preset with the final options, or change the preview and output options.

14 Preview the project with the same settings you'll use in your final movie.

15 Choose Make Movie from the Make menu to compile the final high-resolution movie.



▸ A continuous stream of credits rolls through the screen from bottom to top.

Creating rolling credits

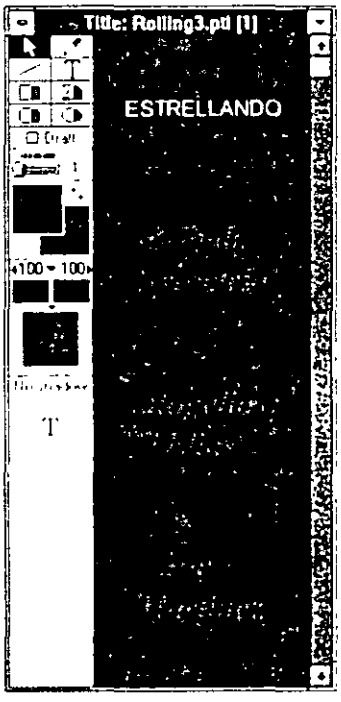
This procedure shows how to use the Image Pan filter and the Title window to create rolling credits.

1 Choose New > Title from the File menu.

2 Right-click the Title window bar to open the Title Display Options dialog box.

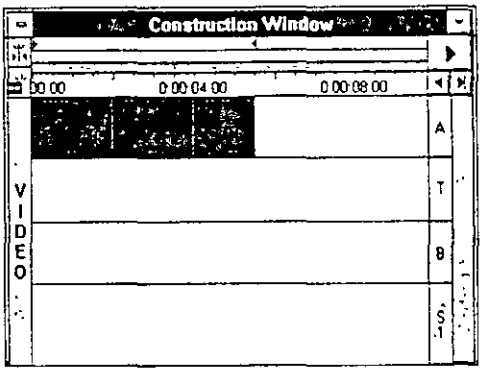
3 Deselect the 4:3 Aspect Ratio option and enter a drawing size that has the same width as that of your Adobe Premiere movie (as set in the Output Options dialog box) and enough height to create the necessary text for your credits. This example uses a box measuring 160 -by-720 pixels.

4 Use the type tool to add credits. Format the type as desired.



5 Save the title.

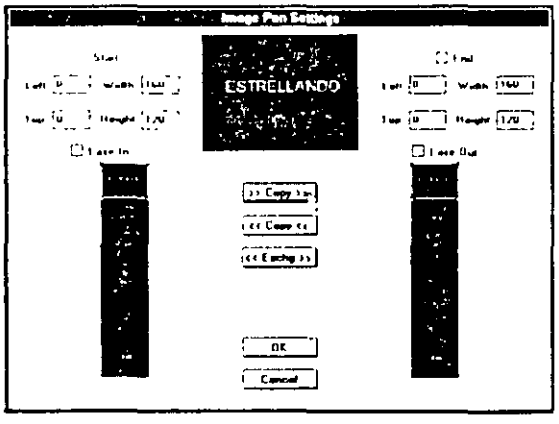
6 Drag the title clip onto a track in the Construction window. Adjust the duration of the clip to reflect the length of your credits.



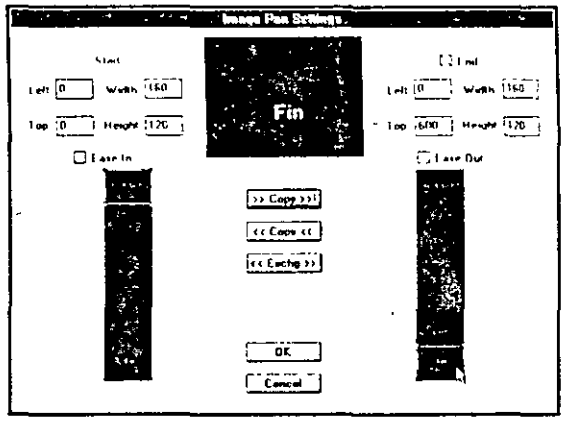
7 Select the title clip in the Construction window. Choose Maintain Aspect Ratio from the Clip menu.

8 Choose Filters from the Clip menu to display the Filters dialog box, and select the Image Pan filter.

9 In the Image Pan Settings dialog box, enter 120 for the Start height; leave the Width as 160. A rectangle appears at the top of the Start image. Click Copy to copy the rectangle dimensions to the End settings.



10 Place the pointer inside the rectangle for the End settings and drag the rectangle to the bottom of the End image. The animated preview at the top of the dialog box shows the clip being panned from top to bottom.



11 Click OK to apply the filter to the clip. Adjust the work area bar in the Construction window, and preview the clip to view the rolling credits effect.

You can adjust the duration of the clip as desired to make the credits roll faster or slower. If you are using a particularly long list of credits, you may want to divide it into several title files to make the files more manageable.

You can also superimpose rolling credits over a moving video by creating type and graphics in the Title window and positioning the title clip on the S track. Use the White Alpha Matte key type to superimpose just the type or graphics over the movie on the video track.

Appendix A: Video Basics

This appendix provides a basic introduction to analog and digital video. Like film, video is a sequence of individual images, called *frames*, projected on a screen before a viewer. Projecting several images per second creates the illusion of a motion picture because the brain cannot register the individual images. With a frame rate typically ranging from 24 frames per second (fps) to 30 fps, video projects motion that appears smooth and continuous. Normally, one or more audio tracks are synchronized with the video frames to provide sound to the movie.

RECORDING AND ENCODING ANALOG VIDEO

This section discusses how video cameras record video signals, including how video cameras interpret color and measure the resolution of video signals.

Conventional video cameras contain light-sensitive devices called *charge-coupled devices* (CCDs), which digitize or *capture* the individual images as optical images and convert or *encode* them into electrical signals. Once an analog video signal has been encoded by the camera, it can be broadcast, recorded onto analog videotape, or recorded digitally onto a disk storage device. The electrical signals captured by a video camera represent the color and brightness information of the image. Cameras are rated, among other things, by their characteristic color response and image resolution.

How video cameras interpret color

Video cameras interpret color as a combination of the three additive primaries: red, green and blue. This light-based color model is commonly referred to as *RGB* color. Video cameras differ in how they encode this color information into a video signal. Some high-end cameras process separate signals for each of the RGB components, or they process signals for the chrominance (color) and luminance (brightness) information, which results in a *component* video signal. A more common process encodes the RGB and luminance information into one signal, known as a *composite* signal.

In the United States and Japan, the standard composite signal adopted by the television and video industries is the National Television Standards Committee (NTSC) signal. An NTSC signal has a frame rate of 30 fps (or, more precisely, 29.97 fps). In Europe, the most common composite video signal is PAL (Phase Alternating Line), which has a frame rate of 25 fps.

Image resolution

Another important concept in describing a video signal is *image resolution*, which measures the quality of a video image based on the number of picture elements, called *pixels*, that make up the image.

A projected video image is a conglomeration of pixels that project the color and brightness of the image. Picture quality increases as the number of pixels increases in a unit area of the image. A video camera encodes the image information as a grid of pixels, much like a collection of tiles in a mosaic. An NTSC video frame contains 486 horizontal lines of visible pixels, with each line containing 720 pixels. Thus, an NTSC video frame is made up of approximately 350,000 pixels (486 x 720).

Displaying the video signal

For the analog video signal to be converted to a recognizable image, the signal must be run through a decoder. The decoder splits a composite signal into RGB signals so that the image can be displayed on-screen. Television screens are made up of tiny phosphors that emit varying intensities of red, green, and blue light when struck by a carefully controlled electron beam. For a standard television signal to be projected, the electron beam must scan across 525 lines on the screen 30 times every second. In actuality, the electron beam scans a television screen in *interlaced* mode—that is, the beam scans all the even lines of a frame and then all odd lines of that frame. The even lines and the odd lines of each frame are referred to separately as *fields*. To maintain a frame rate of 30 fps, the electron beam must scan at a rate of 60 fields per second. When you freeze on a video frame, you actually see the two fields being alternately scanned on the NTSC monitor.

A computer screen operates in *noninterleaved* mode. That is, the electron beam scans all rows of phosphors sequentially to create the image on-screen and repeats the process about 60 to 75 times per second to refresh the screen.

SMPTE timecode

The duration of a video clip and its starting and ending frames are commonly measured using a unit or address called *timecode*. Timecode identifies each frame of a videotape for control in editing and broadcasting. When you are editing video, timecode allows you to locate frames accurately and to synchronize picture and audio elements (also called *frame accurate* synchronization).

The timecode used by the Society of Motion Picture and Television Engineers (SMPTE) identifies each frame with a unique address in the form hours:minutes:seconds:frames. A clip with a duration of 00:02:31:15 plays for 2 minutes, 31 seconds, and 15 frames. At the rate of 30 fps, a clip with a duration of 00:02:31:15 plays for 2 minutes and 31.5 seco

There are several SMPTE timecode standards targeted for the different frame rates used in the film, video, and television industries. For technical reasons involved with broadcasting, the NTSC adopted a standard of 29.97 fps rather than the 30 fps originally used in early black-and-white television programming. The SMPTE timecode for NTSC video assumes a frame rate of 30 fps, which results in a 0.1 percent discrepancy between real playing time and the timecode's duration measurement.

To address the discrepancy between the playing time measured by SMPTE timecode and real playing time, the *drop-frame* format was developed. With drop-frame timecode, two frame counts are dropped (actual frames are not dropped) from the count every minute, for 9 out of every 10 minutes. The *nondrop-frame* timecode ignores this discrepancy and thus is not duration accurate.

Most video-editing systems handle both drop-frame and nondrop-frame timecode formats. While you can use either format, it is important to know which format was used in recording your video source material and to edit your videotape using the same format throughout so that you know how real time is being represented.

DIGITIZING VIDEO

NTSC and PAL video signals are analog in nature. Computers, however, display information digitally. So NTSC and PAL video signals must be digitized, or *sampled*, before they can be used by the computer. The process of digitizing video is commonly called *capturing*. A video-graphics adapter (often called a frame grabber or video capture board) is used to digitize an analog video signal and convert it into a computer graphics signal.

Note: *There are many video capture boards on the market, and they differ widely in their features and capabilities. It is beyond the scope of this document to rate video boards.*

Digital recording of a video signal requires substantial amounts of disk storage because the color and brightness information for each pixel in every image frame must be stored. A full-screen image on a 13-inch computer monitor measures 640-by-480 pixels. Thus, each full-screen frame of video contains 307,200 (640 x 480) pixels. To display the full-screen image in 24-bit color, each pixel must represent 24 bits of information (or 8 bits per RGB component). Twenty-four bits of information are equal to 3 bytes. That figure multiplied by a full-screen, 307,200-pixel image results in a storage requirement of 921,600 bytes for each frame of digitized video. At a frame rate of 30 fps, storing 1 second of digitized NTSC video requires more than 27 megabytes! Such use of disk space to store digitized video is not feasible for most computer users.

An even bigger obstacle is the computing power required to play back the stored information at sufficient frame rates. Bringing video to the desktop computer has involv advances in data compression technology and compromises in frame size, color depth, and image resolution. By far, the most important advances to date have occurred with th way the data is compressed. (For more information, see "Digital Video Compression" in Chapter 8.)

DISPLAYING AND OUTPUTTING DIGITAL VIDEO

Once a video signal has been digitized and compressed, it can be manipulated and organized in much the same way that still images are manipulated in image-editing programs such as Adobe Photoshop. In fact, many of the graphics tools found in Adobe Photoshop, such as image adjustment, filters, and text generators, are available in Adobe Premiere. The major difference with the digital processing of video is the time-based aspect of the medium.

Desktop video became popular on desktop computers when Apple Computer released its QuickTime system software extension and Microsoft released its Video for Windows standard. Video for Windows and QuickTime movies are stored on disk as files, and can be played by applications designed to support Video for Windows or QuickTime, such as Adobe Premiere.

Outputting the video image

To output a digital image to videotape requires several conversions. The video board encoder first converts the color of each pixel from the digital color standard of RGB to the television color standard, which represents a color as a combination of hue and saturation. The digital information is converted to an analog waveform, and the encoder then adds calibration pulses to the data and outputs a standard NTSC video signal.

Some video capture boards now available on the market have the capability of outputting black-and-white or color NTSC signals to videotape.

DIGITIZING AUDIO

Audio is an important component of most media productions. Like video, analog sound must be digitized, or sampled, to be used with videotape. Fortunately, audio is not nearly as hard to digitize as is video. Sampling analog sound breaks up the sound into discrete frequencies. There are two steps in digitizing audio—setting the audio level controls to avoid distortion and setting the audio resolution or quality.

The quality (or *resolution*) of digitized audio and the size of the audio file depend on the sampling rate and bit depth of the audio. The *sampling rate*, similar to the frame rate for digitizing video, measures the number of frequencies into which the sound is broken. The *bit depth*, similar to color depth, measures the number of tones per sample. The higher the sampling rate and bit depth, the better the sound quality. Audio sampled at 11 kHz and 8-bit resolution is similar to mono sound, and audio sampled at 22 kHz and 16-bit resolution (which requires twice the file size for the audio clip) is similar to stereo or CD sound. CD audio is normally digitized at 44 kHz and 16-bit resolution.

Appendix B: Expressions for Creating Transitions and Filters

The Adobe Premiere program lets you create your own transitions and filters. This appendix explains how to set up the arithmetic expressions that describe what the transition or filter will do. Using the Transition Factory to create transitions is described in Chapter 5, "Using Transitions." Using the Filter Factory to create filters is described in Chapter 6, "Using Filters and Motion Settings."

ABOUT DIGITAL IMAGES

A digital video image is a conglomeration of tiny picture elements, called *pixels*. Pixels project the color and brightness of the image. Each pixel in an image is uniquely identified by its coordinates. The first coordinate is the horizontal position of the pixel, and the second coordinate is the vertical position of the pixel. The horizontal coordinates start counting at the left edge of the image and increase as you move to the right. The vertical coordinates start counting at the top of the image and increase as you move down. Therefore, the top left corner of the image has the coordinates (0,0). The range of coordinates for an image depends on its resolution.

In RGB format, the color of a pixel is stored as three numbers: the amount of red, the amount of green, and the amount blue. The three color values are called *channels*. Channel values can range from 0 to 255.

- If a channel value is set to 0, none of its color is present in the pixel.
- If a channel value is set to 255, the maximum amount of that color is present in the pixel.

For example, if a pixel has the channel values (255,0,0), the pixel is entirely red: 255 red, 0 green, 0 blue.

- If all three channels have the same value, the pixel is a shade of gray. For example, (80,80,80) is a dark gray, (128,128,128) is a medium gray, and (200,200,200) is a light gray.
- If all three channels are 0, the pixel is black. If all three channels are 255, the pixel is white.

The transitions and filters you create affect the channel values of the pixels in an image. You specify an expression for each channel, and each operation is performed on the appropriate channel for every pixel in the image. Expressions can include specific pixel coordinates whose channel values are evaluated and used in the calculation.

Note: *If an expression evaluates to a number greater than 255, the channel is set to 255. Likewise, if an expression evaluates to a number less than 0, the channel is set to 0.*

COMPONENTS OF EXPRESSIONS

A transition or filter performs an operation on the channels of each pixel in an image. These channel operations are described by arithmetic expressions. Expressions are made up of combinations of four types of components: constants, variables, functions, and operators. The following sections describe these four components. For a quick reference of all allowable variables, functions, and operators, see "Expression Reference" on page 297.

The Transition Factory and Filter Factory allow only integer numbers in expressions—no fractions or decimal numbers are allowed. Variables and functions will always evaluate to integers.

Constants

A constant is a number that is supplied directly in the expression. Constants can be used to construct simple expressions such as 10+5, and these expressions can always be replaced by another constant; in this case, 15.

Constants can also be written in hexadecimal form. To use hexadecimal values, prefix the number by 0x, as in 0xaf10.

Variables

A variable is a short name, such as *x*, that can be evaluated. The value of a variable depends on the current image, the current pixel, or the current channel for which an expression is being evaluated. For example, the variable *x* always evaluates to the horizontal coordinate of the current pixel, and the variable *y* always evaluates to the vertical coordinate. The variables for the current pixel's channel values are *r* (red), *g* (green), and *b* (blue).

If you are creating a transition, you specify whether you are affecting the first image or the second image. To do so, include a 0 or a 1 with the variable. For example, *r*0 is the red channel value for the current pixel in the first image, while *r*1 is the red channel value for the current pixel in the second image.

You can combine variables and constants to form expressions. For example, the expression *r+g* retrieves the red and green channel values for the current pixel and adds them together.

Functions

Functions are short names that can be evaluated and that require one or more arguments. For example, the rnd function (random function generator) requires two arguments. It evaluates to a number that is greater than or equal to the first argument and less than or equal to the second argument. The expression rnd(1,10) evaluates to a number between 1 and 10, inclusive. (The rnd function is useful for adding noise or texture to an image.)

Arguments are written within parenthesis and are separated by commas. The arguments can be expressions. For example, the expression rnd(*r*–10,*r*+10) evaluates to the red channel of the current pixel, plus or minus 10.

Another function, src (source), retrieves channel values for a particular pixel. It requires three arguments: the horizontal coordinate of the pixel, the vertical coordinate, and the channel index. The index for the red channel is 0; the green channel is 1; the blue channel is 2. For example, the expression src(10,20,0) retrieves the red channel value for the pixel at coordinates (10,20). The expression src(*x*,*y*,0) retrieves the red channel value for the current pixel. The expression src(*x*+1,*y*,0) retrieves the red channel for the pixel to the right of the current pixel.

The available functions are described in the section "Expression Reference" on page 297.

Operators

The operators include all of the arithmetic components that can be used in an expression. There are five types of operators: basic, relational, logical, conditional, and bitwise.

Basic operators

The basic operators are +, –, *, /, and %. The % (modulo) operator calculates the remainder of a division. For example, the expression 11%3 evaluates to 2.

Relational operators

The relational operators are <, <=, >, >=, ==, and !=. These operators compare two expressions and evaluate to 0 (false) or 1 (true). For example, the < operator evaluates to 1 if the expression on the left is less than the expression on the right. The expression *r*<*g* evaluates to 1 when the red channel of the current pixel has a lower value than the green channel. Otherwise, it evaluates to 0.

The == operator evaluates to 1 when the two expressions surrounding it evaluate to the same thing. The != operator evaluates to 1 when the two expressions surrounding it evaluate to something different. For example, the expression 1==1 evaluates to 1, and the expression 2==1 evaluates to 0. The expression 1!=2 evaluates to 1, and the expression 1!=1 evaluates to 0.

Logical operators

The logical operators are &&, ||, and !. These operators let you combine several relational expressions. For example, you could evaluate whether the horizontal coordinate of a pixel is between 10 and 30, inclusive. The appropriate relational expressions are x>=10 and x<=30. You can use the logical && operator to combine them into the single expression (x>=10)&&(x<=30). The && operator evaluates the expressions on both sides. If neither expression evaluates to 0, the && operator evaluates to 1. If either expression evaluates to 0, the && operator evaluates to 0.

The logical operator || is similar to the operator &&, but it performs a slightly different logical operation. The || operator is also placed between two relational expressions. If either of the expressions evaluate to anything but 0, the || operator evaluates to 1. If both expressions evaluate to 0, the || operator evaluates to 0. For example, the expression (x>10||(y>10) evaluates to 1 when the horizontal coordinate is greater than 10. The only time this expression evaluates to 0 is when the horizontal coordinate is <=10 and the vertical coordinate is <=10. The following table shows the difference between the && and || operators:

LEFT EXPRESSION	RIGHT EXPRESSION	LEFT&&RIGHT	LEFT||RIGHT
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

Finally, you place the ! operator before an expression to invert the expression's evaluation. If the expression evaluates to 0, the ! operator evaluates to 1. If the expression evaluates to anything but 0, the ! operator evaluates to 0.

Conditional operator

The single conditional operator ? lets you make a choice between two alternatives. A conditional expression includes a condition expression and two alternative expressions. The conditional operator evaluates the condition expression and uses the result to decide

which of the two alternatives it should evaluate. If the conditional expression evaluates to anything but 0, the first alternative is evaluated. If the conditional expression evaluates to 0, the second alternative is evaluated.

For example, in the expression (*x*%2)?*r*:*g*, the ? conditional operator separates the condition expression (*x*%2) from the two alternative expressions *r* and *g*. The alternative expressions are separated by a colon (:). The condition expression divides the horizontal coordinate of the current pixel by 2 and returns the remainder of the division. If the horizontal coordinate is an odd number, the result is something other than 0, and if the horizontal coordinate is an even number, the result is 0. Therefore, if the pixel has an odd horizontal coordinate, the conditional operator returns the value of the red channel. If the current pixel has an even horizontal coordinate, the conditional operator returns the value of the green channel.

Bitwise operators

The bitwise operators are &, |, ^, ~, <<, and >>. These operators directly manipulate the bits in a value. You place the &, |, and ^ operators between two expressions. The & operator performs a logical-and operation on the corresponding bits of the evaluated expressions; the | operator performs a logical-or; and the ^ operator performs a logical-exclusive-or. The ~ operator takes only one expression, and it performs a logical-not on each bit of the evaluated expression.

The << and >> expressions are placed between two expressions. Both operators shift the bits in the left expression's evaluation by some number, which is specified by the right expression's evaluation. The << operator shifts bits to the left. The >> operator shifts bits to the right.

PROVIDING USER-CONTROLLED SLIDERS

When you create a transition or filter, you can provide up to eight slider controls for the user to adjust when applying the effect. Slider values can range from 0 to 255. You set up the effect's sliders by using the ctl (control), val (value), and map (mapping) functions in your expressions.

- The ctl function retrieves the specified slider's current value. This function requires one argument: the slider control index, which is a number between 0 and 7. For example, the expression ctl(0) evaluates the current value of the first slider.

• The val function converts the range of possible slider values (always 0 to 255) into a range that you specify. For example, to get a value between 1 and 100 from a slider, you would use the expression val(0,1,100). If slider 0 is set to 0, the slider value evaluates to 0. If slider 0 is set to 255, the slider value evaluates to 100. Slider values between 0 and 255 are converted into values between 1 and 100.

• The map function groups the sliders into pairs. Each even/odd slider pair sets the values in a table, which is accessed by the map function. There are four mapping tables—one for each slider pair. Sliders 0 and 1 set the values for mapping table 0; sliders 2 and 3 set the values for mapping table 1, and so on. Each table contains 256 entries, which are calculated each time the slider values change.

The map function takes two arguments: the table index and the item index. For example, the expression map(1,20) returns item 20 from table 1. The table index must be between 0 and 3. The item index must be between 0 and 255, inclusive.

If you use the these functions to retrieve slider information, you should set up the Slider or Map options in the Transition Factory's or Filter Factory's Build Custom dialog box. For information on using the Build Custom Transition dialog box, see "Creating Custom Transitions" on page 138. For information on using the Build Custom Filter dialog box, see "Creating Custom Filters" on page 163.

EXAMPLES

This section provides several examples of using expressions to achieve a result. The examples are presented in the order of their complexity. The Adobe Premiere program also provides some sample transition and filter expressions. These samples have been saved as text files and are located in a directory in your Adobe Premiere directory. You can use the Transition Factory or Filter Factory to load a sample file and observe its effect.

Affecting a single channel (filter)

To make an image more red, you could use the following expressions:

A: 0
R: r+100
G: g
B: b

The second expression evaluates the red channel of each pixel and adds 100 to each one. The next two expressions evaluate the other two channels and leave them unchanged.

Affecting channels using sliders (filter)

To add a user-controlled slider value to the current channel values, you could use the following expressions:

A: 0
R: r+ctl(0)
G: g+ctl(1)
B: b+ctl(2)

The second expression evaluates the red channel of each pixel and adds the value of slider 0 to each one. The next two expressions do the same thing to the green and blue channels, using the values of slider 1 and slider 2, respectively.

Adding noise to channels using slider and random values (filter)

To use slider values to determine the range of random numbers, you could use the following expressions:

A: 0
R: r+rnd(–ctl(0),ctl(0))
G: g+rnd(–ctl(1),ctl(1))
B: b+rnd(–ctl(2),ctl(2))

The filter defined by these expressions adds noise to all three channels. The amount of noise in each channel is determined by the slider controls. The second expression evaluates the slider setting from slider 0. This value is used as the argument for the rnd function. If the slider setting is 0, the rnd function evaluates to 0. If the slider setting is 100, the rnd function can return any number between –100 and 100, inclusive. The result of the rnd function is then added to the current value of the red channel. As the slider setting is raised from 0 to 255, the random numbers are selected from a wider and wider range, resulting in more and more noise being added to the red channel.

The last two expressions perform the same operation on the green and blue channel, using sliders 1 and 2 for input, respectively.

Amplifying or toning down channels (filter)

To amplify or tone down a channel based on the values of a different channel, you could use the following expressions:

A: 0
R: (b>100)?r+50:r–50
G: g
B: b

The second expression evaluates the blue channel to determine if it is greater than 100. If it is greater than 100, the entire expression evaluates to the red channel value plus 50. If it is not greater than 100, the expression evaluates to the red channel value minus 50. The other two expressions do nothing. Therefore, this filter amplifies the red channel if there is more blue than you want, or it tones down the red channel if there is less blue than you want.

You could also use slider values in a similar type of filter, as follows:

```
A: 0
R: (b>ctl(0))?r+ctl(1):r–ctl(1)
G: g
B: (b>ctl(0)?b–ctl(1):b+ctl(1)
```

The second expression uses the setting from slider 0 as a "cutoff" value. If the blue channel is greater than the cutoff value, the red channel is amplified by the value of slider 1. If the blue channel is less than the cutoff value, the red channel is toned down by the value of slider 1. The fourth expression is the opposite of the first one, but it works on the blue channel instead of the red channel. The effect is that anything that is added to the red channel is subtracted from the blue channel, and vice versa.

Dissolving between two images (transition)

To create a simple cross dissolve between the first clip and the second clip, you could use the following expressions:

```
A: mix(c1,c0,t,total)
R: mix(c1,c0,t,total)
G: mix(c1,c0,t,total)
B: mix(c1,c0,t,total)
```

The first expression combines the current value of the alpha channel in the first clip with the current value of the alpha channel in the second clip by using the fraction time/total time. The remaining three expressions do the same thing for the current values of the R, G, and B channels.

Averaging the channel values of neighboring pixels (filter)

You can use the src (source) function to retrieve the channel values from neighboring pixels and average them, as follows:

A: 0
R: (src(x–1,y,0)+src(x,y,0)+src(x+1,y,0))/3
G: (src(x–1,y,1)+src(x,y,1)+src(x+1,y,1))/3
B: (src(x–1,y,2)+src(x,y,2)+src(x+1,y,2))/3

The second expression uses the src function to retrieve the red channel value for three different pixels: the pixel to the left of the current pixel, the current pixel, and the pixel to the right of the current pixel. These three values are added together and then divided by 3. The last two expressions do the same thing using the green and blue channels, respectively.

Pushing the second image into the first image (transition)

To create a transition that would "push" the second image into the first image from left to right, you could use the following expressions:

A: 0
R: x*1024/xmax<t*1024/total?src0(xmax+x–t*xmax/total,y,p):src1(x–t*xmax/total,y,p)
G: x*1024/xmax<t*1024/total?src0(xmax+x–t*xmax/total,y,p):src1(x–t*xmax/total,y,p)
B: x*1024/xmax<t*1024/total?src0(xmax+x–t*xmax/total,y,p):src1(x–t*xmax/total,y,p)

In each of these expressions, the comparison before the question mark determines the image used to sample pixels. The two expressions after the question mark select the correct pixel for each image based on the percentage of the time that has passed for the clip.

EXPRESSION REFERENCE

This section provides a summary of all operators, variables, and functions that you can use in Transition Factory and Filter Factory expressions.

Operators

You can use the following operators in your expressions. The operators are presented in their order of precedence. Precedence determines which operators are evaluated first within an expression when the order of evaluation is ambiguous. For example, in the expression 2+3*4, the * operator is evaluated first because it has higher precedence than the + operator.

OPERATORS	DEFINITIONS
!, ~	Logical not, bitwise not
+, -	Add, subtract
*, /, %	Multiply, divide, modulo
<<, >>	Shift left, shift right

OPERATORS	DEFINITIONS
<, <=, >, >=	Less than, less than or equal to, greater than, greater than or equal to
==, !=	Equal to, not equal to
&, ^, |	Bitwise and, bitwise exclusive or, bitwise or
&&, ||	Logical and, logical or
?:	Conditional

- The arithmetic operators +, –, *, /, and % operate on signed, long integers that are 32 bits wide.
- The logical operators &&, ||, and ! treat all expressions as either true or false. Any value other than 0 is considered true, and only a 0 value is considered false.
- The shifting operators (<< and >>) perform logical, not arithmetic, shifts so the sign of the shifted operand is not preserved.

Variables

You can use the following variables in your expressions. When creating a transition, append a 0 to variables describing values for the clip that plays first (such as *x*0 for the horizontal coordinate of the current pixel in the first image). Append a 1 to variables describing values for the clip that plays second (such as *x*1 for the horizontal coordinate of the current pixel in the second image).

VARIABLES	DEFINITIONS
r, g, b	Red, green, and blue channel values for the current pixel
a	Alpha channel value for the current pixel
c	Value of the current channel, whichever channel the expression is defining
i, u, v	Calculated channel values for the current pixel in YUV space
x, y	Coordinates of the current pixel
p	Channel index for the current expression
d	Direction (angle) of the current pixel from the center of the image, where *d* is an integer between 0 and 1024, inclusive
m	Distance (magnitude) from the center of the image to the current pixel
t	Current time
total	Maximum time
xmin, xmax	Range of horizontal coordinates over the width of the image

VARIABLES	DEFINITIONS
ymin, ymax	Range of vertical coordinates over the height of the image
pmin, pmax	Range of channel indexes within one pixel
dmin, dmax	Range of angles within the image, where *dmin* is always 0 and *dmax* is always 1024
mmin, mmax	Range of magnitudes with the image, where *mmin* is always 0 and *mmax* is always one half the diagonal size of the image

• The *i*, *u*, and *v* variables do not exist in an RGB image, so they are calculated from the RGB channels. Because this calculation takes some time, using these variables is slower than using the *r*, *g*, and *b* variables. The following formulas are used to convert from RGB to YUV:

i=((76*r)+(150*g)+(29*b))/256
u=((−19*r)+(−37*g)+(56*b))/256
v=((78*r)+(−65*g)+(−13*b))/256

• The *xmin* and *xmax* variables return the range of possible values for the *x* variable. The *ymin* and *ymax* variables return the range of possible values for the *y* variable. The *pmin* and *pmax* variables return the range of possible values for the *p* variable. These ranges are closed on the minimum and open on the maximum: *xmin*<=*x*<*xmax*, *ymin*<=*y*<*ymax*, and *pmin*<=*p*<*pmax*.

Functions

You can use the following functions in your expressions. Many functions place restrictions on the possible values of their arguments. If an argument is out of range, the expression will return a 0. For example, the expression ctl(8) evaluates to 0 because the ctl function requires an argument between 0 and 7.

When creating a transition, append a 0 to source functions (src, cnv, and rad) describing values for the clip that plays first. (For example, the expression src0(10,20,0) evaluates to the red channel value for the pixel at coordinates (10,20) in the first image.) Append a 1 to source functions describing values for the clip that plays second. (For example, the expression src1(10,20,0) evaluates to the red channel value for the pixel at coordinates (10,20) in the second image.)

FUNCTIONS	DEFINITIONS
src(*x,y,p*)	Channel p for the pixel at coordinates x,y
cnv(...)	Convolution of neighboring channel values

FUNCTIONS	DEFINITIONS
rad(*d,m,p*)	Channel value of pixel *p* in the source image, which is *m* units away, at an angle of *d*, from the center of the image
ctl(*i*)	Value of slider *i*, where *i* is an integer between 0 and 7, inclusive
val(*i,a,b*)	Value of slider *i*, mapped onto the range *a* to *b*
map(*i,n*)	Item *n* from mapping table *i*, where *i* is an integer between 0 and 3, inclusive, and *n* is and integer between 0 and 255, inclusive
min(*a,b*)	Lesser of *a* and *b*
max(*a,b*)	Greater of *a* and *b*
abs(*a*)	Absolute value of *a*
add(*a,b,c*)	Sum of *a* and *b*, or *c*, whichever is greater
sub(*a,b,c*)	Difference of *a* and *b*, or *c*, whichever is greater
dif(*a,b*)	Absolute value of the difference of *a* and *b*
rnd(*a,b*)	Random number between *a* and *b*, inclusive
mix(*a,b,n,d*)	Mixture of *a* and *b* by fraction *n*/*d*
scl(*a,il,ih,ol,oh*)	Scale *a* from input range (*il* to *ih*) to output range (*ol* to *oh*)
sqr(*x*)	Square root of *x*
sin(*x*)	Sine of *x*, where *x* is an integer between 0 and 1024, inclusive
cos(*x*)	Cosine of *x*, where *x* is an integer between 0 and 1024, inclusive
tan(*x*)	Tangent of *x*, where *x* is an integer between 0 and 1024, inclusive
r2x(*d,m*)	x displacement of the pixel *m* units away, at an angle of *d*, from an arbitrary center
r2y(d,m)	y displacement of the pixel *m* units away, at an angle of *d*, from an arbitrary center
c2d(*x,y*)	Angle displacement of the pixel at coordinates *x,y*
c2m(*x,y*)	Magnitude displacement of the pixel at coordinates *x,y*

• The src (source) function is slow compared to the other operators and functions. Several evaluations of the src function in one expression can noticeably slow down the processing of an image. The coordinates passed to the src function should be within the ranges specified by the *xmin,ymin* and *xmax,ymax* variables; otherwise, the coordinates will be pinned.

• The cnv (convolution) function retrieves the channel values of the pixel adjacent to the current pixel and scales them by the arguments. The adjacent pixels are determined by a 3-by-3 pixel grid with the current pixel in the center. The first nine arguments to the cnv function correspond to the channel values of these nine pixels.

The cnv function multiplies each channel value by its corresponding argument, adds the products together, and divides the result by the tenth argument in the list. For example, the expression cnv(–1–2,–1,–2,16,–2,–1,–2,–1,4) scales the channel values as follows:

-1	-2	-1
-2	16	-2
-1	-2	-1

The channel values of the current pixel, in the center of the grid, are scaled by 16; the channel values of the pixels directly above, below, to the left, and to the right of the current pixel are scaled by –2; and so on. All of these products are then added together, and the result is divided by 4. The effect of this expression is to sharpen the image's channel values.

• The val (value) function converts the requested slider setting into a value in the requested range. The slider setting is multiplied by the size of the range (b–a) and offset by the start of the range (a). This function is useful when the range returned by the sliders (always 0 to 255, inclusive) does not match the range of values you want to use. For example, if the requested range is 1 to 10, a slider setting of 0 returns a value of 1, a setting of 255 returns a value of 10, and a setting of 127 returns a value of 5.

The start of the requested range does not have to be less than the end of the range. For example, the expression val(0,10,–10) returns values between 10 and –10.

• The map (mapping) function uses tables that are constructed according to the slider settings. Each table uses a pair of sliders: table n uses sliders $2n$ and $2n+1$ for the high and low values, respectively. The table is constructed as follows, where L is the value of the low slider, H is the value of the high slider, and I is an entry: if $I<=L$, use 0; if $I>=H$, use 255; if $L<I<H$, use $(I-L)*255/(H-L)$.

• The rnd (random) function returns a different random number each time it is called, but the entire function resets each time an image is processed. As a result, a transition or filter that uses the rnd function will have the same effect each time it is used on the same image.

- The mix (mixture) function combines the two input values using the specified fraction. A fraction of 1/2 returns the average of the two input values. A fraction close to 1 returns the first input value, and a fraction close to 0 returns the second input value. The mix function is defined as $a*n/d+b*(d-n)/d$.
- The scl (scale) function maps a value from an input range onto an output range. For example, an input range of 0 to 255 could be mapped onto an output range of –100 to 100 by the expression scl(c,0,255,–100,100). In this example, channel values close to 0 are mapped starting at –100, and channel values close to 255 are mapped up to 100.
- The r2x and r2y functions convert radial expressions to cartesian expressions. The c2d and c2m functions convert cartesian expressions to radial expressions.

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