WaveS: Sound Editor Demo!

From

Station Software

Welcome to Release 1.0 of WaveS Demo. WaveS Demo is a sound file editor for casual users and professionals. WaveS Demo is fast and easy to use with many advanced features. This is a demonstration release which is fully functional with the exception of file save capabilities.

Introducing WaveS Demo

WaveS Demo is an exploratory tool used to manipulate, analyze and play sound samples. This demonstration release is fully functional except that the File Save menu choice is disabled. See ordering information for a updated fully functional WaveS Editor plus credit towards future releases.

WaveS Demo Release 1.0 is a 8-bit monaural memory based sound file editor. Buffer size is only limited by the amount of memory in your system.

Program designers use this program for creating sound bites in Multimedia programs. Game designers use WaveS to create and edit game sounds. MultiMedia PC users create sounds for fun, for use in batch files and as informative signals or alarms. WaveS supports the Microsoft Windows 3.x .WAV format and will play sounds over any Microsoft Windows 3.x supported sound card. The sound device must have its driver installed to hear the sounds created with WaveS.

WaveS Demo features a fully functional Sound Editor with easy to use and intuitive DDEEdit. Multiple viewing options allow you to look at the waveform and decide which is the best way to translate audio information into visual information. Special effects (F/X) allows you to manipulate the sounds, creating useful and entertaining sound files.

A create waves option will make waveforms from scratch. These are useful for effects and for calibration and testing.

The mix menu choice will mix two sound buffers or will create some wild effects if multiply is chosen.

Play will play the selected area over any Windows 3.x compatible sound card. A looping feature is also available.

WaveS Window

The WaveS window shows the sound file selected in a visual format. Depending on the current View option the waveform is represented graphically with a X and Y axis. The markers are used to mark a section of the buffer that you wish to play, modify or zoom in on. The title bar of the window has the WaveS Demo name followed by the current file name.

Using WaveS is very easy. Position the markers to the part of the sound you wish to modify. Then select one of the menu commands. The sound inside the markers is then transformed, played or zoomed.

Hardware Requirements

WaveS Demo requires an IBM compatible 80286 PC or better. As all buffers are held in memory, 1 MB or more for large files is preferred. A math coprocessor will make most of the effects and specifically the Spectrum view tolerably quick. A sound card is not required to run the program. WaveS will use any Windows 3.x sound driver installed.

Menu Commands

Use this help section as you would the menu items when using WaveS.

File Menu Commands

The File commands read files from the disk into memory, save files from memory to disk, rename files, clears the buffer or quits the program. WaveS Demo has disabled the File Save and the Save as choices.

Open
Save
Save as
New
Exit

View Menu Commands

The View commands change the way the WaveS window presents the audio information in a visual format. The representation of sounds visually has different requirements based on the user's desires. All view choices present the waveform graphically with a X and Y axis. The options dialog will select whether more lines are drawn and the amount of averaging used in some of the views. You can zoom in on any portion of the waveform and then out to view the entire buffer. Move the markers to an area of interest then edit or transform the buffer. The marker position window indicates the precise time. If the window is in either CRF or CRF Plus mode, a CRF icon will appear in the lower right corner. As speed is important when drawing large buffers, the waveform view will show just the samples needed to fill the window. Finally the window colors are fully configurable to match the user's preferences.

Edit Menu Commands

The edit menu choices are similar to most text editor commands. What makes WaveS Demo unique is that instead of a hidden edit buffer, WaveS uses DDE to create another WaveS window and renames it to the "Cutting Room Floor" (CRF). This is a almost fully functional WaveS window where the edited scraps go and can then be reused or manipulated as desired. Only one CRF can exist under windows. Any number (limited by resources) of WaveS windows can exist. This unique feature of windows allows multiple waveforms to be viewed simultaneously and allows waveforms to be sent between windows.

In the WaveS window all editing actions occur on the buffer section between the start and end markers. Once the markers are positioned in the buffer as desired. The edit menu choice can be selected.

Copy To
Cut Out
Paste From
Delete Forever
Insert Silence
Cutting Room Floor
Cutting Room Floor Plus

F/X Menu Commands

F/X is Hollywood for special effects. Besides practical sound file modification as gain and equalization. WaveS offers some other interesting effects. Fade, Reverse and a very useful resampling effect which will make those files with dissimilar sample rates match up. The Equalize effect is a sophisticated Inverse Fast Fourier Transform giving you in effect a 512 band graphic equalizer.

Gain...
Fade...
ReSample...
Reverse
Equalize...
Mute

Mix Menu Commands

The mix menu commands will mix the selected buffer with the buffer in the CRF . Choose add to mix two sounds conventionally. Choose Multiply to produce special effects.

Add
Multiply

Play Menu Commands

The play menu choices will play the selected area of the buffer. These choices are available only if a sound driver is installed.

Buffer
Markers
Window
Loop

Create Menu Commands

The create waves menu choice allows creation of customized waveforms from scratch.

Waves

Help Menu Commands

These menu choices will select help topics to guide you through WaveS Demo or through using Windows help.

on WaveS
on Help
About WaveS Demo

Spectrum

The Spectrum View computes the Fast Fourier Transform (FFT) of the sound sample between the markers. The status window indicates the number of samples selected then indicates progress 1024 samples at a time. Once the spectrum is finished it displays a 512 sample frequency analysis. The markers then indicate the frequency if Marker Positions is selected. The spectrum's Y axis is linear and the level indicators are used as a reference only. The display represents the sum of the frequency components of all the 1024 sample windows in the buffer selected. The spectrum's view can be adjusted with the adjust option in the view options dialog. The spectrum can be stopped at any time by pressing the space bar.

.WAV File Format

The .WAV file format is the standard Microsoft Multimedia format for sound files. These files are Resource Interchange File Format (RIFF). A waveform file can contain 8 or 16 bit PCM (Pulse Code Modulation) samples. The file can be stereo or monaural. Release 1.0 of WaveS Demo will only handle monaural 8-bit files.

Windows 3.x Sound Driver

In order to play sounds with WaveS Demo a sound driver must be installed under windows. This is explained in the Windows User Manual. At the simplest the PC speaker sound driver is available from many BBSs or from Microsoft's Download BBS. Most sound cards (Creative Labs, MediaVision...) have drivers for Windows 3.x. With a good sound card your listening pleasure is greatly enhanced. If a driver is installed the View Info dialog shows the driver information.

Ordering WaveS

WaveS can only be ordered through the mail from:

Brian R. Gunnison
83 Roberts Rd.
Los Gatos, CA 95030

Enclose a check for $29.95, payable to Brian R. Gunnison.

California residents must add 8.5% sales tax.

Please indicate 3 1/4 or 5 1/2 inch floppy format and expect 2 to 4 weeks for delivery.

Ordering the fully functional WaveS Editor will guarantee you one free update to WaveS 1.0. and partial credit towards purchase of WaveS 2.0.

Use the order.txt file to speed up delivery and to send in your comments. Comments are also welcome via Email on:

Internet: brg@strata.com

GEnie: B.GUNNISON

Mix Multiply Menu Command

When multiply is chosen from the Mix menu the marked section of the buffer is multiplied with the marked section of the CRF buffer. The result is put back into the CRF. This is used primarily to create strange sound effects. If the buffer's sample rates do not match then a dialog will pop up asking you if you wish to continue. If there is no buffer in the CRF then no action will be taken. By necessity the resulting buffer's gain is reduced to prevent clipping. The CRF buffer size is not changed.

Mix Add Menu Command

When add is chosen from the Mix menu the marked section of the buffer is added with the marked section of the CRF buffer. The result is put back into the CRF. This is used to mix two tracks of sound into one track. If the buffer's sample rates do not match then a dialog will pop up asking you if you wish to continue. If there is no buffer in the CRF then the buffer is merely copied to the CRF. By necessity the resulting buffer's gain is reduced to prevent clipping. The CRF buffer size is not changed.

File Open Menu Command

The File Open menu choice will bring up a file dialog box with all files in the current directory with the .WAV extension. A file is selected by either double clicking on the filename or typing it in the file window. Click on OK and the file will be read and displayed in the WaveS window. If the current directory is changed the Open file dialog will remain in that directory.

File Save Menu Command

The File Save menu choice will save the entire buffer to the current directory. The file is saved to the directory and name as it appears in the WaveS window title bar. If saving the CRF buffer then the Save As dialog box appears and the file must be named there.

File Save As Menu Command

The File Save As menu choice will pop up the file save dialog and request a filename to save the buffer to. The drive and path can be specified in the filename box or click to get to the path and enter just the file name.

File New Menu Command

The File New command will flush the buffer and clear the WaveS window. If you have made any modifications WaveS asks if you want to save the buffer first.

File Exit Menu Command

The File Exit command quits WaveS and closes the WaveS window. If a CRF has been created it must be closed separately. If you have made any modifications WaveS asks if you want to save the buffer first.

View Info Menu Command

The View Info menu choice pops up a dialog box with information about the buffer and about the system. The buffer type is shown along with its revision. The buffer length is displayed and the sample rate. The Sample rate box has a Modify (M) pushbutton to the left of it. Use this if you desire to change the sample rate. Doing so will make the buffer sound fast or slow.

The next line is the sound driver name (if installed). Followed by that is the best sound file playing capability of this driver and sound card.

Next is the hard disk drive space left for the current drive, followed by the largest buffer memory space left. This is less than the total memory left as a buffer needs a continuous block of memory.

View Zoom Menu Command

The View Zoom command will zoom the current marker positions to show the area marked in the entire window. You can zoom indefinitely until all samples are displayed in the window. Use Entire Buffer to view the entire buffer again. The bottom scroll bar is only activated when the buffer is zoomed. Clicking on the arrows will advance the buffer by 1 pixel resolution. Clicking on the page scroll area will advance the buffer to the next window of the buffer. The scroll bar thumb represents where you are in the entire buffer.

View Entire Buffer Menu Command

The View Entire Buffer command will (if zoomed) zoom out to show the entire buffer in the window. This command can also be used to reset the markers to the start and the end of the entire buffer.

View Marker Positions Menu Command

The Marker position window indicates the position of the start and end markers. If any view other than Spectrum is selected the window indicates the time position of the markers. If the spectrum view is selected it indicates the frequency position. To turn on the window click on the menu choice. To turn it off do the same.

View Ave. Waveform Menu Command

View Ave. Waveform displays the buffer as an average of the samples giving a pleasing and easy to use display of the average level of the waveform. This method highlights the changes in gain allowing one to find locations between words or different sounds. Used with the display averaging option this view will show a smooth transition between sounds. This is the default view when starting WaveS.

View Waveform Menu Command

View Waveform displays the buffer unaltered. This method is the fastest way to view a large waveform. It also will show the actual volume allowing one to observe potential areas of clipping. This view does not use display averaging.

View Log Power Menu Command

This view shows the waveform as a average of the power in a Decibel scale. This view displays the changes of level best in order to detect the start and end of words or different sounds. Also it is used to observe the effect of level changes as these are in dB also.

View Options Menu Command

The View Options dialog has multiple choices that decide how you want to change the waveform display.

The display smoothing box has 5 choices ranging from 1 to 16. The larger the number the smoother the waveform will be drawn. This effects only the average, log power and spectrum views. Use this if the waveform is too rough to see the desired area.

The next three buttons will draw labels and axis lines to allow you to display the waveform as if it were drawn on graph paper. Click on **Show Text** to display the axis level numbers and the view type. **Show Time Lines** will draw time lines in the Y axis along with the time under the Y axis. **Show Level Lines** draws level lines in the X axis. All of these choices modify the WaveS.ini file in your windows directory and will be in effect the next time you start up WaveS Demo.

The FFT Display Scale and FFT Display Vert. Pos scroll bars and one button are only used for the spectrum view. See spectrum display adjust for more information.

View Customize Menu Command

The customize dialog allows you to change the colors of the WaveS window. The three scrollbars are colored Red, Green and Blue. Select the screen attribute you wish to change and then mix the appropriate amount of primary colors to get the effect desired. The background, waveform, axis, text and marker colors can be changed. The changes are saved in the WaveS.ini file. Be careful to not choose the same color for two items as one may not be visible when the window is displayed.

Edit Copy To Menu Command

The Edit Copy To command will copy the marked area of the buffer and send it to the CRF. The buffer is unchanged.

Edit Cut Out Menu Command

The Edit Cut Out command will delete the portion of the buffer between the markers and send it to the CRF. The new buffer is redrawn and if zoomed the entire buffer is shown.

Edit Paste From Menu Command

The Edit Paste From command will insert the marked CRF buffer at the location of the WaveS window start marker. The buffer is now larger and is redrawn. If zoomed the entire buffer is displayed. Use the markers in the CRF window to find areas of interest and then use the start marker in the WaveS window to insert the CRF area.

Edit Delete Forever Menu Command

The Edit Delete Forever command will delete the area between the markers forever. You will be prompted if you wish to continue. The window is redrawn and the buffer is now smaller. If zoomed the entire buffer is shown.

Edit Insert Silence Menu Command

The Edit insert Silence command will insert silence starting at the start marker and will insert the amount of silence shown between the start and end markers. If you wish to insert 0.5 seconds of silence then position the start marker at the location for insertion. Position the end marker 0.5 seconds from the start marker and choose the command.

Edit Cutting Room Floor (Plus) Menu Command

Choosing this command will cause the WaveS window to convert to the Cutting Room Floor (CRF). This is another special instance of the WaveS window that is mostly used as a edit buffer to hold edited scraps of sound from other WaveS windows. The CRF is identified by the CRF icon in the lower right corner and by its title. Only one CRF can exist at a time. If a CRF is created by a WaveS window it can be turned into a WaveS window by deselecting this menu choice. CRF and CRF Plus are mutually exclusive. The CRF will erase its buffer if a WaveS window sends it another scrap. The CRF Plus will append to its current buffer any scraps sent to it. This is the only difference between the two. The CRF Plus Icon has a blue "+" sign on it.

The CRF can manipulate sounds just like the normal WaveS window with the exception of commands that would use another CRF. These are as follows:

Edit Copy To
Edit Cut To
Edit Copy To
Edit Paste From
Mix Add
Mix Multiply

The CRF receives its buffers via DDE (Dynamic Data Exchange). It also can send its buffer to a WaveS window that requests it via the Edit Paste From command. Buffers that are appended or inserted into other buffers are checked to see if their sample rates match. If not, then you are asked if you wish to continue. It is recommended to use the FX ReSample command to change the buffer to match.

FX Gain Menu Command

The FX Gain dialog has a gain scroll bar that can adjust the gain of the marked area up or down by 6 dB . If the gain is adjusted up and clipping occurs then the per cent of the buffer clipped is shown. The Fade buttons have no effect.

FX Fade Menu Command

The FX Fade dialog has a gain scroll bar that specifies the ending gain of the fade. If the Fade In button is selected the marked area of the buffer is faded from silence to the level selected. If the Fade Out button is selected then the marked area of the buffer is faded to the level selected. If the end level selected is greater than 0 dB then clipping can occur. The per cent of the buffer clipped will be shown.

FX ReSample Menu Command

The FX ReSample command effects the entire buffer. It changes the sample rate without effecting the way the buffer sounds. Changing the sample rate up causes the buffer to grow in size. Changing down the buffer is then smaller. Resampling is most useful for combining buffers with different sample rates. There are tradeoffs in changing the sample rate for sound quality. The higher the sample rate the more high frequency sounds are available. Resampling a buffer down will lose the higher frequencies. Resampling a buffer up will not regain these frequencies and will introduce low level noise (hiss).

FX Reverse Menu Command

FX Reverse turns the buffer around backwards. If you want to hear if that heavy-metal riff really says what the school board thinks then try this. This effects only the marked section of the buffer. You can ReReverse to return the buffer to normal.

FX Mute Menu Command

Mute silences the area bounded by the markers. It is useful for eliminating noise between words and for damping clicks and pops. This effect cannot be reversed.

FX Equalize Menu Command

The FX Equalize command allows you to change the frequency response of the buffer. Think of it as a advanced graphic equalizer. The equalize dialog has a start and stop frequency which are changeable via the Modify (M) button. This is the frequency range that you can change the level of via the start and end gain scrollbars. The start gain is the gain applied to the start frequency. The Gain is ramped linearly to the end gain at the end frequency. The following are some examples on how this can work.

A lowpass filter can be applied to the buffer by changing the start frequency to where the undesired frequencies start (actually a bit before). The end frequency can only go as far as one half the sample rate. The End gain can be set to how much attenuation you wish at the highest frequency. If your buffer has a sample rate of 44100 samples per second and you wish to lower the high frequencies above 10000 Hz then set the start frequency at 9000, the end at 22050 Hz and the end gain at -20 dB.

A highpass filter can be created by changing the end frequency to where the desired frequencies start. Leave the start frequency at 0. The start gain is set to how much attenuation is desired at the lowest frequency. If your buffer has a sample rate of 8000 and you wish to attenuate the low frequencies below 1000 Hz then set the end frequency at 1000 and the start gain at -20 dB.

A band reject filter is easily made by changing the start frequency to where the undesired frequencies start and the end frequency to where the undesired frequencies end. Set both the start and end gains to the desired attenuation. If you want to get rid of some annoying whining noise in your speech file use the spectrum view to find the highest peak in the high frequency range. Set the start and end markers at the beginning and end of the peak and the attenuation at -40 dB or more.

A limited bandpass filter is possible by doing a band reject and instead of negative dBs make the gain positive. Clipping can occur and you will be informed.

This method is best learned by experimenting on small buffers. Use the spectrum view to observe your changes. When the equalization is finished the ideal frequency response is shown. To see the actual frequency response requires that you change from the spectrum view and then redo the spectrum view again. Also watch out for radical changes in gain. These will introduce undesired noise. If radical changes are required then do it in several steps.

The Equalize calculations can be stopped at any time by pressing the spacebar.

Play Buffer Menu Command

The Play Buffer command will play the entire buffer. WaveS will be dedicated to playing until the buffer ends.

Play Markers Menu Command

The Play Markers command will play only the area between the markers. WaveS will be dedicating to playing until the area is finished.

Play Window Menu Command

Play Window will play the buffer displayed in the window. This is only different than the play buffer command if you are zoomed. WaveS is dedicated to playing until the window is finished.

Play Loop Menu Command

The Looping command sets the loop option for playing buffers. If set the buffer will play over and over. This can only be stopped by pressing the spacebar. Click again on the menu choice to turn looping off.

Create Waves Menu Command

The create waves dialog allows you to create waveforms. The selections include sine, square, triangle and noise waveforms. The buffer size, sample rate and frequency can be set by clicking on the Modify (M) buttons. You must enter something in each of these fields to create a wave. The waveform volume is varied by the gain scrollbar. As the sine and noise waveforms require large amounts of calculations, if you need to create large buffers try just creating a small one and copying it to the CRF. Change the CRF to CRF Plus and continually copy it until the desired buffer size is reached.

Help on WaveS Menu Command

This command brings up the help file you are reading now.

Help on Help Menu Command

This command brings up a help file that helps you use Microsoft's help files.

Help About Menu Command

This displays a dialog with information about WaveS.

Markers

The markers are thick vertical lines with end pointers. The markers contain the buffer area that you wish to modify. The start marker is initially just at the Y axis line. The end marker is at the far right end of the WaveS window. The markers can only be moved by a mouse. Double clicking the mouse anywhere in the WaveS window will move the closest marker to that position. If you double click between the markers be sure to be closer to the one you want to move. For fine positioning move the cursor over a marker and see it change to the start or end cursor. The start cursor is a left and right pointing arrow with a large "S" in the middle. The end cursor has instead a large "E". By holding down the left mouse button the marker turns into a dashed line and will follow the cursor. Let up on the mouse button and the marker is put down at that position. The markers are also different colors depending on your current background color. Use the View Customize dialog to change the marker colors for a good contrast. If the window is vertically very small the marker pointers are no longer used and they become just vertical lines. The cursors are reset to the beginning and end of the window for many menu commands. Use the Marker Positions window to remember where they were.

Notices

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Modify

The "M" pushbutton calls up a number entry dialog box. Each digit can be changed with its corresponding scroll bar. Click the up arrow to increase the digit and the down arrow to decrease. The "Zero Entry" button will clear the number entered. When you are finished click the "OK" button and your number will appear in the dialog window.

Display Averaging

The View Options Display averaging smooths the waveform display allowing you to see the general trend in amplitude or frequency. Use this option if the waveform is too noisy or if a more pleasing display is desired. This setting is kept in the WaveS.ini file and will be in effect the next time you use WaveS.

WaveS.ini

The WaveS.ini file contains initialization numbers that control how the WaveS window appears. This file is written to your windows directory when you first invoke WaveS. It is not recommended modifying this file as its contents can be changed via the View Options dialog or the View Customize dialog. You do not need this file to use WaveS. If it is erased WaveS will recreate it with defaults.

Spectrum View Adjust

The View Options dialog contains adjustments that apply to the spectrum view. If the spectrum is too small the FFT Display Scale scrollbar can be increased which will multiply the gain by 10. The FFT Display Vert. Pos. scroll bar in conjunction with the "Exponent" button will adjust the display down allowing you to see the peaks of the spectrum. These values are only effective for the current spectrum view and are not saved in the WaveS.ini file.

Decibels

Decibels are a logarithmic scale and are used to measure sound level. Your ears actually hear in decibels as it takes ten times the sound level to sound twice as loud. Decibels are abbreviated dB. A 3 dB volume change causes a 50% change in level.

Decibels

Clipping occurs when the sound is louder than the sample number range. 8 bit sound files range from -128 to +128. If you try to change the gain on a sound file by too much some of the samples will exceed thier bounds and these are counted as clipped. This produces distortion and is irreversible. The warning dialog for the gain and other effects will tell you what per cent of the buffer has been clipped. If this number is too large (greater than 1 or 2%) try reducing the volume. As clipping cannot be undone be sure to save your work often and reload the buffer before trying again.

Future Releases

WaveS release 2.0 is significantly improved over Release 1.0. The following are just the important differences.

16-bit file support for CD quality sound.

Stereo file support, view and effects.

3D Frequency display

More effects: Frequency translation, echo, crossfade...

Text markers allow you to put notes and bookmarks in the sound buffer

So please send in your comments and then you can see your features in WaveS release 2.0!