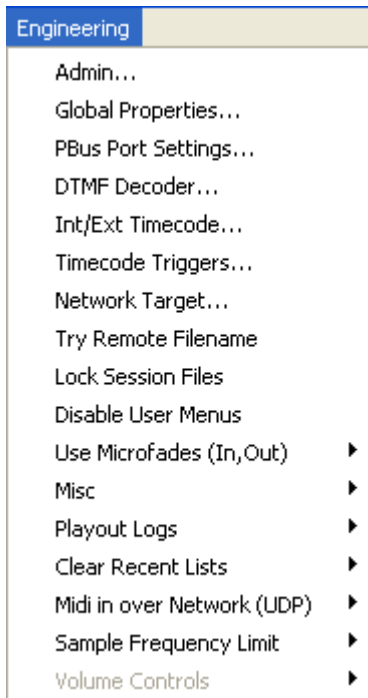


# Engineering Menu



The Engineering Menu contains options to be set by an advanced user

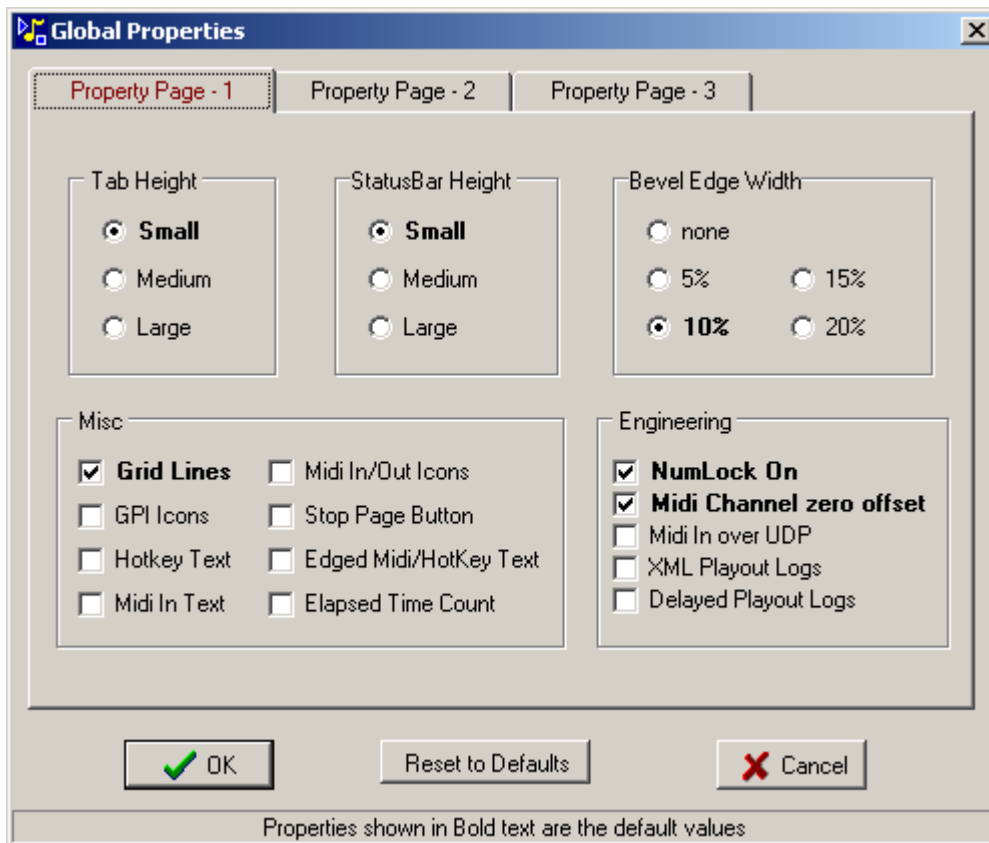
<a href="#">Admin</a>	Administrator menu options
<a href="#">Global Properties</a>	Set range of property values
<a href="#">PBus Port Settings</a>	Settings for receiving PBus commands
<a href="#">DTMF Decoder</a>	Settings for receiving external DTMF tones
<a href="#">Int/Ext Timecode</a>	Input settings for SMPTE or Button timecode
<a href="#">Timecode Triggers</a>	Trigger buttons from a list of SMPTE timecodes
<a href="#">Network Target</a>	Assigns target computer address
<a href="#">Try Remote Filename</a>	search remote locations for audio file
<a href="#">Lock Session Files</a>	Set loaded track files to be read-only
<a href="#">Disable User Menus</a>	Disable menu items for simple playout operation
<a href="#">Use Micro Fades</a>	Render precision fades for Fade Out and short Fade In durations
<a href="#">Misc</a>	Assorted Settings
<a href="#">Playout Logs</a>	Options for generating/copying playout logs
<a href="#">Clear Recent Lists</a>	Clear history lists in File menu
<a href="#">Midi In over Network</a>	Enables Midi messages received via a Network connection
<a href="#">Sample Frequency Limit</a>	Set highest sample frequency that SpotOn will allow in WAV files
<a href="#">Volume Controls</a>	Adjust levels of Windows volume controls for each output - option disabled

## Admin

Provides password protected access to the [Administrator](#) menu options

## Global Properties

The Global Properties option allows a large number of the menu options to be viewed and set within one dialog window.

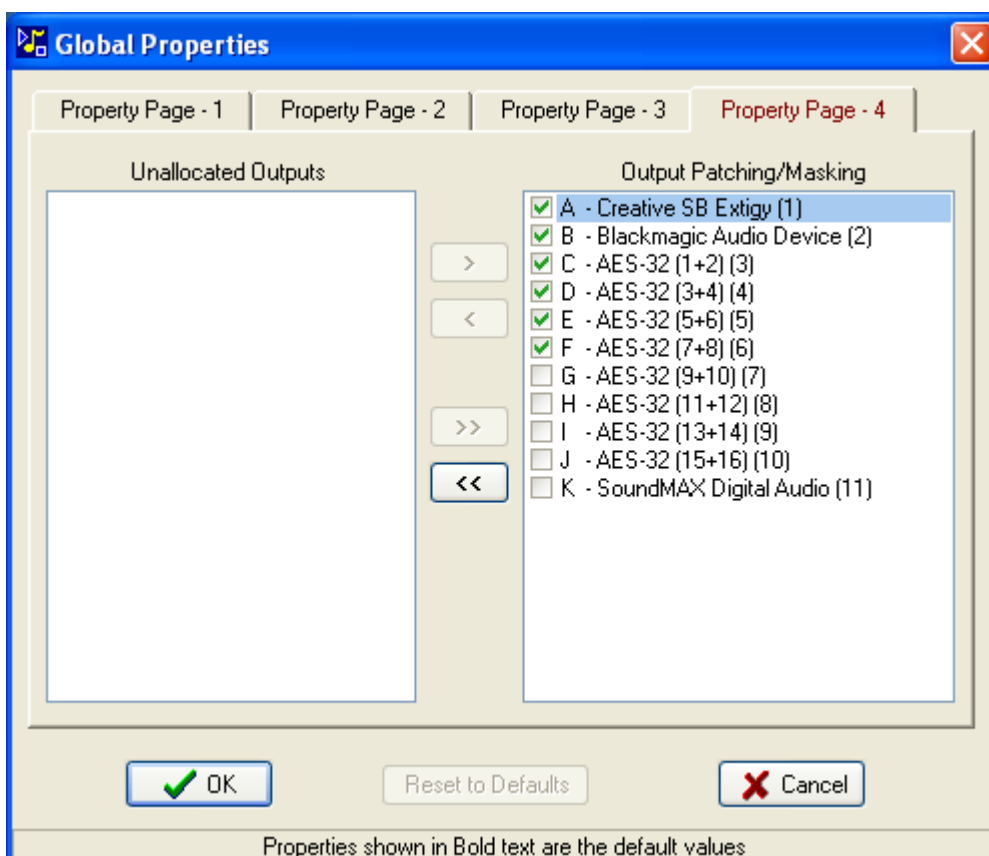


The default values are shown in bold text

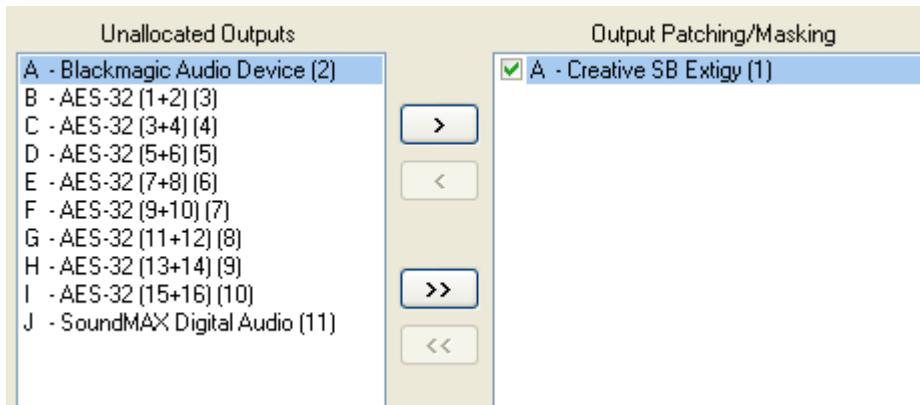
The 'Reset to Defaults' button will set all properties on all pages to the default values.

The 4th property page is only accessible when Admin mode is enabled, this page is a slightly more sophisticated version of the [Output Assignment](#) dialog.

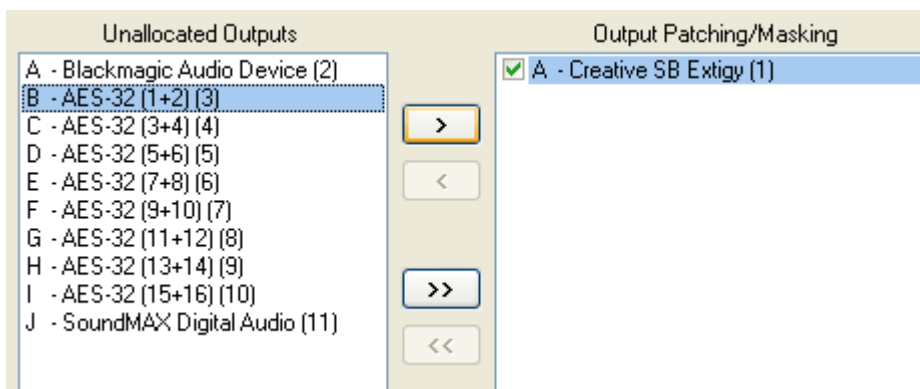
Initially the current output device configuration is shown in the right hand panel



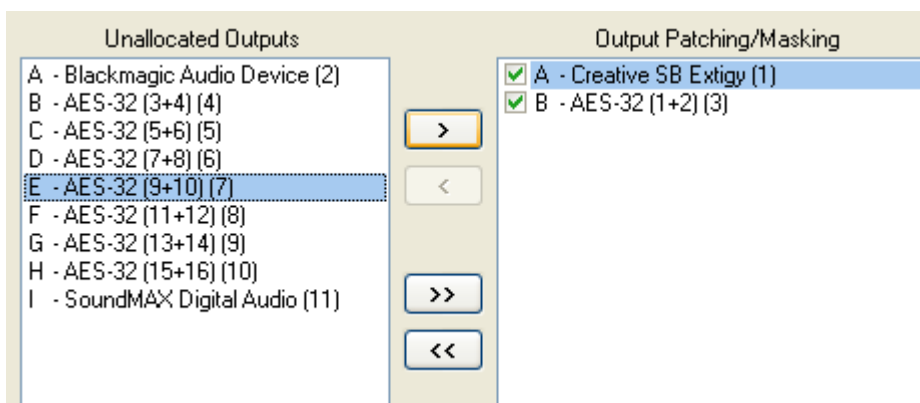
Clicking the << button will move all except the default output device into the left panel.



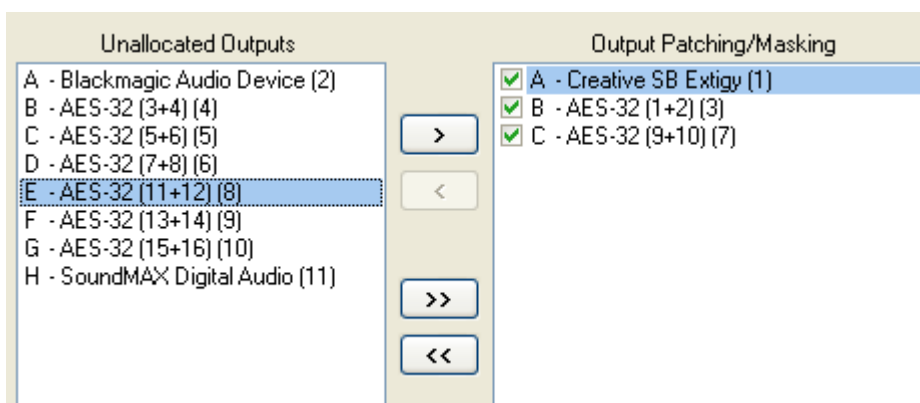
Now the output order can be built up by highlighting a entry in the left panel and clicking > to move the output in to the right hand panel.



The moved entry will be automatically 'unmasked' (checkbox ticked)

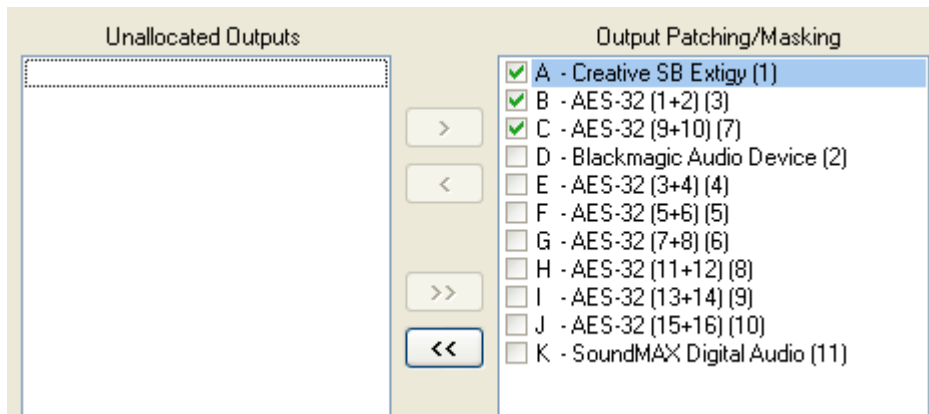


Continue moving entries until all the required outputs are in the right hand panel



Finally move all the remaining entries across to the right hand panel by clicking >>

These items will be entered as masked.



The order of the items in the right hand panel can be changed by left drag/dropping.

### **Try Remote Filename**

When loading a session file it is possible that some audio material referred to has been deleted from the local drive, in this case if the track assigned to a particular button cannot be found the button remains blank and a warning dialog will display the tracks not found.

However, if the Try Remote Filename option is checked then the original file location will also be tested to see if the file is still in that location, if it is it will be copied to the local drive. The disadvantage of this is that if network drives are being used and are offline, the timeout can be quite long making the program unresponsive.

### **PBus Settings**

SetUp for PBus control see [PBus Control](#)

**PBus SetUp**

**Port Number**

☒ None
 ☐ Com 1
 ☐ Com 2
 ☐ Com 3
 ☐ Com 4
 ☐ Com 5
 ☐ Com 6
 ☐ Com 7
 ☐ Com 8
 ☐ Com 9
 ☐ Com 10
 ☐ Com 11
 ☐ Com 12
 ☐ Com 13
 ☐ Com 14
 ☐ Com 15
 ☐ Com 16

**Baud Rate**

☐ 9600
 ☐ 19200
 ☒ 38400

**Stop Bits**

☒ 1
 ☐ 2

**Parity**

☒ None
 ☐ Odd
 ☐ Even

Defaults

**Address Range 10..11 - Buttons 1..200**

Base Address  Number of Addresses

Registers 0..99 at Addr 10 refer to Btns 1..100  
 Registers 0..99 at Addr 11 refer to Btns 101..200  
 Registers 0..99 at Addr 12 refer to Btns 201..300  
 Registers 0..31 at Addr 13 refer to Btns 301..320

OK Cancel

## Int/Ext Timecode

SpotOn can decode external SMPTE longitudinal timecode from a selected audio input or take the elapsed time timecode of a nominated button and use it to trigger [GPis](#) or cause [AutoPlay](#) buttons to chase the timecode.

**Timecode Input**

Options Chase Timecode

**Timecode Input Source (30Hz)**

☒ Left Channel
 ☐ Right Channel
 ☐ L-R Difference

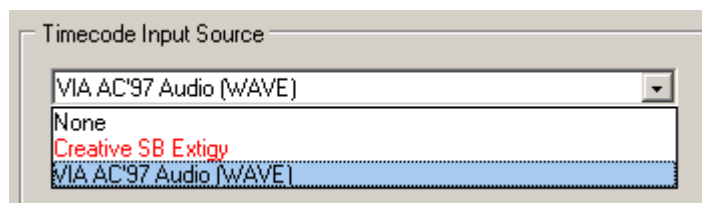
☐ +18dB
 ☐ +12dB
 ☐ +6dB
 ☒ Unity
 ☐ -6dB

LTC Level  
 +6dB  
 0dB  
 -6dB  
 -18dBFS  
 10:00:09.03

Calculate Timecode from track position of Button number

OK Cancel

The analogue audio timecode (LTC) should be connected to an audio input channel and the channel selected from the upper drop-down menu.



The lower drop-down menu selects the sample rate and bit depth for the timecode signal - this is fixed at 44.1kHz and 16 bit.



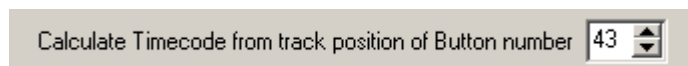
The bargraphs on the right hand side of the window show the signal levels for left and right channels, immediately below is the calculated average signal level and the decoded timecode value.

The timecode can be decoded from the Left or Right channels or the difference between the two channels, the last option is a facility to use a balanced feed of LTC with an unbalanced stereo input as might be found on a Laptop computer.

Coarse and fine gain adjustment are available to compensate for low level inputs, if possible the level should be set to match the markers (-18dBFS) on the level bars .

The default options are shown in bold text.

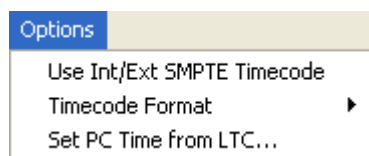
To use the alternative of deriving the timecode from a button select a non zero value in the button number box



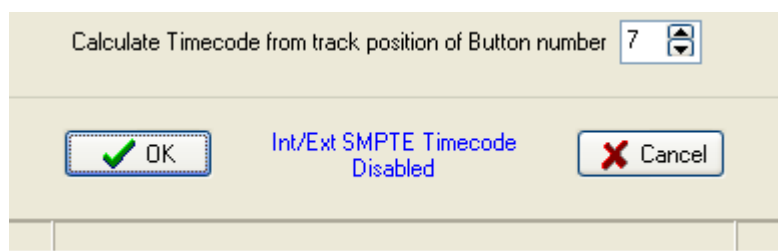
The action of selecting a non-zero button number will set the audio input to None, similarly setting the audio input selection to anything other than None will set the button number to zero.

The timecode is calculated from the current absolute position within the track and does not take into account any In Point that may be set.

If the button number is set to 321 (which exceeds the highest button number available) the timecode will be based on the PC internal clock.



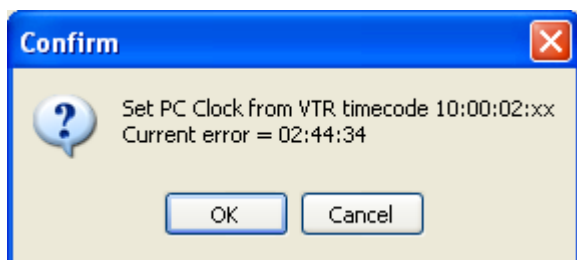
The Use Int/Ext SMPTE Timecode item duplicates the item in the [Options menu](#) and can disable/enable all the timecode facilities, if disabled a message will be shown in the lower part of the dialog.



Timecode format to be changed from the default of 25Hz non-drop frame.

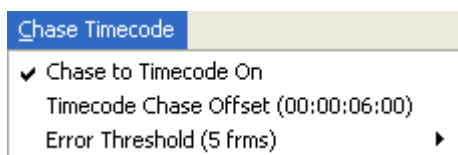


Additionally the external LTC signal can be used to set the PC clock, a prompt dialog box is shown with the current error



Access rights of the current user may restrict the ability to change the PC clock settings.

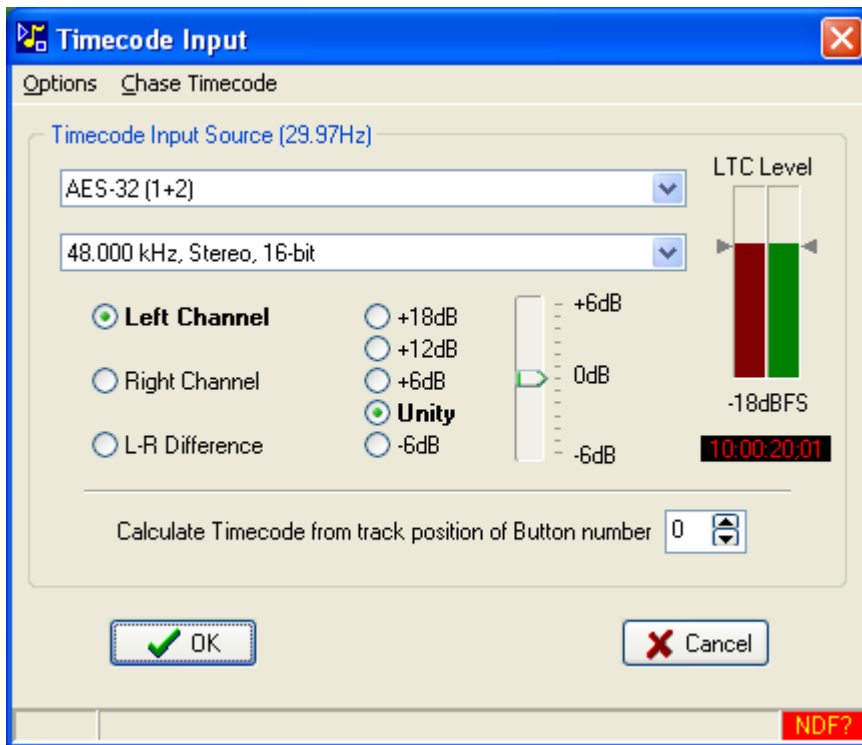
The timecode chase function allows [AutoPlay](#) buttons to chase external timecode, this function is enabled by checking 'Chase to Timecode On', alternatively this option can be set via a command line switch /[ChaseTCode](#).



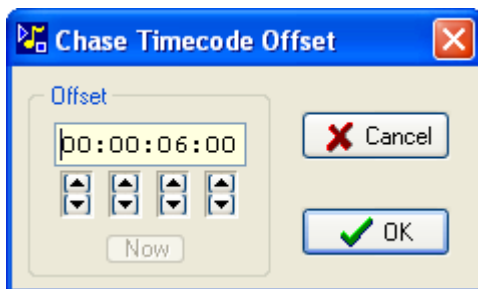
The buttons selected to chase timecode should preferably be BWA V files containing an embedded start timecode in the metadata. The start time on Non BWA V buttons or BWA V buttons with no embedded start time will default to a 00:00:00:00.

It is important that the global [Timecode Format](#) set above matches the external timecode being used, differences in frame rate are not flagged but if there is a discrepancy between drop frame and non-drop frame timecode is will be indicated in the right hand side of the status bar.

In the example below the global Timecode Format is set to 30Hz drop frame (29.97Hz), however the external timecode has been detected as non-drop frame.



The dialog below enables an offset to be entered so that the button timecode is always a predetermined amount ahead of the external timecode.



The Error Threshold setting defines how much error there has to be between the external timecode and the button timecode before the button is resynchronised.

- +/- 1 frame**
- +/- 2 frames
- +/- 3 frames
- +/- 4 frames
- ✓ +/- 5 frames

## Timecode Triggers

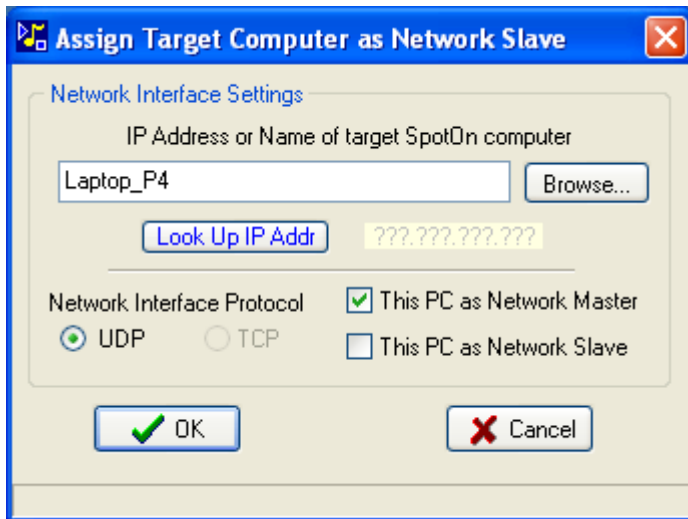
The [Timecode Trigger List](#) offers a method of triggering buttons from incoming timecode as an alternative to emulated GPIs

## DTMF Tone Trigger

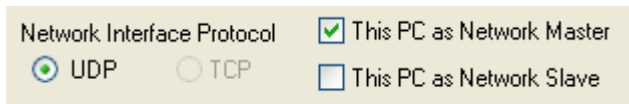
SpotOn can decode [DTMF](#) tone sequences and trigger buttons via associated Midi notes 16/100..115



## Network Target



If a Target follow Master setup is required where two SpotOn computers have identical packages loaded and one computer is to track the other then 'This PC as Network Master' should be checked on the Master computer and 'This PC as Network Slave' checked on the Target computer.

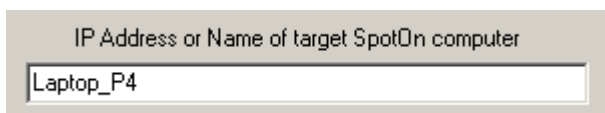


When loading packages onto other computers, the computer name and dongle number are automatically checked against those embedded in the package file to ensure the Networked messages are not looped back to the same computer.

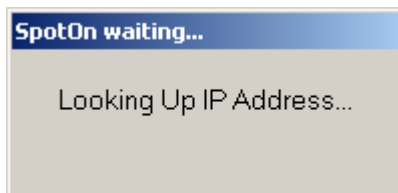
On the status bar of the Master computer the MidiOut panel should have underlined text indicating it is a Network Master

Midi Out On

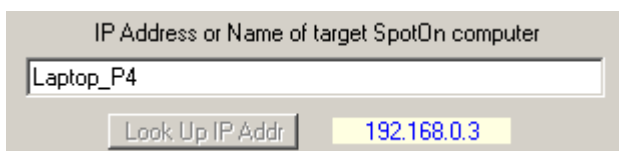
On the Master computer enter the computer name or IP address for the Target computer.



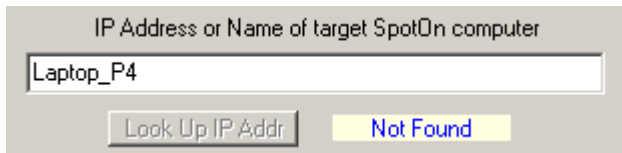
If only the computer name of the target computer is known, the current IP address of that computer can be found by clicking on LookUp IP Addr.



if the look up is successful then the IP address will be displayed proving that the computer is or was recently connected to the network



if the look up fails then Not Found is shown indicating that no computer of that name is currently on the network



SpotOn will accept either the Target computer name or its IP address, entering the computer name is preferred on networks operating DHCP where the computer IP addresses are not fixed.

Other than loading the packages the following should be set automatically on exiting the dialog

On the Master computer "[Use Midi Out](#)" in the Options menu must be enabled.

On the target computer "[Use Midi In over Network|Midi In over UDP](#)" in the Engineering menu and "[Use Midi In](#)" in the Options menu must be enabled.

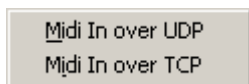
#### Master Computer

Network Master - checked  
Enter name of Target Computer  
Use Midi Out - enabled  
Load package

#### Target Computer

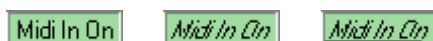
Network Master - unchecked  
Use Midi In over Network (UDP) - checked  
Use Midi In - enabled  
Load same package as Master

### **Midi In over Network**



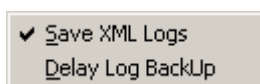
SpotOn can accept conventional Midi messages supplied via the sound card or game port, it can also respond to Midi messages passed to the computer running SpotOn via a network connection and is enabled by checking the UDP and/or TCP options.

The Midi In On mimic on the main window status bar will be in italics if either option is checked.



See [UDP/TCP Commands](#) for further information and details of non-Midi commands that can be sent over UDP

### **Playout Logs**

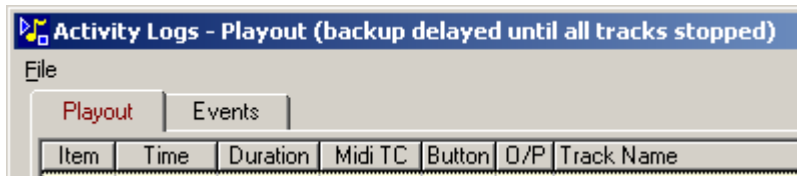


#### [Save XML Logs](#)

Delay Log BackUp

Generate XML formatted playout logs as well as plain text logs  
Delays backup of Playout logs until all tracks are stopped, this

When Delayed Log BackUp is selected the Playout log display window title bar indicates the selection.



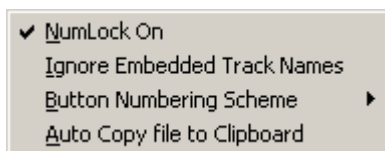
## Lock Session Files

To avoid accidental deletion or modification of files loaded into a session they can be set to be Read-Only for the duration of the session by using this option which is saved within the session and package files.

## Disable User Menus

If the SpotOn is to be used purely for playout and no loading or editing facilities are required then this option will disable all the main menus and the right click options.

## Misc



NumLock On

[Ignore Embedded Track Names](#)

[Button Numbering Scheme](#)

Auto Copy file to Clipboard

Set NumLock on at start up

Ignore embedded track names when loading audio files

Arrange the numbering of tracks

When checked the [button popup menu](#) Copy action will also copy

## Misc - NumLock On

When checked set the keyboard NumLock state to be On at start up

## Misc - Ignore Embedded Track Names

Audio files can have a 'Display name' embedded in the file along with the audio data, by default SpotOn uses this name if it is present as the Trackname when loading the file.

When this option is checked SpotOn will ignore the embedded 'Display Title' and make up a Trackname from the filename of the audio track when the file is initially loaded

## Misc - Button Numbering Scheme

### ✓ **Normal**

Paged in Rows

Paged in Columns

Paged in Rows/Columns

Paged in Columns/Rows

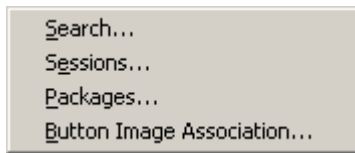
Paged in 2 Blocks per page

Normal with Column/Row order

In some instances the default numbering of the buttons on the pages may not be suitable so a range of alternative schemes is available:-

Normal	1	2	3	4	5	6
(numbers increase on subsequent pages)	7	8	9	10	11	12
	13	14	15	16	17	18
	19	20	21	22	23	24
Paged in Rows	1	2	3	4	5	6
(numbers the same on all pages)	1	2	3	4	5	6
	1	2	3	4	5	6
	1	2	3	4	5	6
Paged in Columns	1	1	1	1	1	1
(numbers the same on all pages)	2	2	2	2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
Paged in Rows/Columns	1	2	3	4	5	6
(numbers the same on all pages)	7	8	9	10	11	12
	13	14	15	16	17	18
	19	20	21	22	23	24
Paged in Columns/Rows	1	5	9	13	17	21
(numbers the same on all pages)	2	6	10	14	18	22
	3	7	11	15	19	23
	4	8	12	16	20	24
Paged in 2 Blocks per page	1	5	9	1	5	9
(numbers the same on all pages)	2	6	10	2	6	10
	3	7	11	3	7	11
	4	8	12	4	8	12
Normal but with Column/Row order	1	5	9	13	17	21
(numbers increase on subsequent pages)	2	6	10	14	18	22
	3	7	11	15	19	23
	4	8	12	16	20	24

## Clear Recent Lists



Recent history lists available from the File menu and the File Search history can be cleared with this option along with the button image associations, note Undo does not operate with these actions.

## Sample Frequency Limit

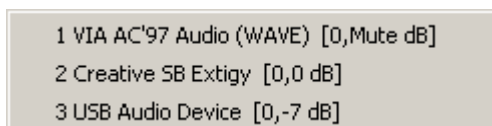


The sample frequency of WAV files can be any value - typically 8,000.. 96,000 samples/second, at the higher sample frequencies and especially with 32 bit samples the data rate can become very high and the application will slow down as more CPU time is absorbed during payout.

The default value is 48kHz which should be sufficient for most purposes.

## Volume Controls - menu item disabled

Each audio output device on a PC has its own set of mixer controls these can be accessed with this menu option

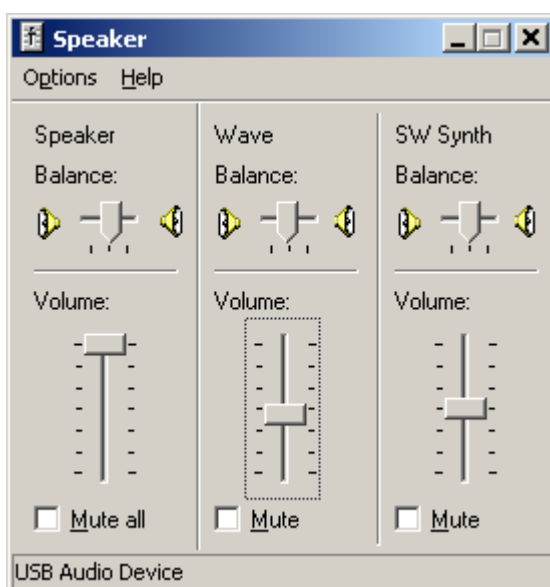
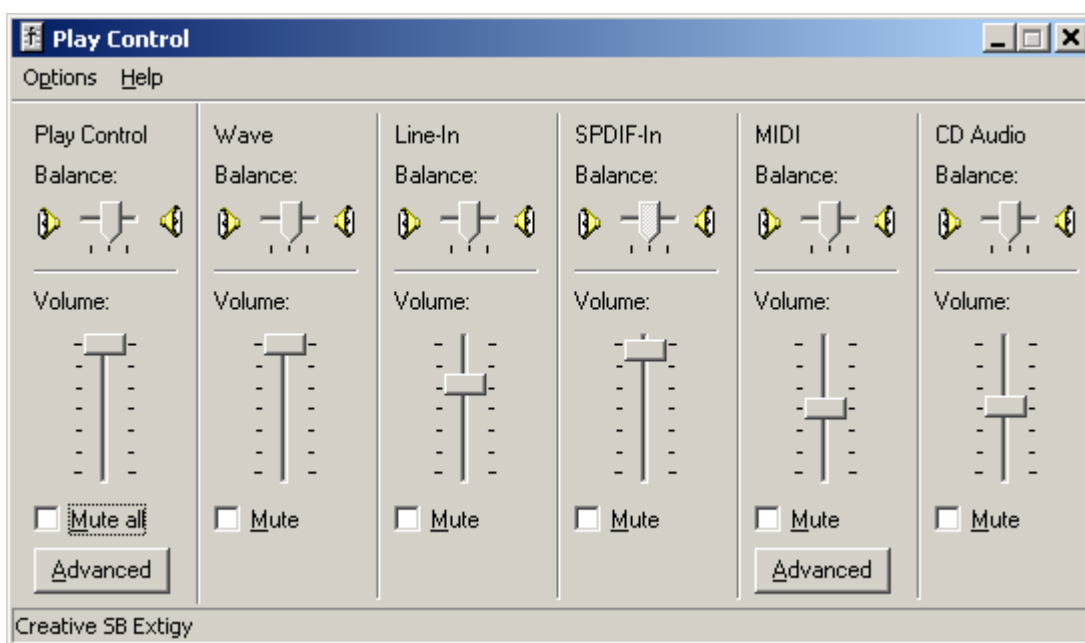
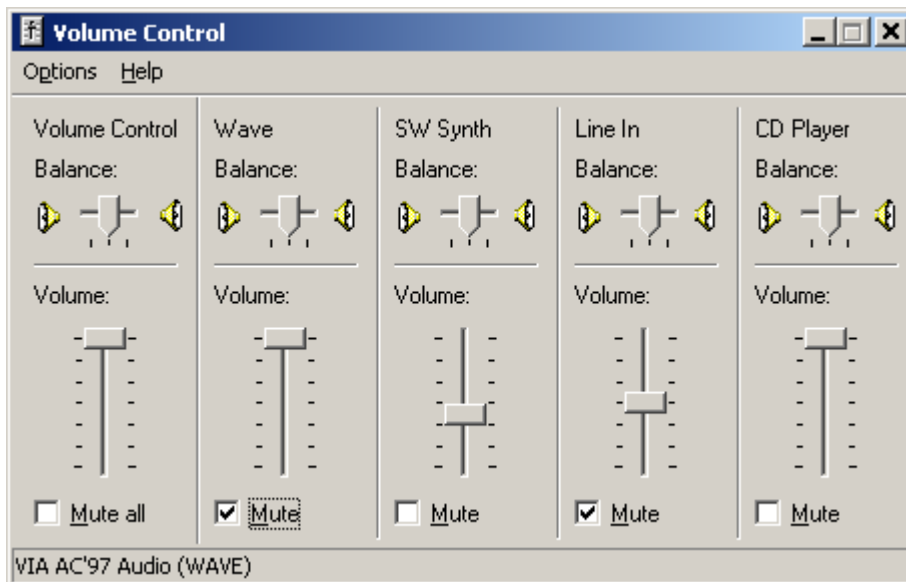


Note the level settings displayed to the right of the sound device name, these are of the form:-

[ Master level, Wave output level ]

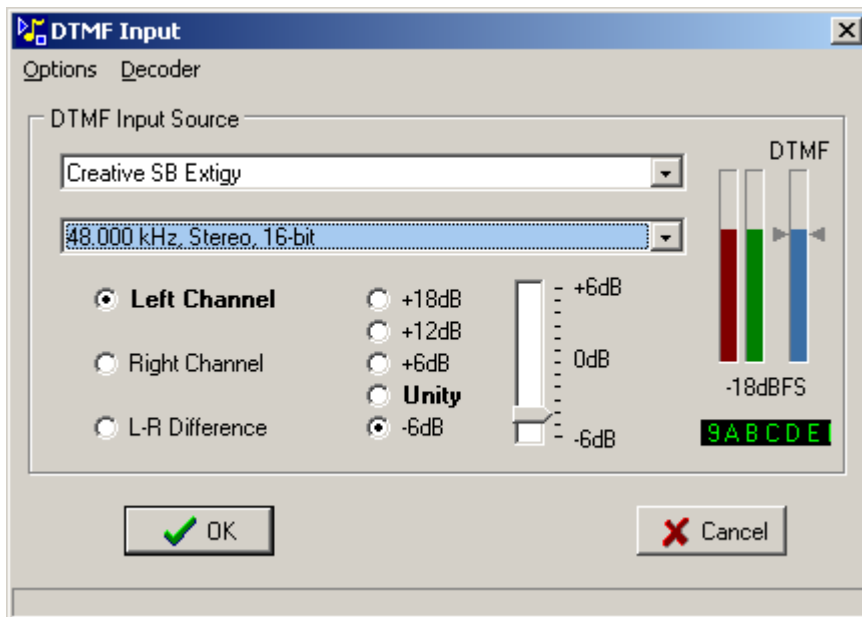
Levels are shown in dB (0dB is the maximum level), if a level is muted the word "Mute" is shown instead of the level value.

Typical control panels are shown below - note that not all sound card drivers support all options.

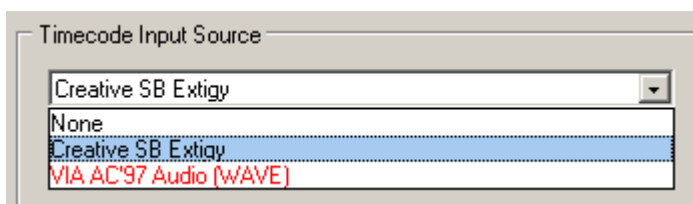


# DTMF Decoder

SpotOn can decode external DTMF tones (0..F) from a selected audio input and use them to trigger buttons via Midi notes 100..115 on channel 16.



The analogue DTMF source should be connected to an audio input channel and the channel selected from the upper drop-down menu. If the source entry is displayed in red text then it is already in use as an input for the [SMPTE timecode](#) reader and is not available.



The lower drop-down menu selects the sample rate and bit depth for the timecode signal - this is fixed at 48kHz and 16 bit.



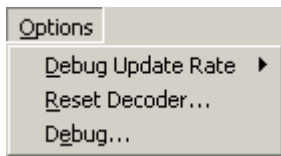
The bargraphs on the right hand side of the window show the signal levels for left, right and filtered channels, immediately below is the decoded data scrolling right to left.

Coarse and fine gain adjustment are available to compensate for low level inputs, if possible the level should be set so that the right hand bargraph matches the markers (-18dBFS).

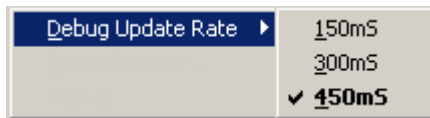
The DTMF can be decoded from the Left channel, Right channel or the difference between the two channels, the last option is a facility to use a balanced feed of DTMF with an unbalanced stereo input as might be found on a Laptop computer.

The default options are shown in bold text.

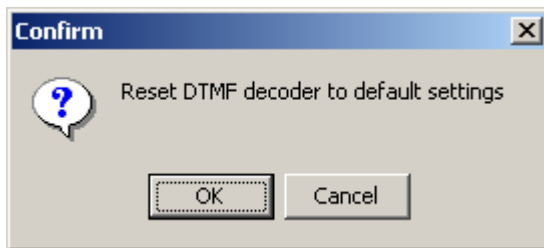
The DTMF tones decoded are translated to Midi Note On messages in the range 100..115 on channel 16 for DTMF tones 0..F respectively where E=\* and F=#.



Debug Update rate sets the refresh period of the debug display



Reset Decoder sets all the decoder parameters to their default values after clicking on OK in the confirmation dialog



The Debug option displays a live timestamped list of the incoming DTMF data along with analysis of the signal quality



	0	1	2	3	4	5	6	7	Error	Twist	Tone3	Rat
	697Hz	770Hz	852Hz	941Hz	1209Hz	1336Hz	1477Hz	1633Hz		dB	dB	%
0000mS >	92,	176,	2304,	123,	1040,	25,	46,	25	tone3	-6.9	-15.4	8
0025mS >	28,	39,	4,	7,	7,	25,	3,	5	bntot	2.9	-1.0	5
0050mS >	42,	12,	15,	18,	4,	30,	7,	8	bntot	-2.9	-4.6	5
0075mS >	32,	26,	47,	383,	12,	311,	10,	6	tone3	-1.8	-16.4	8
0100mS >	49,	144,	101,	2138,	37,	2326,	26,	6 = 0		0.7	-23.5	9
0125mS >	42,	223,	95,	1454,	46,	2169,	26,	9	tone3	3.5	-16.3	8
0150mS >	46,	178,	16,	36,	9,	134,	7,	4	bntot	-2.5	-9.3	7
0175mS >	32,	117,	18,	7,	6,	14,	9,	2	bntot	11.2	-5.3	7
0200mS >	47,	39,	9,	4,	14,	40,	12,	4	bntot	-1.3	-0.4	5
0225mS >	696,	100,	17,	19,	434,	78,	15,	13	tone3	-4.1	-12.8	8
0250mS >	2634,	123,	17,	16,	1708,	70,	14,	13 = 1		-3.8	-22.9	9
0275mS >	1246,	104,	11,	8,	1181,	43,	11,	9 = 1 ****		-0.5	-21.1	9
0300mS >	18,	38,	10,	2,	59,	15,	5,	4	bntot	3.8	-6.6	6
0325mS >	13,	63,	16,	6,	2,	9,	4,	1	bntot	-11.9	-1.7	6
0350mS >	35,	53,	8,	2,	4,	15,	7,	3	bntot	3.7	-7.6	6
0375mS >	1301,	50,	20,	10,	6,	18,	934,	13 = 3		-2.9	-25.4	9
0400mS >	2493,	91,	53,	18,	10,	41,	2766,	33 = 3 ****		0.9	-28.8	9
0425mS >	802,	55,	32,	11,	6,	39,	1334,	20 = 3		4.4	-23.2	9
0450mS >	26,	57,	25,	2,	3,	32,	58,	3	bntot	0.0	-5.0	5
0475mS >	19,	51,	54,	2,	2,	20,	11,	4	bntot	0.5	-8.2	6
0500mS >	33,	88,	21,	4,	33,	13,	8,	4	bntot	8.6	0.0	5
0525mS >	43,	1911,	21,	10,	998,	17,	5,	12 = 4		-5.6	-27.2	9
0550mS >	71,	2899,	10,	6,	1749,	30,	11,	10 = 4 ****		-4.4	-27.9	9
0575mS >	44,	286,	29,	9,	447,	22,	4,	4	tone3	3.9	-16.3	8
0600mS >	30,	5,	27,	4,	17,	4,	1,	1	bntot	-1.1	-4.0	6
0625mS >	12,	5,	57,	4,	3,	4,	2,	2	bntot	13.7	-7.8	7
0650mS >	41,	195,	77,	9,	99,	9,	13,	5	bntot	-5.9	-2.2	6
0675mS >	106,	2725,	58,	30,	1235,	59,	24,	21 = 4		-6.9	-21.4	9
0700mS >	156,	2237,	329,	42,	1787,	45,	14,	6	tone3	-2.0	-14.7	8
0725mS >	162,	133,	68,	13,	224,	11,	10,	3	tone3	2.8	-1.7	6
0750mS >	156,	23,	32,	6,	11,	2,	3,	1	bntot	-13.8	-2.7	8
0775mS >	169,	58,	64,	14,	7,	7,	6,	4	bntot	-8.5	-0.8	7
0800mS >	149,	372,	1165,	73,	16,	340,	11,	6	hilo	9.9	-0.8	7
0825mS >	232,	43,	2573,	70,	24,	1934,	29,	11	2ndt2	-2.5	-18.4	9
0850mS >	87,	45,	1384,	69,	35,	1858,	41,	36 = 8		2.6	-24.0	9
0875mS >	54,	32,	191,	22,	27,	90,	50,	118	tone3	-4.2	-2.3	5
0900mS >	19,	33,	67,	48,	8,	12,	31,	167	bntot	7.9	-2.9	6
0925mS >	50,	29,	102,	68,	47,	6,	27,	89	bntot	-1.2	-2.3	4
0950mS >	138,	37,	450,	62,	297,	22,	61,	13	tone3	-3.6	-6.7	6
0975mS >	65,	59,	3611,	175,	1619,	80,	36,	32	2ndt1	-7.0	-19.3	9

Portion of DFT bins sum in DTMF Tone 1 = 25%

Minimum DFT bins sum = 500

Maximum value of 2nd harmonic of Tones 1+2 = -30dB\*

Hold

DTMF tone twist limit = -12/+9dB\*

Maximum value of adjacent bin wrt Tone 2 = -18dB\*

Signal pre-filter = Wideband +/-0.50dB\*

The labels at the bottom of the screen show the decoder parameters, those with a '\*' suffix have right-click popup menus enabling the parameters can be changed live.

The Hold button at the bottom centre freezes the display for analysis, the Spacebar is the shortcut key for this button.

The Debug window is split into columns

Timestamp	25mS block decoding	
Tone Levels	Levels of the individual DTMF tones received	
Decoded Value	Decoded character 0..9, A..F	
Error	****	No Error
	bntot	Total of all the frequency components not above threshold - insufficient signal
	tone1	Ratio of the level of tone 1 to the sum of all frequency components not above
	revtw	Higher tone level is greater than lower tone level and exceeds limit - channel has
	nortw	Higher tone level is less than lower tone level and exceeds limit - channel has an
	tone3	Next largest tone after the two main tones is not suppressed sufficiently -
	hilo	Two tones detected are either both Lo tones or both Hi tones - there should be
	2ndt1	Second harmonic of main tone 1 is larger than expected, so may not be a DTMF
	2ndt2	Second harmonic of main tone 2 is larger than expected, so may not be a DTMF
Twist	Measure of the relative values of the two main tones, shown as Normal Twist (nortw)	
Tone3	Level of Tone 3 when compared with Tone 2 exceeds the preset limit	
Ratio	Ratio of levels of Tone 1+Tone 2 to overall total is insufficient	

	0	1	2	3	4	5	6	7	Error	Twist	Tone3	Ratio
	697Hz	770Hz	852Hz	941Hz	1209Hz	1336Hz	1477Hz	1633Hz		dB	dB	%
0875mS >	54,	32,	191,	22,	27,	90,	50,	118	tone3	-4.2	-2.3	53
0900mS >	19,	33,	67,	48,	8,	12,	31,	167	bntot	7.9	-2.9	61
0925mS >	50,	29,	102,	68,	47,	6,	27,	89	bntot	-1.2	-2.3	46
0950mS >	138,	37,	450,	62,	297,	22,	61,	13	tone3	-3.6	-6.7	69
0975mS >	65,	59,	3611,	175,	1619,	80,	36,	32	2ndt1	-7.0	-19.3	92

At timestamp 875mS the two tones detected correspond to DTMF frequencies 2 (tone 1 - highest level) and 7 (tone 2 - second highest level) and are shown in blue text.

The error is 'tone3' because the next largest signal shown in green text at DTMF frequency 5 (tone 3) is too close in level to DTMF frequency 7 (tone 2), the difference is -2.3dB, the relative level of tone 3 is shown in magenta coloured text as it exceeds the tone 3 limit of -18dB.

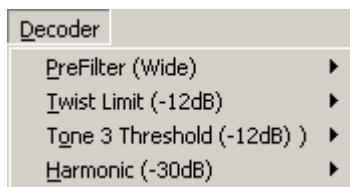
At timestamp 975mS the two tones detected correspond to DTMF frequencies 2 (tone 1) and 4 (tone 2), tone 2 is shown as normal in blue text but tone 1 is shown in magenta text which corresponds to the error '2ndt1' indicating the second harmonic of tone 1 exceeds the threshold.

The example below shows a high quality DTMF signal being decoded.

At timestamps 0, 25, & 50mS there is insufficient signal at the DTMF frequencies so the error is 'bntot', the next 3 entries correctly detect a '9', after two valid decodes the character is accepted as being good '\*\*\*\*'. A similar sequence of events follows when decoding the next character 'A'.

	0	1	2	3	4	5	6	7	Error	Twist	Tone3	Ratio
	697Hz	770Hz	852Hz	941Hz	1209Hz	1336Hz	1477Hz	1633Hz		dB	dB	%
0000mS >	15,	5,	6,	3,	7,	4,	31,	9	bntot	6.7	-3.9	58
0025mS >	17,	4,	2,	6,	4,	7,	10,	5	bntot	-4.1	-3.1	48
0050mS >	4,	6,	160,	14,	11,	5,	101,	4	bntot	-4.0	-17.2	85
0075mS >	3,	12,	332,	13,	5,	11,	329,	9 = 9		-0.1	-27.9	93
0100mS >	10,	9,	374,	9,	4,	10,	313,	7 = 9	****	-1.5	-29.8	93
0125mS >	13,	7,	333,	17,	8,	6,	277,	8 = 9		-1.6	-24.4	91
0150mS >	12,	23,	38,	7,	4,	2,	54,	5	bntot	3.0	-4.3	63
0175mS >	50,	22,	13,	9,	6,	9,	14,	30	bntot	-4.5	-2.6	52
0200mS >	287,	13,	11,	11,	9,	4,	22,	166 = A		-4.8	-17.6	87
0225mS >	300,	11,	13,	18,	6,	3,	20,	260 = A	****	-1.3	-22.4	89
0250mS >	231,	18,	6,	9,	13,	2,	7,	297 = A		2.2	-22.2	90
0275mS >	107,	13,	13,	7,	4,	3,	13,	207	bntot	5.7	-18.1	86

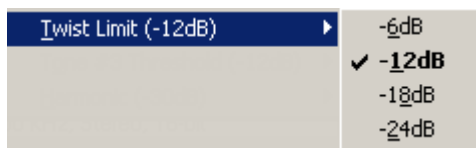
The Decoder menu sets the individual parameters of the decoder



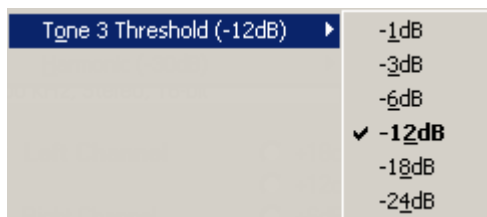
The narrowband PreFilter selects only the DTMF tone spectrum range whereas the wideband filter includes the second harmonics of the DTMF tones



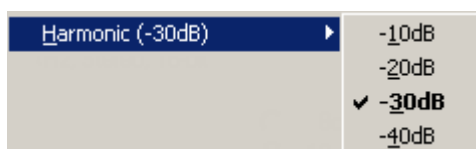
Twist is a measure of the relative amplitudes of the two most significant tones (tone 1 and tone 2)



Tone 3 threshold sets the limit for the next largest frequency component after the two most significant tones



With the Wideband prefilter selected a further check on the validity of the DTMF tones can be made by testing the level of the second harmonic of the primary tones.



In the SpotOn\TestFiles folder are a selection of DTMF wav files:-

DTMF?_48_A_M18.wav	Single pulse of DTMF 'O'.. DTMF 'F' at 48kHz 16 bit mono at -18dBFS
DTMF_48_TestToneSeq.wav	Sequence of DTMF characters at 48kHz 16 bit mono at -18dBFS
DTMF_48_TestTones.wav	Sequence of DTMF tones 0..7 and then all tones simultaneously at 48kHz 16 bit mono at -34dBFS

The DTMF decoder is enabled via the [options menu](#) selection Use DTMF Tone Trigger

# Timecode Trigger List

The Timecode Triggers dialog offers a list of timecode trigger points allocated to buttons, the list is formed of 6 columns.

The first column is the entry number followed in the next column (#) showing the state of the trigger, the third column (On) shows if the entry is enabled, clicking in the cells in the 'On' column will toggle the enabled state, this state is mimicked on the right hand edit panel as 'Trigger On'. The next three columns show cue point timecode, button number and button name respectively.

Clicking on the column headers will sort the list.

	#	On	Timecode	Btn	Name
1		✓	10:00:02:00	69	Untitled12
2		✓	10:00:05:00	65	white_noise
3			10:00:06:00	69	Untitled12
4			10:00:08:00	69	Untitled12
5			10:00:08:00	69	Untitled12
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

**Timecode Cues**

**10:00:04:00**

Grab Timecode

Timeline Timecode

10:00:08:00

▲ ▲ ▲ ▲  
▼ ▼ ▼ ▼

Button Number

69

Untitled12

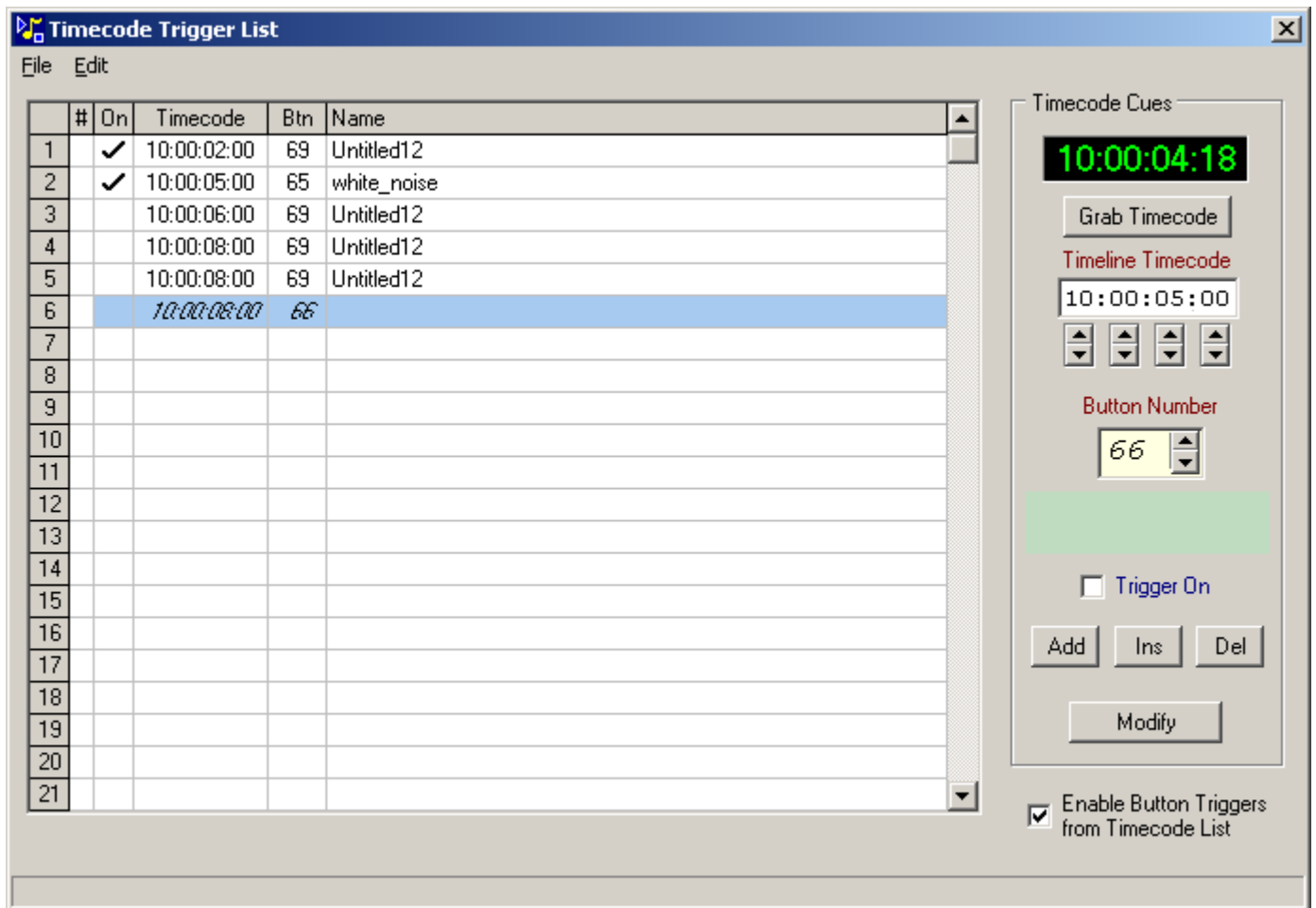
☒ Trigger On

Add Ins Del

Modify

☒ Enable Button Triggers from Timecode List

Button numbers can be entered by typing directly into the right hand Button Number section or by using the up/down nudge buttons. If the button selected is blank the number and the entry in the list will be shown in italic text as shown below in entry 6.



The timecode display in the upper right corner shows the [SMPTE timecode](#) being decoded from either an external source or directly from a button, the text will be yellow if no timecode is available.

The Mark Cue button will load the current timecode and add a new entry to the list, this can be used to make a first pass at setting the timecode cues.

The Add button will add a new entry to the end of the list, Del button will delete the selected entry and the Modify button will update the selected entry with the data in the right hand edit section.

The Insert button will insert a new entry above the selected line moving all higher numbered entries one line, if the list is full the last entry will be lost.

the State column show the current state of the cue - armed (green), playing (red) and elapsed (yellow).

	#	On	Timecode	Btn	Name
1		✓	10:00:02:00	69	Untitled12
2		✓	10:00:05:00	65	white_noise
3			10:00:06:00	69	Untitled12
4			10:00:08:00	69	Untitled12
5			10:00:08:00	69	Untitled12
6			10:00:08:00	66	
7					

Cues 1 and 2 are armed.

	#	On	Timecode	Btn	Name
1		✓	10:00:02:00	69	Untitled12
2		✓	10:00:05:00	65	white_noise
3			10:00:06:00	69	Untitled12
4			10:00:08:00	69	Untitled12
5			10:00:08:00	69	Untitled12
6			10:00:08:00	66	
7					

Cue 1 is playing and cue 2 armed.

	#	On	Timecode	Btn	Name
1		✓	10:00:02:00	69	Untitled12
2		✓	10:00:05:00	65	white_noise
3			10:00:06:00	69	Untitled12
4			10:00:08:00	69	Untitled12
5			10:00:08:00	69	Untitled12
6			10:00:08:00	66	
7					

Cue 1 has elapsed and cue 2 armed.

Items in the list can be selected by single clicks or using the standard Shift+click for a block of items.

	#	On	Timecode	Btn	Name
1			09:57:06:00	1	Sting 4 N
2			09:59:30:00	10	Round 2
3			09:59:30:00	7	Bed 5 main N95%
4			09:59:58:00	11	Round 3
5			09:59:58:00	18	vote bed
6			10:00:20:00	22	Sudden Death
7			10:00:36:22	34	HeadtoHead N

or Ctrl+click for a non-contiguous block of items.

	#	On	Timecode	Btn	Name
1			09:57:06:00	1	Sting 4 N
2			09:59:30:00	10	Round 2
3			09:59:30:00	7	Bed 5 main N95%
4			09:59:58:00	11	Round 3
5			09:59:58:00	18	vote bed
6			10:00:20:00	22	Sudden Death
7			10:00:36:22	34	HeadtoHead N
8			10:00:36:22	20	Sting 4 N

There is a right-click popup menu on the list

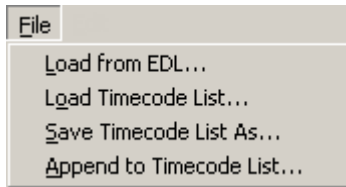
Clear Entry
Copy
Paste
Insert
Clear List
Compact List

Clear Entry allows the selected entries to be deleted, Copy will temporarily copy the selected entries to the clipboard.

Paste will paste the entries from the clipboard over the list starting at the currently selected row, Insert will move the selected entry and all higher numbered entries toward the end of the list and insert the entries from the clipboard into the blank lines created.

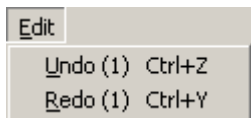
Compact List removes any blank lines and sorts the list into timecode order and finally Clear List will delete all entries.

There are two main menu sections File and Edit.



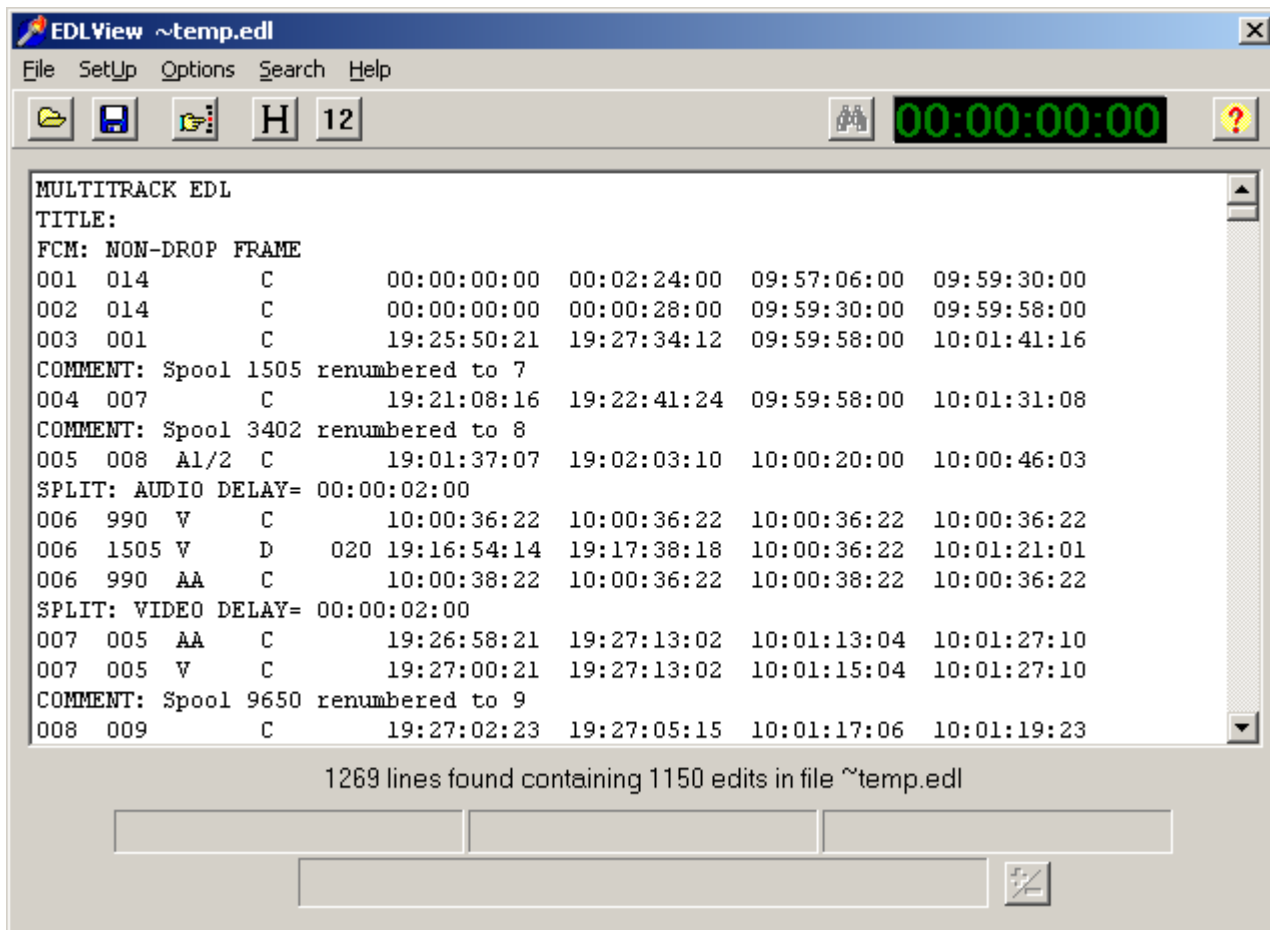
Load from EDL	Load timecodes from a section of an EDL file *.edl or *.txt
Load Timecode List	Load timecodes from disc file *.tcl
Save Timecode List As	Save timecode list to disc file *.tcl
Append to Timecode List	Load timecodes from disc and append to end of current list

Under the Edit menu are options to Undo or Redo changes



Timecode Triggers are enabled via the [Options menu](#), this option is copied by the Enable Button Triggers checkbox in the lower right of the window.

Loading timecodes from an EDL (Edit Decision List) - an EDL contains four columns of timecode along with transition instructions, a typical EDL is shown below



Using the Load from EDL option the timecodes can be extracted and displayed as a simple list, the section of timecodes to be added to the Timecode Trigger list are selected by left-click dragging across the text. Any partial lines selected will be included in the example below lines 10 to 20 inclusive will be transferred.

Only one timecode column can be used and that is selected from the options immediately below the listing, Recorder In is the default



EDL Timecode Viewer

Select lines of timecode entries to transfer into Cue List by left-click dragging across text

	Player In	Player Out	Recorder In	Recorder Out	Btn	Duration
0001	00:00:00:00	00:02:24:00	09:57:06:00	09:59:30:00	001	00:02:24:00
0002	00:00:00:00	00:00:28:00	09:59:30:00	09:59:58:00	001	00:00:28:00
0003	19:25:50:21	19:27:34:12	09:59:58:00	10:01:41:16	001	00:01:43:16
0004	19:21:08:16	19:22:41:24	09:59:58:00	10:01:31:08	001	00:01:33:08
0005	19:01:37:07	19:02:03:10	10:00:20:00	10:00:46:03	001	00:00:26:03
0006	10:00:36:22	10:00:36:22	10:00:36:22	10:00:36:22	001	00:00:00:00
0007	19:16:54:14	19:17:38:18	10:00:36:22	10:01:21:01	020	00:00:44:04
0008	10:00:38:22	10:00:36:22	10:00:38:22	10:00:36:22	001	23:59:58:00
0009	19:26:58:21	19:27:13:02	10:01:13:04	10:01:27:10	001	00:00:14:06
0010	19:27:00:21	19:27:13:02	10:01:15:04	10:01:27:10	001	00:00:12:06
0011	19:27:02:23	19:27:05:15	10:01:17:06	10:01:19:23	001	00:00:02:17
0012	19:27:02:02	19:27:03:06	10:01:16:10	10:01:17:14	001	00:00:01:04
0013	19:27:02:21	19:27:05:18	10:01:17:04	10:01:20:01	001	00:00:02:22
0014	19:27:04:06	19:27:15:09	10:01:18:14	10:01:29:17	001	00:00:11:03
0015	19:27:06:01	19:27:32:16	10:01:20:09	10:01:46:24	001	00:00:26:15
0016	19:26:59:07	19:27:20:06	10:01:13:15	10:01:34:14	001	00:00:20:24
0017	19:27:13:13	19:27:24:17	10:01:23:15	10:01:34:19	001	00:00:11:04
0018	19:27:14:21	19:27:15:15	10:01:24:23	10:01:25:17	001	00:00:00:19
0019	19:27:11:22	19:27:36:15	10:01:21:24	10:01:46:17	001	00:00:24:18
0020	19:27:15:11	19:27:15:20	10:01:25:13	10:01:25:22	001	00:00:00:09
0021	19:27:19:19	19:27:22:07	10:01:29:21	10:01:32:09	001	00:00:02:13
0022	19:27:19:06	19:27:23:01	10:01:28:07	10:01:32:02	001	00:00:03:20
0023	19:27:20:19	19:27:31:03	10:01:29:20	10:01:40:04	001	00:00:10:09
0024	19:27:34:11	19:27:54:05	10:01:34:06	10:01:54:00	001	00:00:19:19
0025	19:27:36:11	19:27:54:05	10:01:36:06	10:01:54:00	001	00:00:17:19
0026	19:27:30:18	19:27:41:19	10:01:29:17	10:01:40:18	001	00:00:11:01
0027	19:27:37:07	19:27:41:19	10:01:36:06	10:01:40:18	001	00:00:04:12
0028	19:27:40:19	19:27:54:18	10:01:39:18	10:01:53:17	001	00:00:13:24

Select timecode column to enter into Cue List

☐ Player In
 ☐ Player Out
 ☒ Recorder In
 ☐ Recorder Out

There is no option for button numbers to appear in the standard EDL so the Dissolve time is used to indicate the 3 digit button number, below the button number 020 will be associated with Player In timecode 19:16:54:14

```
006 990 V C 10:00:36:22 10:00:36:22 10:00:36:22 10:00:36:22
006 1505 V D 020 19:16:54:14 19:17:38:18 10:00:36:22 10:01:21:01
006 990 AA C 10:00:38:22 10:00:36:22 10:00:38:22 10:00:36:22
```

This can be seen in line 6 of the EDL Timecode Viewer above.

This interpretation of button numbers could be used if facilities to generate a dummy EDL is available, alternatively SpotOn can load simple text files based on the format:-

```
D 023 12:34:56:01
D 132 01:23:45:10
```

This could be produced directly in a text editor or extracted from a spreadsheet as a tab delimited file.