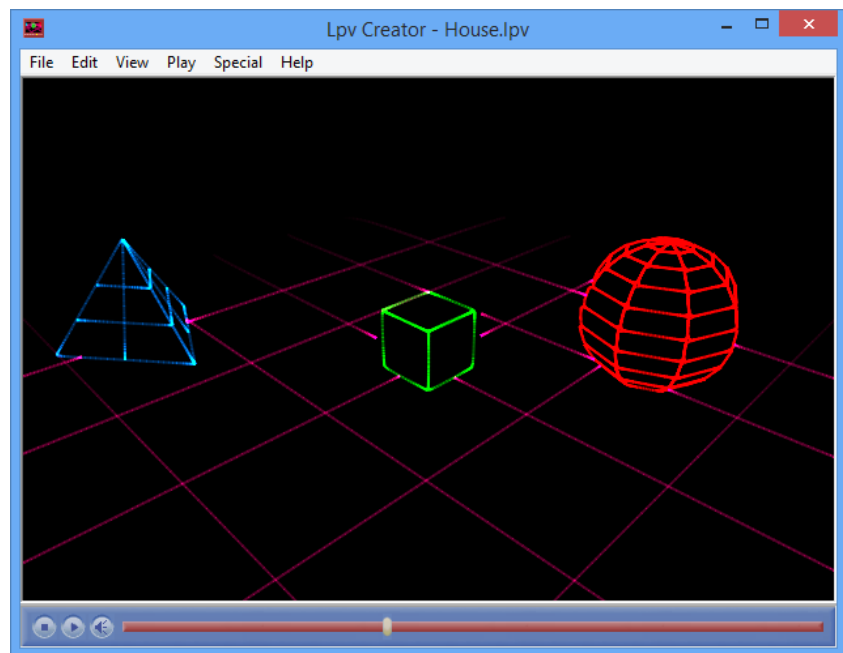


Lpv Creator



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Overview

General

Lpv Creator generates Lpv files that are played back with **Lpv Player**.

The Lpv file format is similar to other multi-media formats such as AVI or MPEG. However, a special compression procedure allows recording laser shows in very high quality with very small file sizes, which is not possible with other formats.

In order to allow replay without **Lpv Player** or for further use (e.g. for the creation of demo videos), an Lpv file can also be converted into the AVI format.

The software for playing back previously recorded laser shows, called **Lpv Player**, can be downloaded from the LaserAnimation homepage free of charge:

<https://www.laseranimation.com/en/customer-area/lasergraph-dsp/lpv-player>

About This Manual

Before installing **Lpv Creator** please read the first chapter "Installation" carefully and follow the steps described there in correct order.

The second chapter "Lpv Recording - Take One" gives you an overview of the creation of an Lpv file. Here the generation of an Lpv file is shown in a few steps, using the included demo show (Lpv Trailer) as an example.

In the third chapter "**Lpv Creator** Reference" all functions of **Lpv Creator** are explained in detail.

The appendix provides a list of the key combinations (shortcuts) of **Lpv Creator**.

Installation

Step 1 – Before Installation

The latest software version of the **LGRremote** should be installed on your PC. Your Lasergraph DSP should also be running the latest system software (version "2004/06/09" or later). Current versions and installation files can be found in the customer area of the LaserAnimation homepage:

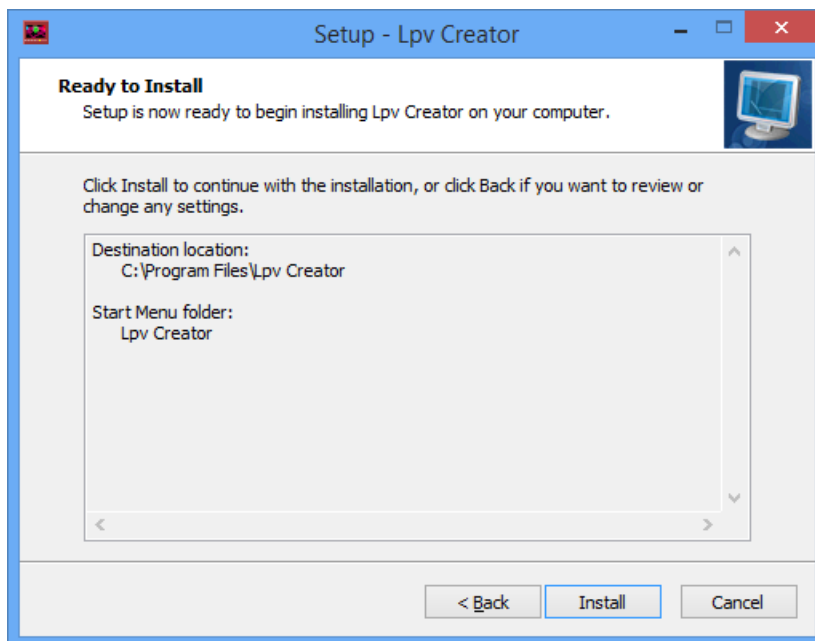
<https://www.laseranimation.com/en/customer-area/lasergraph-dsp>.

Step 2 – Installing Lpv Creator

If you received **Lpv Creator** on CD-ROM, please insert this into your CD-ROM drive. The installation is started automatically. If you deactivated the Autorun function, you can start the file Setup.exe manually if necessary.

When installing the download version, e.g. "LpvCreator--2016-04-22.exe", please execute this file to start the installation.

Please execute the installation step by step and remember the directory into which you have installed **Lpv Creator**. In the default installation this is "C:\Program Files\Lpv Creator". There you can find examples and documentation, among other things.



Step 3 – Activate the Lasergraph DSP for Lpv Creator

The valid program license is a permanent part of the *Mark 2* so an activation code is **not necessary**.

Lpv Creator needs a valid **Lpv Creator** license on your Lasergraph DSP in order to record and convert Lpv files and to create AVI files. You can install **Lpv Creator** on more than one PC, however you can only use it on one PC at a time.

You can use **Lpv Creator** with more than one Lasergraph DSP, however at least one Lasergraph DSP has to have the **Lpv Creator** license.

Important:

If you own more than one Lasergraph DSP it is advisable to install the license on the Lasergraph DSP that is available most frequently because you cannot create or edit any Lpv files without it.

Now start **LGRemote** and connect to the desired Lasergraph DSP.

Enter "ApplyLicenseKey" (short: "ALK") in the command line without parameters.



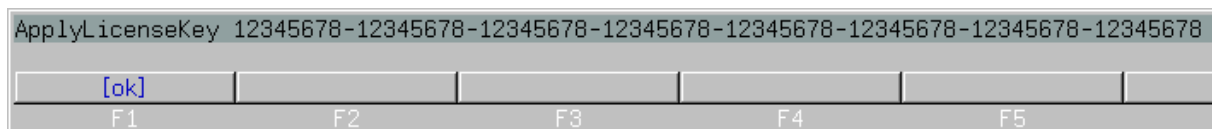
A key is displayed, the so called "Request-Code":



Please send this code (here: "1234567") to lpv@laseranimation.com. You will then receive an activation code by email.

After receiving the activation code you have to enter this on the Lasergraph DSP to install the license for **Lpv Creator**. Since this code can be very long (approx. 80 characters) we suggest that you do not type it in but rather send it to the Lasergraph DSP directly with copy and paste. Select the code in your email and then press **Ctrl+C**. Connect to your Lasergraph DSP with **LGRemote**.

Enter "ApplyLicenseKey" (short: "ALK") in the command line and then press **Ctrl+V**:



After confirmation by "ok" (or Return) the Lasergraph DSP should give a reply similar to this:



Please note that the string of characters displayed after "response=" can differ from the picture shown above. Your Lasergraph DSP is now activated for **Lpv Creator**.

Should you receive "invalid license key" as response, please check the software version of your Lasergraph DSP. It should be the most recent version, at least version 2004/06/09.

Additional Steps After Installation / Update

If a restart is necessary after an installation, your system will suggest this. If problems occur when **Lpv Creator** is started for the first time after installation, restart your PC even if this was not requested. In some cases this can solve problems.

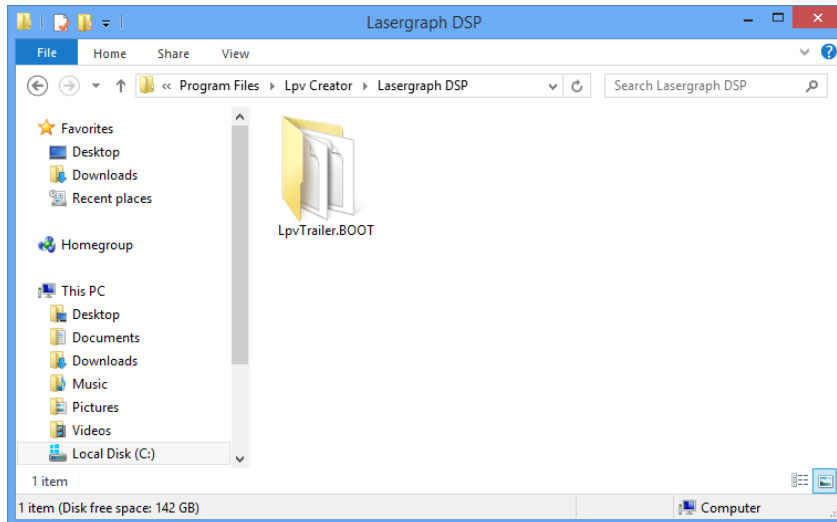
On the first start of **Lpv Creator** it is possible that a so called fog-file is created. During this process, data for the 3D fog which is used are calculated. This may take a few minutes, but it only happens once.

Lpv Recording - Take One!

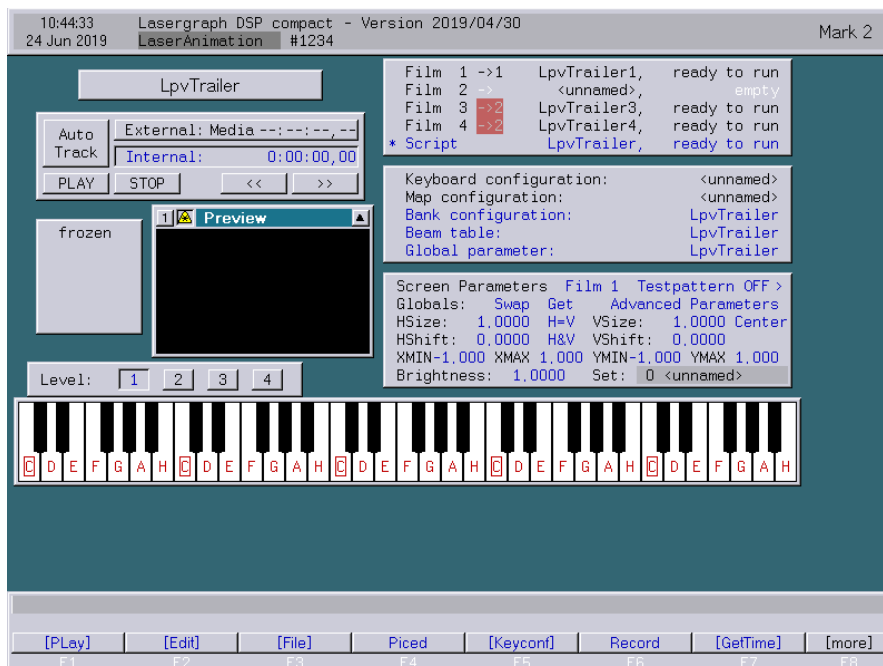
Recording a small demo laser show will give you an overview of the way **Lpv Creator** works.

Preparation

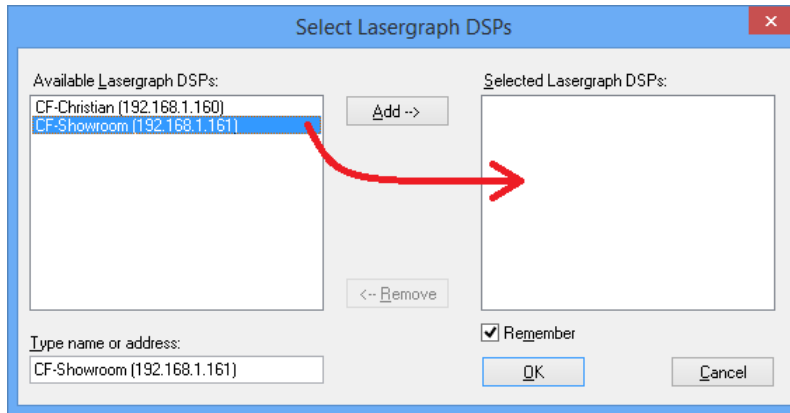
The installation directory of **Lpv Creator** contains the subdirectory "Lasergraph DSP". There you will find the demo show "LpvTrailer.BOOT". Copy this to a directory which is accessible by the Lasergraph DSP over the network.



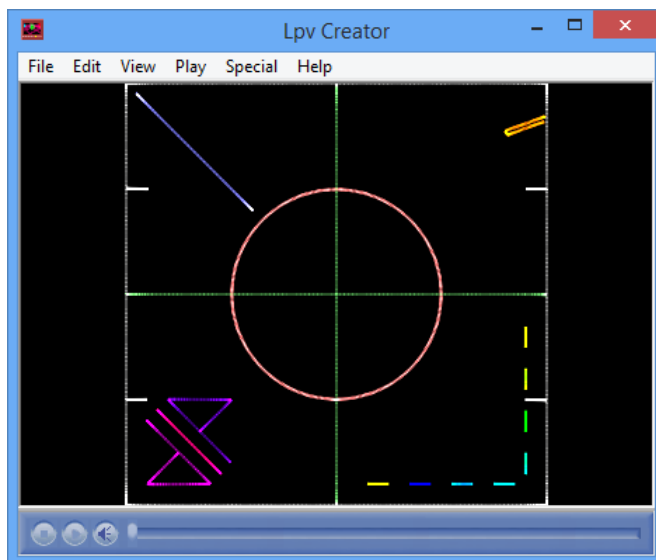
Then load this show into the Lasergraph DSP. After loading, the Lasergraph DSP should show its main screen. Everything has to be prepared so that the show can be started with "Play 0:00:00,00". However, do not start the show yet, **Lpv Creator** will do this for you.



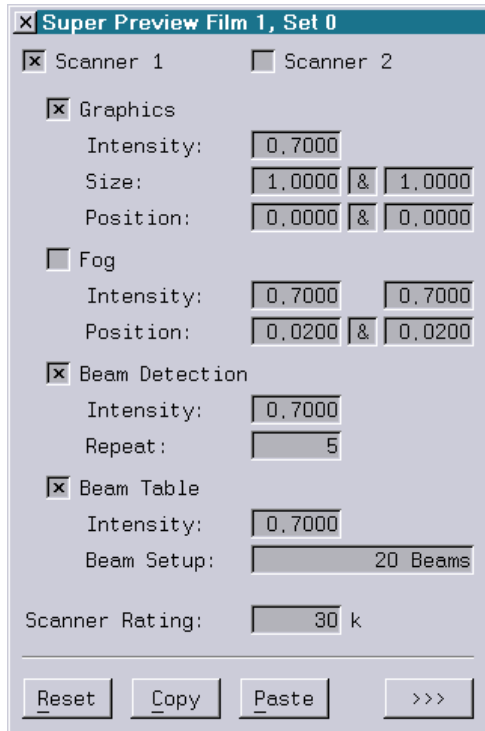
After you have started **Lpv Creator** (from the start menu: "Programs ⇒ **Lpv Creator** ⇒ **Lpv Creator**" or through the icon on your desktop), select your Lasergraph DSP (menu: "File ⇒ Select DSPs" or press **Ctrl+S**). Double clicking with the left mouse key connects the Lasergraph DSP to **Lpv Creator** (see chapter "Select Lasergraph DSP").



Activate the test picture on your Lasergraph DSP and verify the test pattern is properly displayed in **Lpv Creator**:



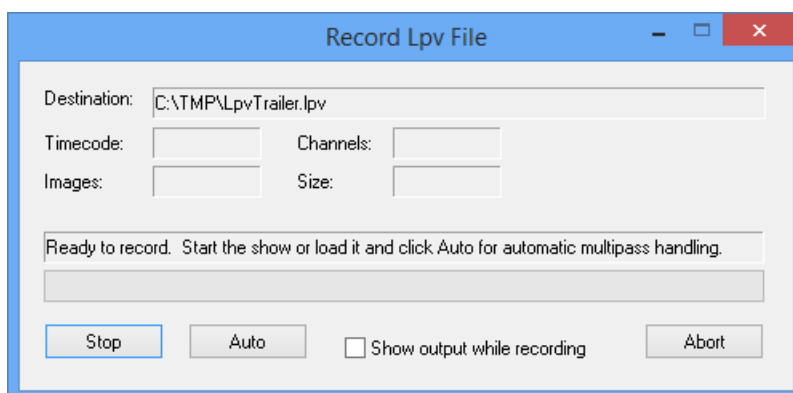
On the Lasergraph DSP you can now set the Super Preview parameters. These can be found under "Advanced Parameters ⇒ Super Preview" (see chapter "Super Preview DSP"). However, in the example "LpvTrailer" everything is already set correctly.



You should deactivate the test picture after all settings have been made since this is not supposed to be recorded here.

... And Action!

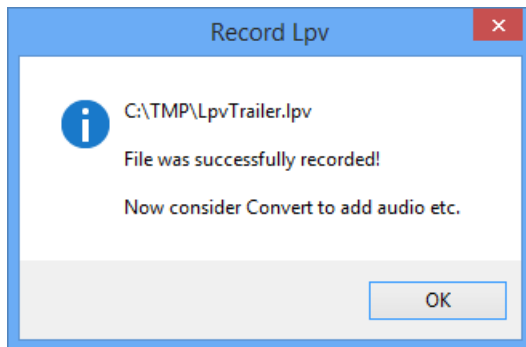
You can now record the show by selecting from the menu "File ⇒ Record Lpv" (**Alt+R**). In a dialog box you can now specify the Lpv file or overwrite an existing file. You should now see the following dialog:



Lpv Creator now waits for show data from the Lasergraph DSP. Clicking on the button "Auto" will automatically start the show and it will be recorded film by film.

This takes approx. 40 seconds for the little demo show. You can find further information about the functions in the chapter "Recording The Lpv File".

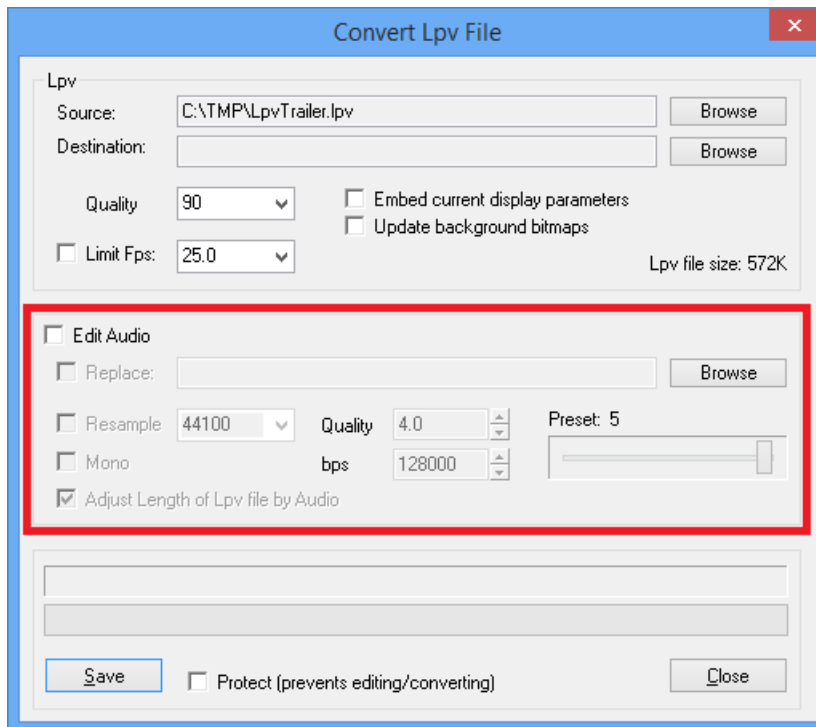
When the end of the show is reached the recording will be stopped automatically and you will see a dialog box.



Lpv Conversion

Since **Lpv Creator** at first only records the picture data, the audio data must be added afterwards.

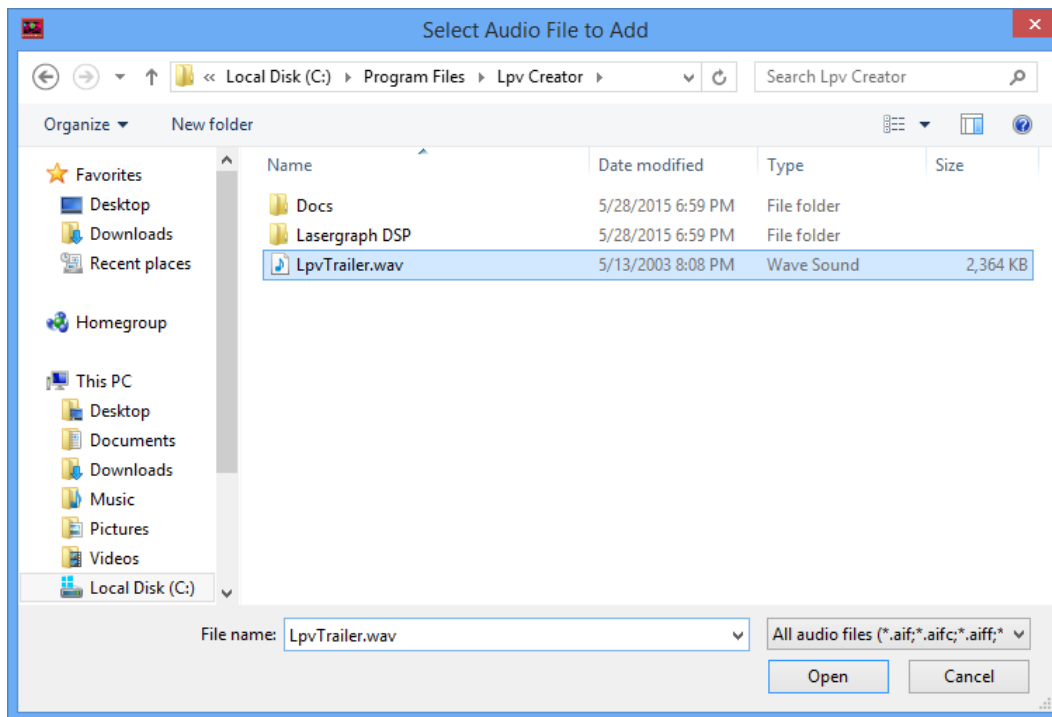
The second step, "Lpv Conversion", adds the audio data. You can start the conversion from the menu, "File ⇒ Convert Lpv" (**Alt+C**). You should see the following window:



The quality of the recorded picture can be changed with **Quality**. A value of 90 provides a very good quality. Normally you should leave it at that value because the quality decreases visibly with smaller values.

Limit Fps can be activated to limit the stored pictures per second. 20 fps (frames per second) are usually enough to retain a smooth flow of movement. For the first test you can just leave everything the way **Lpv Creator** suggests it.

For adding the audio file activate the checkbox "Edit Audio" and select the audio file with "Browse". The audio file "LpvTrailer.wav" belonging to the show LpvTrailer can be found in the installation directory of **Lpv Creator**.



Now select this file and determine the quality for the addition of the audio data and the conversion of the picture data.

With Preset 5 the sound is encoded in good quality. Stereo sound takes up about 1 MByte per minute this way. If a smaller file size is more important than good quality select Preset 3. This will make 4 minutes fit into 1 MByte.

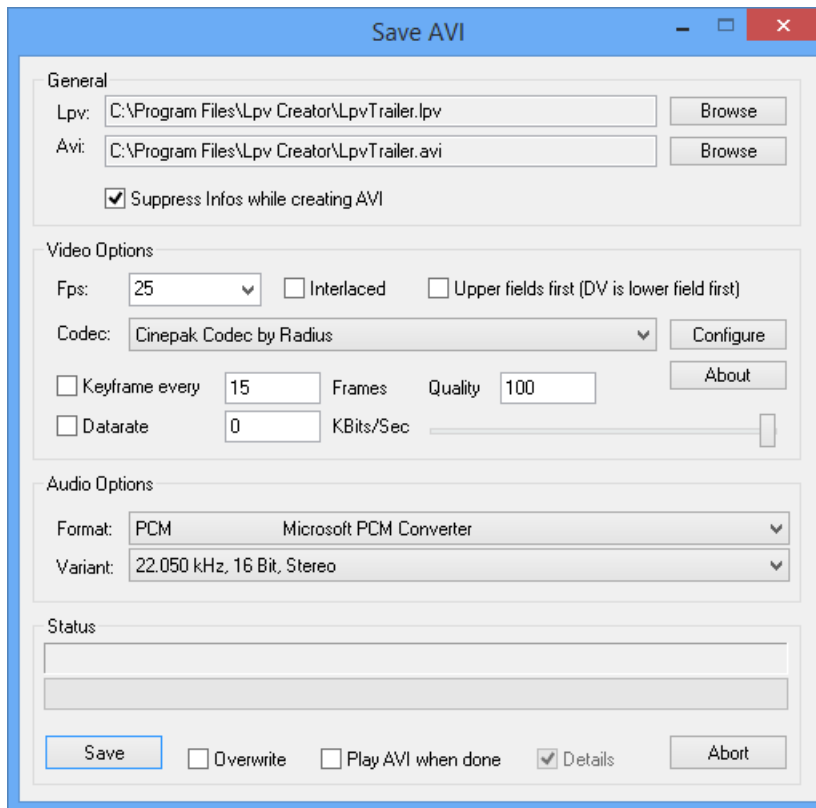
Detailed explanations of the parameters can be found in the chapter "Converting The Lpv File".

Then click on Save and confirm the overwriting of the version without sound if necessary (this will be replaced by the new one). The first Lpv file is now ready and is played back directly in **Lpv Creator**.

AVI Export

The Lpv format is ideally suited for presentations and for storage purposes. However, if your customers do not have the possibility to install **Lpv Player** (for instance with other operating systems), Lpv files can also be converted into the AVI format.

To open the following window, press **Alt+A** or select from the menu "File ⇒ Save AVI".



To create an AVI file which will run on most systems, select the "Cinepak Codec". The quality should be reduced to 90, otherwise the resulting file will be extremely large.

For the audio format you will be on the safe side with "PCM". Of course you can also choose other codecs as long as they are installed on your system. However, please note that not all codecs are available on all systems. Please make sure that you only use codecs that are installed on the systems where the AVI file is to be played back or edited.

Then click on "Save" to start the conversion.

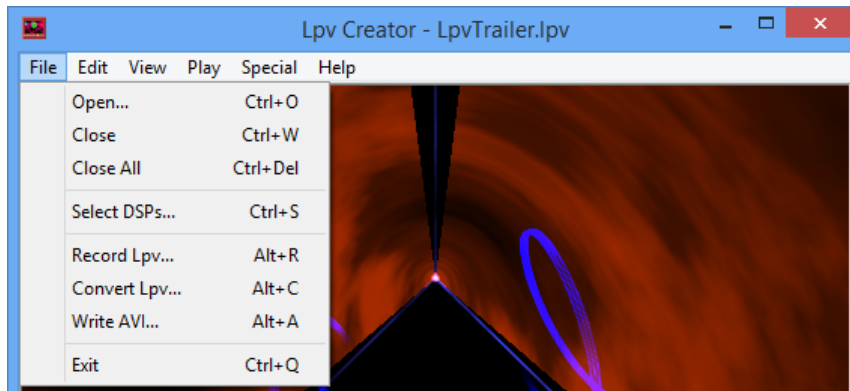
Further information regarding the AVI export can be found in the chapter "Generating An AVI File".

Lpv Creator Reference

This chapter describes all functions of **Lpv Creator** in detail.

The Lpv Creator Menu

Menu – File



Open

Opens one or more Lpv files. (**Ctrl+O**)

Close

Closes the currently opened Lpv file. (**Ctrl+W**)

Close All

Closes all opened Lpv files. (**Ctrl+Del**)

Select DSPs

Opens the dialog window for selecting the Lasergraph DSPs. (**Ctrl+S**)
(see chapter "Select Lasergraph DSP")

Record Lpv

Opens the dialog window for recording a laser show. (**Alt+R**)
(see chapter "Recording The Lpv File")

Convert Lpv

Opens the dialog window for converting Lpv files. (**Alt+C**)
(see chapter "Converting The Lpv File")

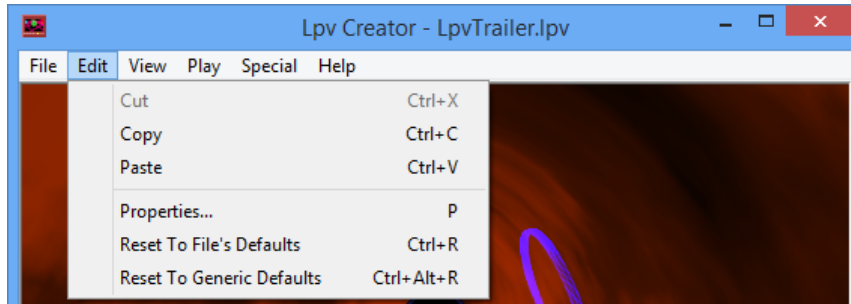
Write AVI

Opens the dialog window for creating AVI media files. (**Alt+A**)
(see chapter "Generating An AVI File")

Exit

Closes **Lpv Creator**. (**Ctrl+Q**)

Menu – Edit



Cut

Cuts an inserted background picture and places it in the clipboard. (**Ctrl+X**)

Copy

Copies the current picture to the clipboard. (**Ctrl+C**)

Paste

Inserts a picture from the clipboard as background picture. (**Ctrl+V**)

Properties

Opens the **Lpv Creator** Properties window. (**P**)
(see chapter "**Lpv Creator** Properties")

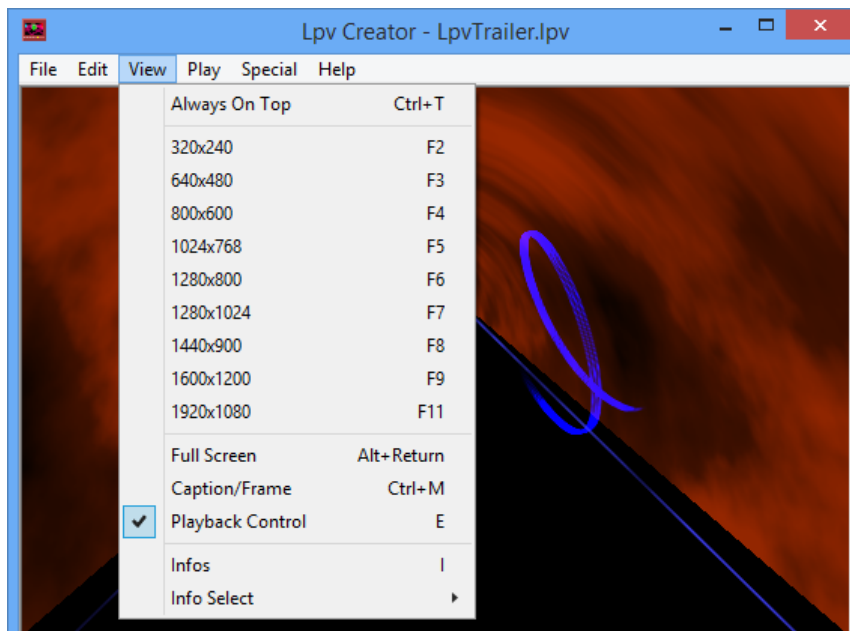
Reset to File's Properties

Returns the settings to the values stored in the Lpv file. If no special settings are stored in the Lpv files, the default settings are used. (**Ctrl+R**)

Reset to Generic Defaults

Resets the settings to the default values of **Lpv Creator**. Values that may be present in the Lpv file will be ignored. (**Ctrl+Alt+R**)

Menu – View



Always On Top

Lpv Creator is always displayed in the foreground. (**Ctrl+T**)

Resolutions

Select a predefined resolution for the **Lpv Creator** window. (<**F2**> ... <**F11**>)

Full Screen

Toggles between full screen and window display. (**Alt+Return**)

Caption/Frame

Toggle the display:

Standard window ⇔ window without menu ⇔ window without frame ⇔ standard window (**Ctrl+M**)

Playback Control

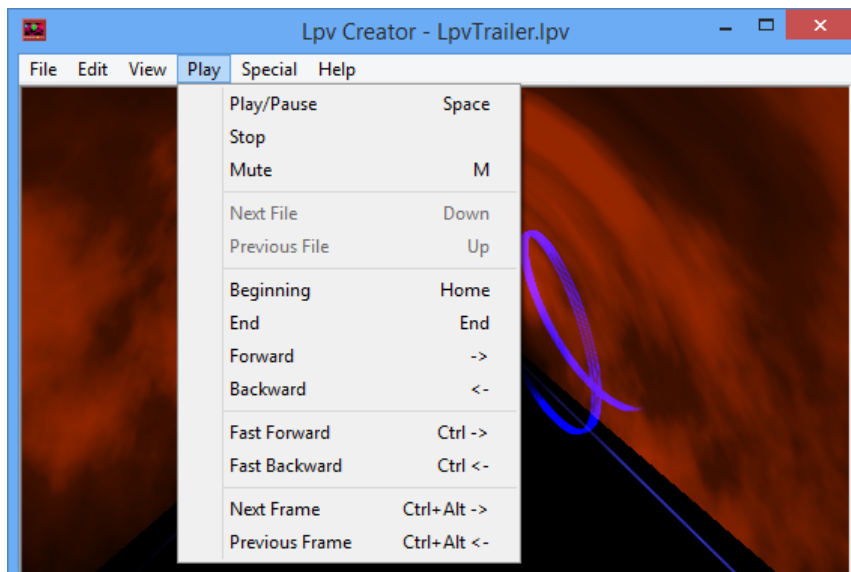
Turn the player at the lower edge of the window on or off. (**E**)

Infos

Turn the additional information on or off. If display of the information is activated, the following will be displayed:

At the top of the picture on the left hand side the timecode will be displayed. On the bottom left hand side the output frequency of the picture when it is displayed with a laser projector is shown (estimate). The display on the bottom right hand side shows how often the simulation on the screen is calculated. (**I**)

Menu – Play



Play / Pause

Start / stop the current laser show. (**Space bar**)

Mute

Turn the sound output on or off. (**M**)

Next File

Switch to the next Lpv file. (**Page Down**)

Previous File

Switch to the previous Lpv file. (**Page Up**)

Beginning

Player jumps to the beginning of the current Lpv file. (**Home**)

End

Player jumps to the end of the current Lpv file. (**End**)

Forward

Wind forward within the current Lpv file. (**→**)

Backward

Rewind within the current Lpv file. (**←**)

Fast Forward

Fast forward within the current Lpv file. (**Ctrl+→**)

Fast Backward

Fast rewind within the current Lpv file. (**Ctrl+←**)

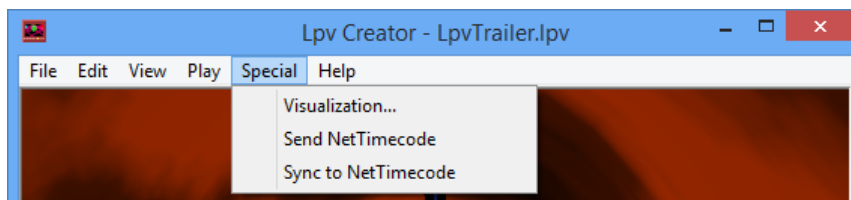
Next Frame

Jump to the next picture of the current Lpv file. (**Ctrl+Alt+→**)

Previous Frame

Jump to the previous picture of the current Lpv file. (**Ctrl+Alt+←**)

Menu – Special



Visualization

Opens a dialog where the visualization of the laser preview in a visualization software can be turned on or off and where the projectors can be assigned to the virtual laser devices within the visualization.

The Lpv Creator supports "LightConverse", "Depence V:3D", "Capture", "Realizzer 3D" and "wysiwyg" as visualization software.

Send NetTimecode

Turn the output of Net-Timecode over the network on or off.

The Net-Timecode can be used to synchronize one or more Lasergraph DSP to an Lpv.

Sync to NetTimecode

When enabled the playback of an Lpv file will be synchronized to incoming Net-Timecode.

Notes:

- As long as the playback is synchronized to external Net-Timecode audio output is disabled.

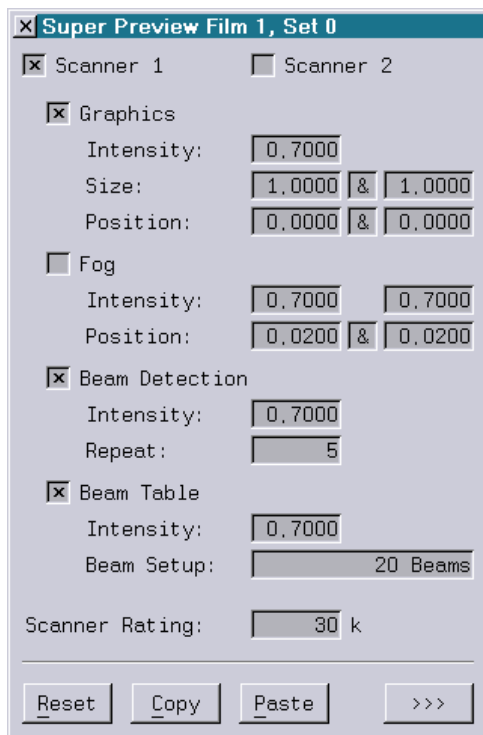
Super Preview

Overview

In order to determine the way in which a laser show will be displayed on the screen (for instance as graphic or as a beam show) you should adjust the Super Preview Parameters on the Lasergraph DSP accordingly. You will find the dialog under "Advanced Parameters" in the main screen of the Lasergraph DSP. For each set of output parameters there is a corresponding set of parameters for the Super Preview. This way it is for instance possible to set different values for film 1 (e.g. for a graphic display) than for film 2 (which may be showing beam effects).

There are several parameters that can be adjusted in **Lpv Creator** itself, but these are always effective for all films/DSPs simultaneously. We suggest that you set the parameters on the Lasergraph DSP whenever possible and only change the values in **Lpv Creator** for specific occasions. Look at the values in **Lpv Creator** as a way to adjust the display afterwards (after a show has been recorded).

Here is an overview of the parameters that can be adjusted directly on the Lasergraph DSP:



Scanner 1 & Scanner 2

Number of scanners generating an output. If two scanners are activated they display an identical picture mirrored along the Y-axis.

Graphics

By activating this parameter, the laser picture is displayed as a graphic. If "Fog" is turned off this is equivalent to a graphics projection onto a screen. Together with "Fog" the effect is more one of a gauze installed between the point of view and the scanner.

"Intensity" is used to adjust the brightness of the graphic. Higher values result in brighter lines.

"Size" influences the size of the picture, where the X- and Y sizes can be adjusted separately or simultaneously by keeping the mouse button depressed on the "&"-symbol and dragging.

"Position" is used to set the position of the picture. Here it is also possible to set the X- and Y positions separately or simultaneously using "&".

Fog

If you activate this parameter, the virtual room fills with fog. This then floats in clouds through your preview picture. "Intensity" sets the brightness of the fog. The values can range from barely visible fog (0.1) to completely filled areas. With "Position" you determine the position of the scanners. X- and Y positions can be set separately or simultaneously ("&").

Beam Detection

If this parameter is activated, the Super Preview performs an automatic beam detection. This means that points which have repeats will be displayed as bright lines. The "Intensity" of the lines can be set. The parameter "Repeat" determines the number of repeats necessary to display a line as a "beam".

Beam Table

By activating this parameter beams from the beam table will be simulated. Two predefined options are available: A beam table for 8 positions and one for 20 positions.

"Intensity" determines how clearly the beams will be accentuated.

Scanner Rating

Allows simulation of different types of scanners.

Reset

Resets all parameters to their default values. All changes will irrevocably be lost.

Copy

Copies all parameter values to the clipboard. This will be available until the Lasergraph DSP is turned off / restarted.

Paste

Inserts the parameter values from the clipboard into the current Super Preview set. This will overwrite old settings irrevocably.

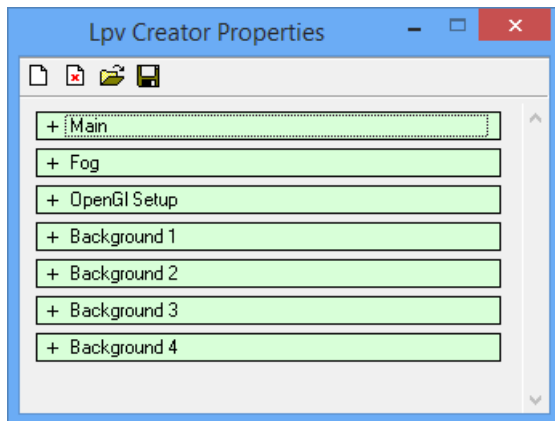
Lpv Creator Properties

Overview

The **Lpv Creator** properties allow modifying the display of the show loaded on the Lasergraph DSP resp. the current Lpv file.

Temporary changes of the graphic or beam output can be made here. This is also used to modify the intensity and type of fog, fine tune your graphics card settings or add background images.

The **Lpv Creator** properties window is reached by selecting from the menu "Edit ⇨ Properties" or using the shortcut **P**.



Default, Load and Save



"Reset all Parameters to default (As defined by Lpv File)"

The first icon from the left sets all parameters to the values defined in the Lpv file.



"Reset all Parameters to default (Ignore Lpv Parameters)"

The second icon from the left resets all parameters to the **Lpv Creator** default values. Settings stored in the Lpv file are ignored.



"Load Parameters from File"

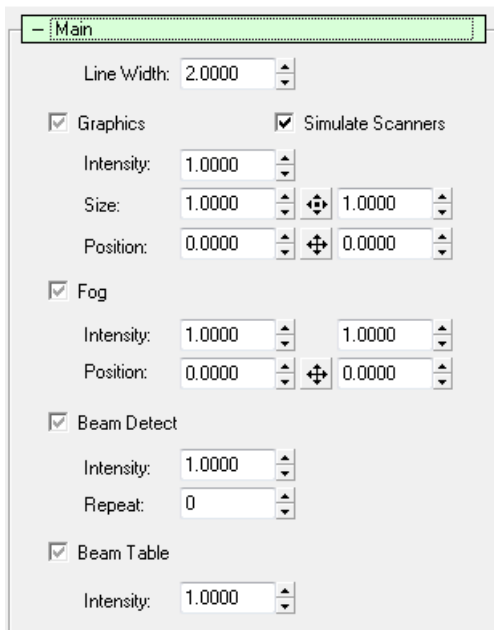
Opens the dialog box for opening the current settings. These can be exchanged at will between **LGPreview**, **Lpv Player** and **Lpv Creator**.



"Save current Parameters to File"

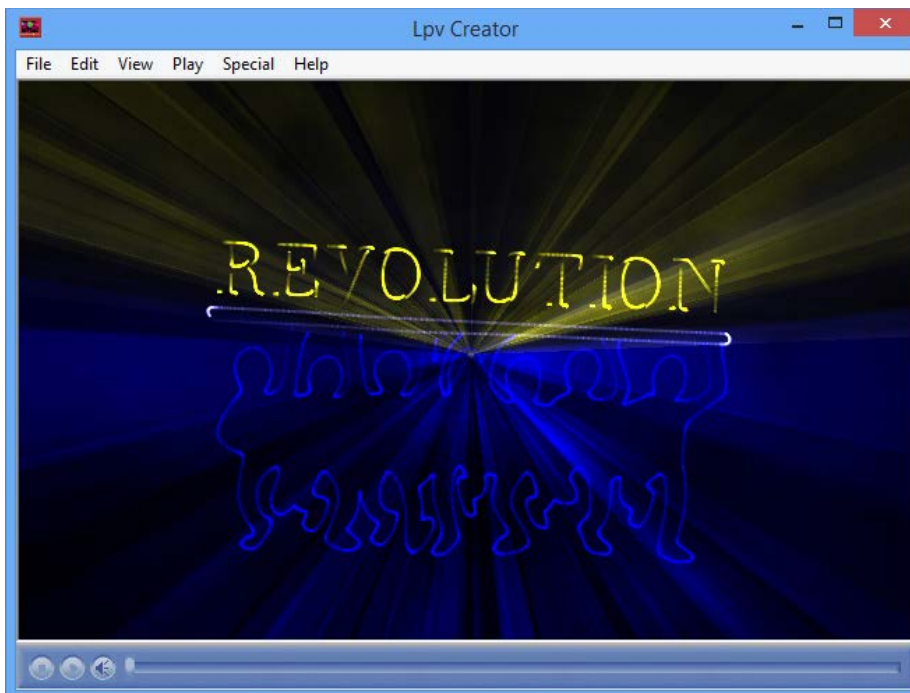
Opens the dialog box for saving the current settings. This way you can reuse a setting later without the trouble of adjusting all values again. The background pictures are also saved with all settings.

Properties – Main



Overview

Except for the "Line Width", all values here correspond to the settings that you can also make on the Lasergraph DSP (Super Preview). However, these values are always effective for all channels. We recommend that you only change the **Lpv Creator** values in special circumstances, for instance if you want to change something after the recording. Normally you should set the parameters on the Lasergraph DSP because this is more flexible and values can be set individually for each channel. Use the **Lpv Creator** values for example to add some fog to a graphic show afterwards:



Some checkboxes can have three states: default, active, inactive. The setting of the properties refers to the parameters of the super Preview of the same name. "Graphics" in **Lpv Creator** is equivalent to the setting "Graphics" in the Super Preview of the Lasergraph DSP.

Input fields are marked in yellow if the current setting is not the default value. This lets you see at a glance which values you have changed. You can reset each field individually to its default value with **Ctrl+D**.



Default. The value specified in the Super Preview of your Lasergraph DSP is used here.



Active. Activating the setting. The setting made in the Super Preview is ignored.



Inactive. Deactivating the setting. The setting made in the Super Preview is ignored.

Some values are effective in addition to the settings made on the Lasergraph DSP.

Line Width



This parameter can only be adjusted on the PC. The value specifies the line width of the graphic in pixels. The default value of 2.0 usually results in the best quality. With full screen display and high resolution, wider lines may result in a better picture. It may also be better to set wider lines (2.5 to 3.0) if a conversion to AVI or video is planned.

Unfortunately not all graphics cards support arbitrary adjustment of the line width.


Graphics

By activating this parameter, the laser picture is displayed as a graphic. If "Fog" is turned off this is equivalent to a graphics projection onto a screen. Together with "Fog" the effect is more one of a gauze installed between the point of view and the scanner.

"Intensity" is used to adjust the brightness of the graphic. Higher values result in brighter lines.

"Size" influences the size of the picture, where the X- and Y sizes can be adjusted separately or simultaneously by keeping the mouse button depressed on the -symbol and dragging. With "Position" you determine the position of the picture. Here X- and Y positions can also be set separately or simultaneously with .

Fog

If you activate this parameter, the virtual room fills with fog. This then floats in clouds through your preview picture. "Intensity" sets the brightness of the fog. The values can range from barely visible fog (0.1) to completely filled areas. With "Position" you determine the position of the scanners. X- and Y positions can be set separately or simultaneously (.

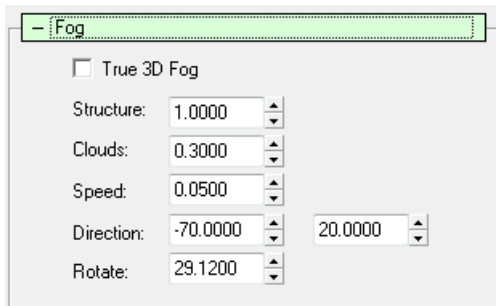
Beam Detect

If this parameter is activated, the Super Preview performs an automatic beam detection. This means that points which have one or more repeats will be displayed as bright lines. The "Intensity" of the lines can be set. The parameter "Repeat" determines the number of repeats necessary to display a line as a "beam".

Beam Table

By activating this parameter beams from the beam table will be simulated. Two predefined options are available: A beam table for 8 positions and one for 20 positions. "Intensity" determines how clearly the beams will be accentuated.

Properties - Fog



Overview

Here you set the details of the fog. These settings are only done on the PC. Please note that you need a fast graphics card with OpenGL support to achieve optimal graphics display.

True 3D Fog

Activating True 3D Fog makes the display of the fog even more realistic. However, this is not supported by all graphics cards. Under certain circumstances it is also possible that even though it does work the calculation is very slow.

Structure

The structure of the fog can be set on a range from unstructured (Haze, 0.0) to a clear, defined, structured display (1.0).

Clouds

Changes the number of clouds from no clouds (0.0) to many, clearly defined clouds (1.0).

Speed

The speed with which the clouds float through your virtual showroom can be set. Here the value 0 means that the clouds do not move.

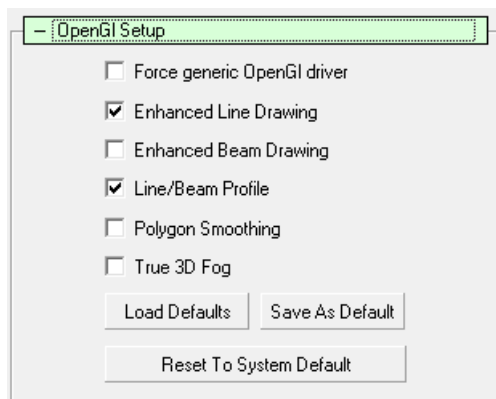
Direction

Define the direction in which the virtual clouds will move.

Rotate

This parameter lets the clouds rotate around the Z-axis.

Properties – OpenGL Setup



Overview

In this section you have the possibility to set OpenGL parameters. The standard configuration usually leads to the best display. In individual cases it may be possible to improve or accelerate the output by optimizing these parameters for your graphics card. **Lpv Creator** analyses your configuration and tries to determine the optimal settings. These are referred to as System Default. If you find a better configuration, you can save this so that it is automatically activated the next time **Lpv Creator** is started. This is referred to as Default.

Force generic OpenGL driver

This parameter activates the software OpenGL driver by Microsoft® Windows®. Only use this if display errors occur. In practice this driver is very slow and it may take several seconds for a picture to be calculated.

Enhanced Line Drawing

When this parameter is activated the lines are drawn in a special mode. With some graphics cards this will improve the display.

Beam Profile

Lines are not cut sharply at the edges, they have a profile. This looks a little more realistic. Only works if "Enhanced Line Drawing" is activated.

Polygon Smoothing

When this option is supported by the graphics card the picture usually looks clearer and so called steps are avoided. This option usually does not make the display slower if it is supported by the graphics card. It is therefore superior to the "Global Scene anti-Aliasing" which you may find in the setup of your graphics card. Here it also depends on the graphics card if the picture is actually improved.

True 3D Fog

see chapter "Properties - Fog" (Parameter "True 3D Fog")

Load Defaults

Stored default values concerning the OpenGL setup are loaded.

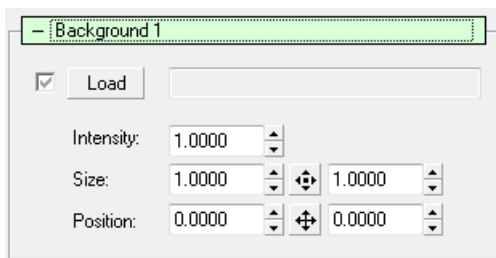
Save As Defaults

The current OpenGL configuration is saved as default configuration.

Reset To System Default

The OpenGL configuration is reset to the values detected by Lpv Creator.

Properties – Background



Overview

You can integrate up to four background pictures, logos or watermarks into your preview. Accepted file formats are JPEG or PNG (PNG = Portable Network Graphics).

Another possibility for adding pictures to your Lpv file is to copy the desired picture to the clipboard from a graphics editing software with **Ctrl+C** and to then add it to **Lpv Creator** as a background picture or logo with **Ctrl+V**. Pictures added this way will however be integrated into the Lpv file as uncompressed bitmap graphics (BMP files). The Lpv file may get very large this way. It is therefore advisable to convert bitmap graphics into the JPEG or PNG format first in order to save disk space.

Load

Activate this checkbox to display the specified background picture. Clicking on the button "Load" will open a selection box where you can choose a graphic.

Intensity

Specify the intensity / brightness of the background picture. It often makes sense to reduce the intensity of background pictures or watermarks so that they will not interfere with the laser simulation.

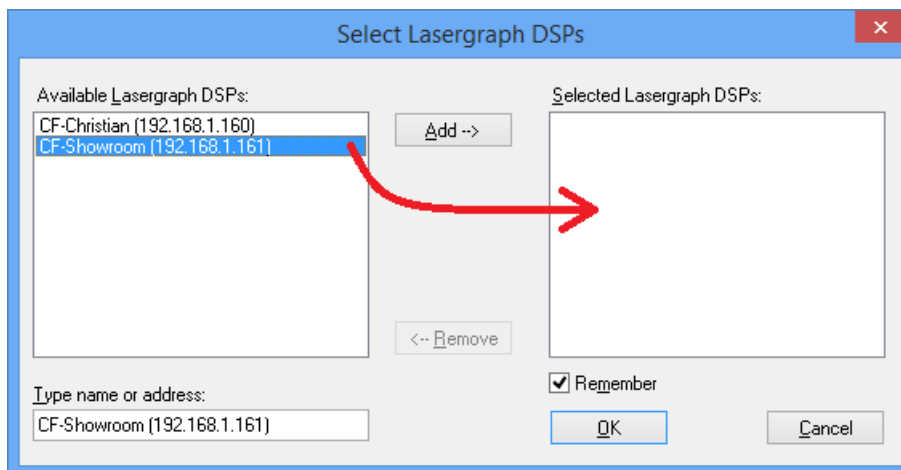
Size

Specify the size with this parameter.

Position

This parameter determines the position of the background picture. Usually background pictures will be oriented toward the center. At +/-10 you can also "affix" the pictures to one of the edges.

Select Lasergraph DSP



Overview

In this window you select the Lasergraph DSPs which will be the sources of the shows you want to record. You can select more than one Lasergraph DSP, but the first one has to have a valid license for **Lpv Creator**.

Available Lasergraph DSPs

Lists all available Lasergraph DSPs.

Add

Add the selected Lasergraph DSP from the list "Available Lasergraph DSPs".

Remove

Remove the selected Lasergraph DSPs from the list "Selected Lasergraph DSPs".

Remember

Lpv Creator saves the selected Lasergraph DSPs and reestablishes the connection automatically at restart.

Recording The Lpv File

Overview

The recording is always the first step in the creation of an Lpv file. Before the recording can begin you have to select a destination file. You can either enter this as a file name or select an existing Lpv file to be overwritten.

When the recording window is opened, the name of the show currently loaded on the Lasergraph DSP will be entered as the default file name.

Select "Save" to get to the recording. The recording window is opened and **Lpv Creator** is ready to record.

You can record a show either manually or automatically. It is usually advisable to record shows automatically because **Lpv Creator** will then perform all required operations.

Clicking on the button "Auto" will start the automatic recording. If you have a Lasergraph DSP *workstation* with more than one DSP card, **Lpv Creator** now selects the fastest output card for the recording. Shows with more than one output, e.g. graphic show on film 1 and beam show on film 2, will be recorded separately film by film. Each film will be displayed by the card selected by **Lpv Creator**. This multi pass method makes it possible to record multi scanner shows even from a Lasergraph DSP *compact*. And on a *workstation* the amount of data generated is limited to one channel to avoid overflowing the network connection.

Before you start automatic recording, the Lasergraph DSP has to be in root mode and the loaded show must be one that can be started with "Play 0:00:00,00". The timecode has to be ended automatically in the script, otherwise **Lpv Creator** will not recognize the end of the show and will continue running.

If you want to add sound later you have to keep in mind that the audio track is always inserted at 1:00:00,00. If necessary, adjust the timescript accordingly.

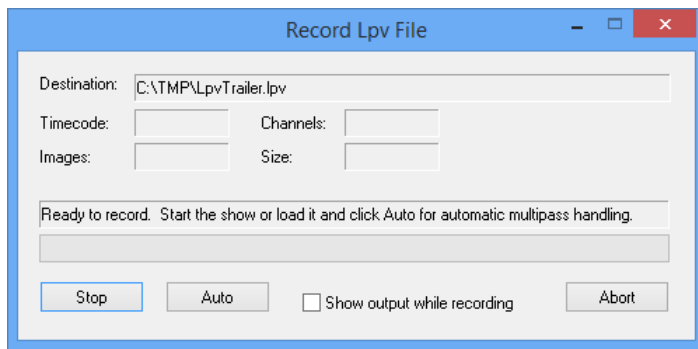
If using the automatic mode is not possible, for instance when recording interactive shows or games, you can also start the show yourself on the Lasergraph DSP. You then have to end the recording manually in **Lpv Creator**. If the show normally runs without a script (film is started by Run), we suggest that you use a simple script so you can establish the timecode. (If a show is started with Run, the timecode is undefined from the point of view of **Lpv Creator**.)

Important:

The laser output is deactivated during the automatic recording. For safety reasons you should not activate the laser output on the Lasergraph DSP during the recording, because all films contained in the show, beam- as well as graphics shows, are displayed by the same DSP card.

After the automatic recording is finished, the state of the show is reset to the original state, i.e. the state before the recording.

During the recording it is advisable to leave the display in the preview window disabled so that it does not interfere with the recording, causing unwanted interruption.



Destination

Name and directory of the Lpv file into which the laser show is recorded.

Timecode

Current timecode of the show which is to be recorded.

Channels

Number of films recorded so far.

Images

Number of pictures recorded so far.

Size

Current size of the Lpv file during recording. The file can get quite large during recording because the data are initially stored without compression. After the recording is finished the file size will be reduced by the built-in compression.

Show output while recording

Display of the laser show during the recording. Should only be used on fast systems because otherwise the recording may be disturbed.

Stop

Ends the manual or automatic recording of a show. The part recorded so far will be saved.

Auto

Starts the automatic recording of a show. This only works if the show has already been loaded and the Lasergraph DSP is in the main screen. The show has to be one that can be started with "Play 0:00:00,00". If sound is to be added, the actual show should be synchronized to 1:00:00,00. If necessary, adjust the timescript accordingly (for example with Retime).

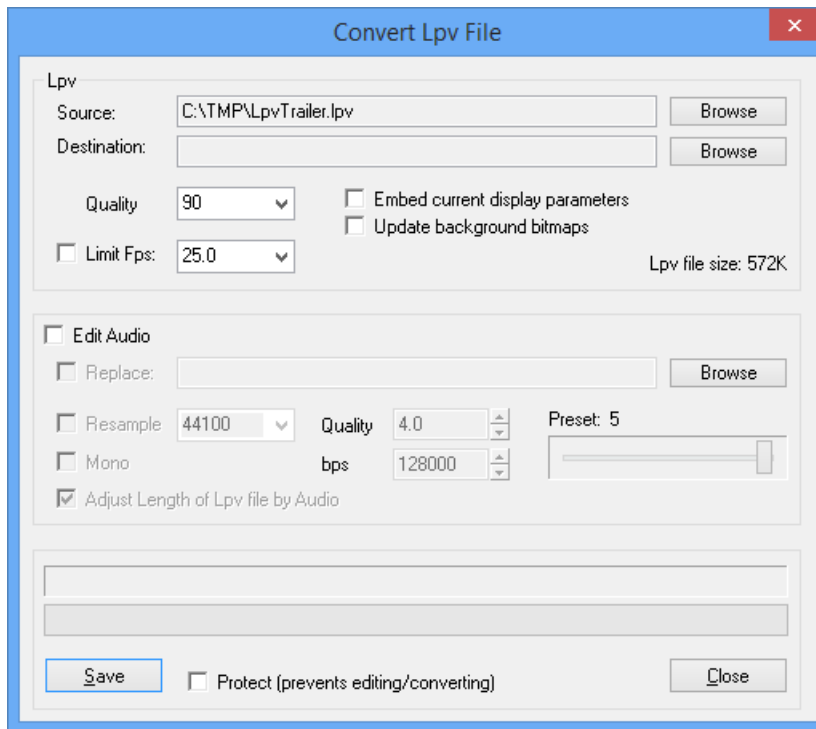
See the timescript of the included example "LpvTrailer.BOOT"!

Converting The Lpv File

Overview

The conversion of an Lpv files serves different purposes. One application is converting a recorded Lpv file to add sound. Another application is to create lower quality versions of an existing Lpv file by reducing the quality, the frame rate or the audio quality (e.g. for internet download).

A conversion is also necessary to embed background pictures.



Source

Name and directory of the Lpv file that is to be converted.

Directly after a recording the name of the most recently recorded Lpv file is displayed in this field. To convert another file, open the dialog box using the button "Browse".

Destination

Name and directory of the Lpv file that is to be written.

You have to enter a file here. If you leave this field empty and click "Save" to start the conversion, you will be prompted to enter a destination file.

If an Lpv file is entered at "Source", the same name and directory will automatically be entered here. "Source" and "Destination" may be identical, the current file will then be overwritten with the new version.

If you want to change this, open the corresponding dialog box with the button "Browse".

Quality

Value of the picture quality (0 ... 100).

This value sets the picture compression for the Lpv file. 90 results in a good quality. Usually you should leave it at this value. Smaller values will result in smaller files, however the quality will decrease visibly. In most cases it is better to reduce the frequency (fps) because this is usually less disturbing subjectively than reducing the quality here.

Limit Fps

At first all pictures are recorded into the Lpv file without limitation. In individual cases this may have the result that 50 or more pictures are saved per second. Usually this will not be an advantage. Therefore you can limit the number of pictures saved per second with "Limit Fps". You will see practically no difference at 20-25. If you want to reduce the file size even further, you can also try 10 or 15.

Do not use this option if you plan to convert to interlaced AVI or use at least twice the target frames per second, e.g. use 60 for 30 fps NTSC video.

Embed current display parameters

The set preview parameter values are saved in the Lpv file. We do not usually recommend this. It is usually better to set the "Super Preview" parameters correctly on the Lasergraph DSP before the recording.

However, if you want a show to be displayed differently from the way it was recorded, you may modify **Lpv Creator's** parameters and save (embed) the values into the Lpv file.

Update background bitmaps

Save background pictures in the Lpv file. It is possible to integrate up to four background pictures into an Lpv file in the preview parameters (see chapter "Properties - Background"). However, these will only be integrated with the Lpv file if you explicitly activate this here.

Edit Audio

Adding / replacing the integrated audio file.

Activate this parameter if you want to replace an existing audio file or integrate an audio file into an Lpv file.

When this parameter is activated you can access the following parameters.

Replace

Adding or replacing existing audio files.

If an Lpv file does not have sound yet, activate this parameter and click the button "Browse" to select an audio file. Supported audio formats are WAV and OggVorbis. Deactivate this parameter if you only want to change the audio settings for the sound already existing in the Lpv file.

Resample

Changing the sample frequency of the audio file. (1000 Hz ... 96000 Hz)

Activate and change this parameter in order to integrate the audio file into the Lpv file with a sample frequency of your choice. As a rule a higher frequency will result in better quality. Here you can for instance reduce the size of a file sampled with 44100 Hz by reducing the frequency to 22050 Hz. Of course this will also reduce the quality.

Mono

When this parameter is activated, the audio file will be saved in mono (one-channel audio). This will usually reduce the file size at the cost of a reduced quality.

Quality

The audio quality controls the performance of the compression. With higher values the quality will increase, but so will the size of the file.

For a good quality choose 4, higher values will hardly improve the result. This is equivalent to an average of 1MByte per minute (with 44100 Hz, stereo).

If you want to reduce the size of the file at the cost of the quality, reduce the value accordingly. This value is closely linked to bps, because a higher quality also leads to a higher data rate and vice versa.

bps

Data rate in bits per second (bps). Determines how many bits per seconds are to be used for the sound. This value is closely linked to quality, because a higher data rate leads to a higher quality (and vice versa).

Adjust Length of Lpv file by Audio

During recording, the beginning and end of the Lpv file are determined according to the first/last picture. However, sometimes the sound starts before the first picture or does not end with the last picture. When you activate this option the sound will be analyzed and if necessary the beginning and the end will be extended.

Protect

Protects your Lpv file against further changes. A protected Lpv file can then not be altered in any way. It also cannot be converted into an AVI file. Existing background pictures such as watermarks or copyrights cannot be removed. Please bear in mind that the protection cannot be removed from a file in any case, not even by yourself!

Note:

To prevent misuse of your Lpv files, add a logo or watermark to your Lpv file (see chapter "**Lpv Creator Properties**") and then save it with "Protect".

Generating An AVI File

Overview

An AVI file describes a multimedia file containing audio and video data. However, if an AVI file is recorded or converted in high quality, its size can get very large in contrast to the size of the Lpv files. It may still make sense to convert an Lpv file into an AVI file, for instance to allow further use in a video program.

If you want to record your laser shows on video later (DV, MPEG or the like), you should take into account the specific aspect ratios and resolutions. Picture points (pixels) on computer monitors are usually square shaped. This is not true for PAL or NTSC displays.

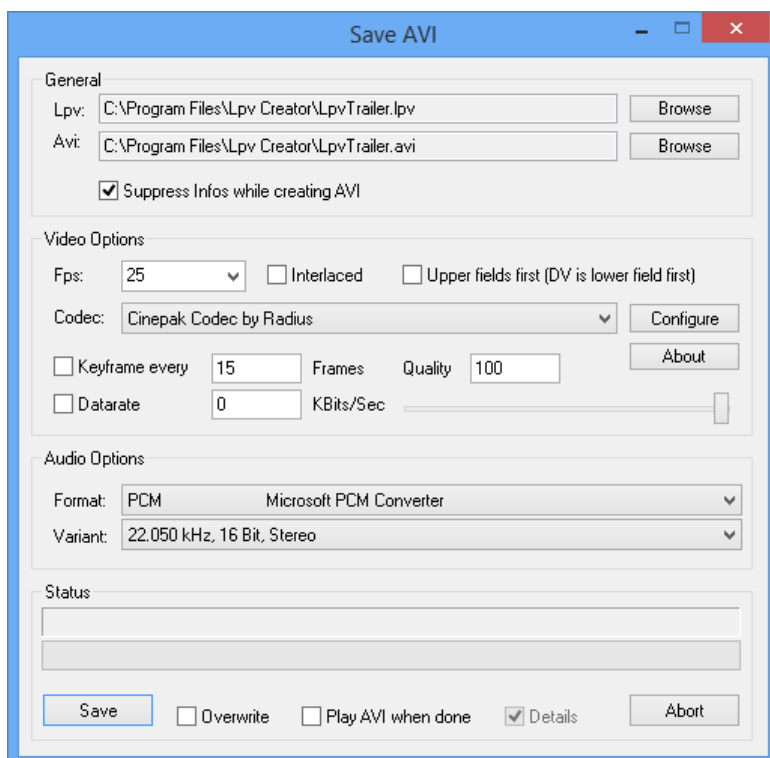
Therefore special aspect ratios have to be considered to prevent distortions. **Lpv Creator** has two predefined settings with correct aspect ratios and resolutions for PAL (720x576, 25fps, 54:59) and NTSC (720x480, 29.97fps, 11:10).

This will distort the display on the computer monitor, however display in PAL or NTSC will be correct this way. Prepare everything so that display is correct on the computer monitor. Then press **Alt+F1** to adjust for PAL, or **Alt+Shift+F1** for NTSC.

To open the AVI dialog select from the menu File ⇒ Write AVI. In the dialog you can control explicitly which codec will be used to encode the video and audio files.

Clicking "Save" will start the generation of the AVI file.

A progress display will inform you of the estimated time for the conversion. If you have activated "**Play AVI when done**", the AVI file will be played back automatically at the end.



Lpv

Name of the Lpv file which is to be converted into an AVI file.

Avi

Name and directory of the AVI file which is to be created.

After an Lpv file is selected, this field contains the name of the AVI file. The same name and path is used automatically with the file suffix for AVI files.

Suppress Infos while creating AVI

During playback of an Lpv file additional information is displayed, for instance the time code. You will normally not want this information to also be part of the AVI file. With this option the display of this information can be suppressed when generating the AVI file (default setting).

Fps

Frame rate in frames per second (0.1 ... 120 frames per second).

Set the desired frequency here. The European television standard PAL is set at 25 frames per second, the American television standard NTSC uses 29,97 frames per second. If you only want to play back the file on a computer you can usually decide at will which frame rate is the right one for your purpose. 20 Hz are usually sufficient to let movements appear smooth.

Interlaced

Enable this option to create interlaced AVI files for later recording on DV or conversion into DVD format. This improves quality for playback on TV devices.

Upper fields first

Determines the order of the half pictures when creating interlaced AVI files. DV always uses "lower field first".

Codec

Here you select the codec which is used to compress the picture data in the AVI file. You can also select "<Uncompressed DIB>". The data will then be saved without compression. This may make sense when you want to process the file further. However, the files will get very large this way.

Which video codecs are available for selection here depends on the installation of your system. The "Cinepak Codec" is almost always available. This codec will not result in the best quality, but AVI files generated with this codec can be played back on almost any Windows® system.

Configure

Opens the dialog box for configuration of the selected codec. For information about this see the documentation of the codec. Not all codecs support this method of configuration.

About

Opens the About box of the selected codec (displays information about producer and version). Not supported by all codecs.

Keyframe every "x" Frames

Enforcing keyframes. Support depends on the codec. Modern codecs reduce the data quantity by only saving the changes in comparison to the previous picture (most of the time only part of the picture changes). In contrast, keyframes do not need information about neighboring pictures. This takes up more disk space, but without keyframes a file could only be played back from the start. Jumping in (e.g.) in the middle of the complete film would no longer be possible. It is therefore advisable to enforce keyframes at least at certain intervals. For instance, a value of 250 is equivalent to one keyframe every 10 seconds (at 25 fps).

If a film is to be processed further, for instance in a video editing program, it makes sense to choose even smaller values here so that the pictures can be addressed faster.

A value of 1 means that every picture is encoded as a keyframe. Depending on the codec, this will make the files substantially larger.

Quality

Quality of the video (0 ... 100). This value can be entered directly into the input field or adjusted using the slider underneath. The exact effect depends on the codec. The value is a dimension of the quality with which the pictures are encoded. 100 is the best quality, 0 the worst. In general files with higher quality will be larger. Which subjective quality the value 100 is equivalent to depends on the codec. With some codecs, quality 100 is equivalent to the quality of the original material, with others, a distinct reduction of quality is visible even with quality 100.

Datarate

Setting a specified data rate in kBits/second.

Activate the checkbox and enter a corresponding value to change the data rate. Not all codecs support a limitation of the data rate and the exact relevance also depends on the codec.

Audio-Format

Setting the audio codec. Just as with the picture, there are also many different compression methods and formats for the sound. The PCM format is always supported. With this, the data is saved without compression. The additional selection options again depend on which audio codecs are installed on your system.

Please note that some codecs are displayed but do not support all formats. It is also possible that codecs are displayed in the list even though they are not activated for encoding. An error message may be displayed when you try to start generating an AVI file with such a codec. In this case select another format and try again.

If you want to make absolutely sure that you will be able to play back the AVI file, you should stick to the PCM format. More efficient codecs may be frequent, but they are not available on all systems.

Variant

Setting the quality with which a codec encodes the audio data. The exact options available here depend on the selected format. **Lpv Creator** tries to select a variant which comes as close as possible to the original material in the Lpv file. However, you may be able to reduce the file size by accepting a lower quality.

Status

Display of the current frames/second, the elapsed time and the remaining time during the conversion into AVI files.

The status is displayed during the generation of an AVI file. By activating the checkbox "Details" all parameter settings are displayed. However, changes to the parameters are no longer possible at this moment.

Overwrite

Automatic overwriting of an existing AVI file.

Play AVI when done

Playing back the AVI file after completion. The player which is associated with AVI files on your PC will be used for playback.

Save

Starts the generation of the AVI file.

Acknowledgements

Thanks to the Independent JPEG Group

This software is based in part on the work of the Independent JPEG Group.

Thanks to authors of libpng, zlib

This software is based in part on libpng and zlib.

Thanks to authors of libogg and libvorbis

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Release Notes

Version 2022/05/10

The maximum number of visualization channels has been increased from 8 to 16.

Bugfix: The Beam Detection produced incorrect lines in combination with the DisplayZone commands.

Some bugs and security issues within the 3rd-party libraries have been fixed.

Version 2021/04/20

With multi-pass recording, up to 32 channels can now be recorded.

"Sync to NetTimecode" no longer requires a license.

Improved compatibility with Windows 10.

Some bugs and security issues within the 3rd-party libraries have been fixed.

Version 2019/12/16

Some bugs and security issues within the 3rd-party libraries have been fixed.

Version 2016/04/22

"Sync to NetTimecode" now supports Net Timecode with 50fps and 60fps.

Bugfix: When using "Sync to NetTimecode" with 24fps and 30fps the playback position was sometimes inaccurate.

Some bugs and security issues within the 3rd-party libraries have been fixed.

Version 2015/08/28

In connection with the DisplayZone commands output errors could occur.

Bugfix: Under certain circumstances the fog data were created again each time the program was started.

Some bugs and security issues within the 3rd-party libraries have been fixed.

Version 2015/06/01

Minor changes.

Version 2015/05/18

New predefined resolution 1920x1080 has been added to the menu "View".

Version 2015/02/27

Support for the new parameter "Auto Maximize" in the Super Preview Setup.

The quality of the visualization in "LightConverse" has been improved.

Version 2014/11/21

The Lpv Creator can now be used as source for the visualization software "wysiwyg".

Bugfix: The connection to a Lasergraph DSP was refused when the network name of the Lasergraph DSP contained parentheses.

Version 2014/04/08

Minor changes, e.g.:

New menu item "Play" ⇔ "Stop".

New shortcut to exit the program: Ctrl+Q.

Version 2014/03/21

New installer solves compatibility issues with the 64-bit editions of Windows®.

Under certain conditions it could happen that the Visualization dialog did not open.

Version 2013/12/10

The Lpv Creator can now be used as source for the visualization software "Realizzer 3D".

"Sync to NetTimecode" now supports Net Timecode with 24fps, 30fps and 100fps.

Bugfix: Under certain conditions the playback of LPV files with large background images could cause a crash on slow computers.

Redraw issues under CrossOver with "Mac driver" enabled have been solved.

Version 2013/09/27

The quality of the visualization in "Depence V:3D" has been improved.

New predefined resolutions have been added to the menu "View".

Version 2013/09/09

The maximum number of visualization channels has been increased from 4 to 8.
Furthermore individual channels can now be turned off.

The redraw issue within the window frame under Wine has been solved.

Version 2013/02/22

Some Wine related issues have been solved.

The quality of the visualization in "Capture Polar" has been improved.

Version 2012/11/13

The Lpv Creator can now be used as source for the visualization software "Depence V:3D" and "Capture Polar".

Using the new function "Sync to NetTimecode" it is possible to synchronize the playback of an Lpv file to incoming Net-Timecode.

Visualization now works when the Lpv Creator is minimized.

Version 2012/07/13

The Lpv Creator can now be used as source for the visualization software "LightConverse".

Using the new function "Send NetTimecode" it is possible to send the current timecode as Net-Timecode over the network.

Bugfix: The progress bar did not work correctly with very large Lpv files.

Version 2011/11/17

The Lpv Creator now supports different scanner types according to the setting in the Super Preview Setup of the Lasergraph DSP.

Appendix

Shortcuts for Menus

Function	Menu	Shortcut
Open File	File => Open	Ctrl+O
Close	File => Close	Ctrl+W
Close All	File => Close All	Ctrl+Entf
Select DSPs	File => Select DSPs	Ctrl+S
Record Lpv	File => Record Lpv	Alt+R
Convert Lpv	File => Convert Lpv	Alt+C
Write AVI	File => Write AVI	Alt+A
Exit	File => Exit	Ctrl+Q / Alt+F4
Cut	Edit => Cut	Ctrl+X
Copy	Edit => Copy	Ctrl+C
Paste	Edit => Paste	Ctrl+V
Properties	Edit => Properties	P
Reset to File's Properties	Edit => Reset To File's Default	Ctrl+R
Reset to Generic Defaults	Edit => Reset To Generic ...	Ctrl+Alt+R
Always On Top	View => Always On Top	Ctrl+T
Resolution 720x576 (PAL)		Alt+F1
Resolution 720x480 (NTSC)		Alt+Shift+F1
Resolution 320x240	View => 320x240	F2
Resolution 640x480	View => 640x480	F3
Resolution 800x600	View => 800x600	F4
Resolution 1024x768	View => 1024x768	F5
Resolution 1280x800	View => 1280x800	F6
Resolution 1280x1024	View => 1280x1024	F7
Resolution 1440x900	View => 1440x900	F8
Resolution 1600x1200	View => 1600x1200	F9
Resolution 1920x1080	View => 1920x1080	F11
Full Screen	View => Full Screen	Alt+Return
Caption/Frame	View => Caption/Frame	Ctrl+M
Playback Control	View => Playback Control	E
Infos	View => Infos	I
Play / Pause	Play => Play/Pause	Space
Mute	Play => Mute	M
First File		Ctrl+PageUp
Last File		Ctrl+PageDown
Next File	Play => Next File	PageDown
Previous File	Play => Previous File	PageUp
Beginning	Play => Beginning	Home
End	Play => End	End

Forward	Play => Forward	→
Backward	Play => Backward	←
Fast Forward	Play => Fast Forward	Ctrl+→
Fast Backward	Play => Fast Backward	Ctrl+←
Next Frame	Play => Next Frame	Ctrl+Alt+→
Previous Frame	Play => Previous Frame	Ctrl+Alt+←
Manual	Help => Manual	F1

Shortcuts for Properties

Function	Name of Property Parameter	Shortcut
Line Width +	Line Width	L
Line Width -	Line Width	Shift+L
Graphic +	Graphics Intensity	G
Graphic -	Graphics Intensity	Shift+G
Fog +	Fog Intensity	F
Fog -	Fog Intensity	Shift+F

Command Line Parameters

The Lpv Creator can be started from the command line or from a shortcut with the following parameters:

```
LpvCreator.exe [<options>] [<lpv-file> ...]
```

Options:

- f starts the Lpv Creator in full screen mode
- o plays the specified Lpv file once and quits the application when finished
- t opens the program window with high priority (always on top)

Lpv File:

One or more Lpv files can be specified. They will be opened automatically.