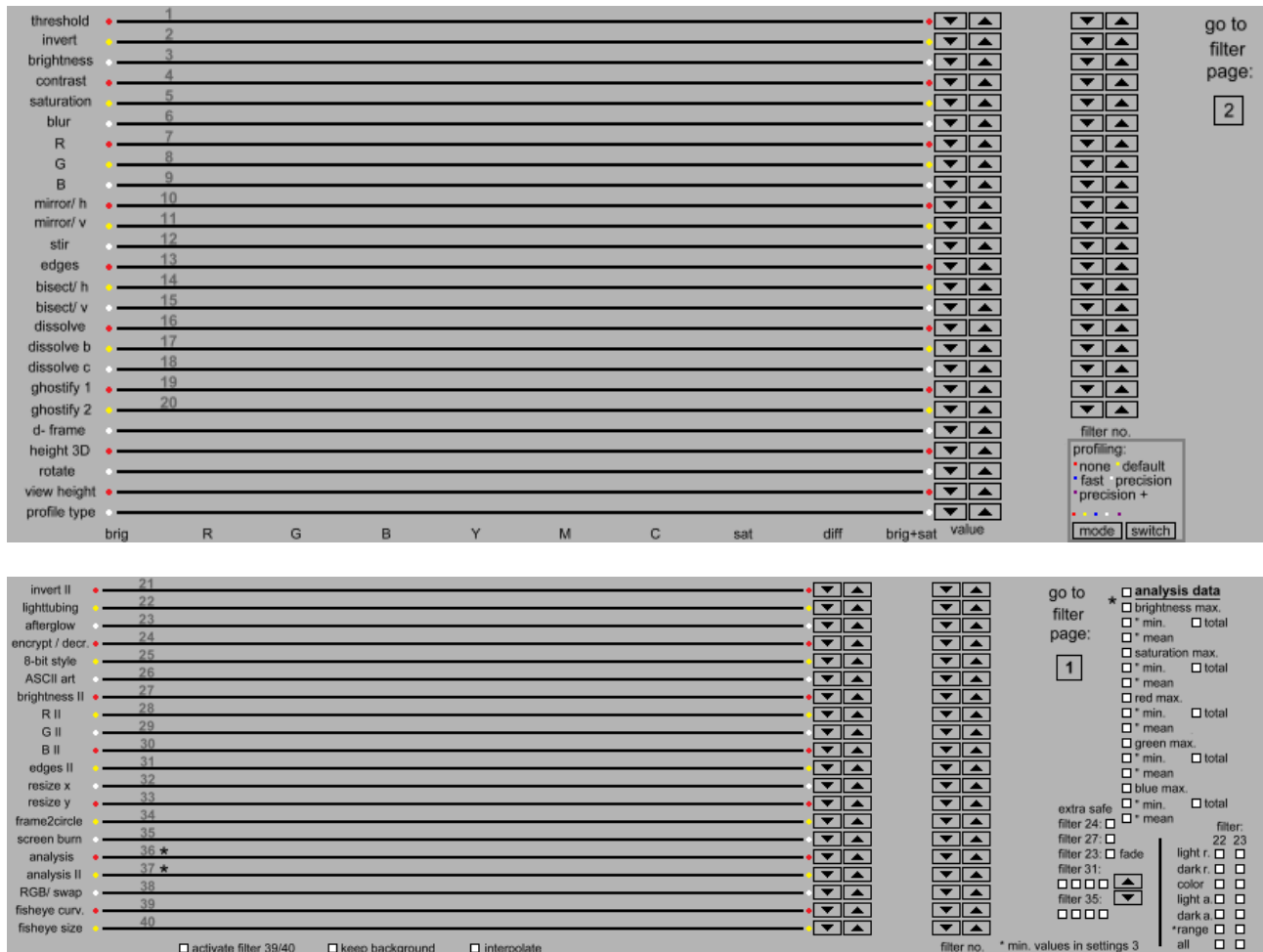# Filters

(for video examples / screenshots go to my website (filters section))

this document gives a brief overview of the filters that come with Centertracker and how they work.

To apply filters to your videos you have to check the box **filters** in the starting screen. After clicking **continue** you will be asked to either open one video or two depending on whether or not you also checked the little box **process two videos.** Latter option applies to filter no. 16 to 20 which can *also* be used with two videos. The following screenshot shows the tow filter pages:

on the right you can see two pairs of up and down buttons. The first pair sets the value of the respective filter, the second pair defines the order in which the filters are applied. If you want to apply for example the filter 'blur' *after* the filter 'stir' you have to change the filter no. from 6 to at least 12. The order in which filters are applied can produce different results! Note that some filters cannot be ordered (resize x, resize y) or are combined (fisheye, here only the curvature (curv.) buttons apply).

on filter page 2 there are three analysis filters of which two are conceived as slider filters (analysis I, analysis II – see further below) and one – the **analysis data** filter - must be checked. All three make use of the list on the right. So to show the respective graphs/ beams check all the boxes you need.

Some filters offer several modes, those can be selected on the right by checking the respective

boxes (identified by their filter number).

So lets start with filter no. 1, **threshold**. What does it do?

the threshold filter reduces the colors being used in the video. The resulting number of colors corresponds to 255/ value ^ 3. Thus, if you set the parameter to 50 the number of colors available colors will be 125 (instead of 16M). If you do not want to let the original brightness of the colors 'shine through' you need to check the box **ignore brightness** in the starting screen.

Filter #2: **invert**

there are seven different invert values. If you set this parameter to 7 it shows the standard invert.

Filter #3: **brightness**

this filter is self-explanatory.

Filter #4: **contrast**

increases/ decreases the contrast of the video.

Filter #5: **saturation**

if you find the colors in your video too pale you can give them a little bit more 'fire' when you apply this filter. You can also reduce the saturation until it appears in grayscale.

Filter #6: **blur**

if there are relics or artefacts in your video (for example due to high compression or old footage) you can smooth it with this filter. The higher the value the more blurred your video get (and the slower processing becomes)

Filter #7,#8,#9: **red, green, blue**

change the tones of the colors

Filter #10, #11: **mirror/ h, mirror/ v**

this will mirror either change left and right (mirror/ h) or up and down (mirror/ v).

Filter #12: **stir**

this filter will a apply a currugated glass-door effect to your video. The size of the glass cells are set with the slider.

Filter #13: **edges**

this filter highlights edges and blanks out the rest. The edges are shown in their actual colors.

Filter #14, #15: **bisect/ h, bisect/ v**

with those filters you can bisect the image either horizontally (bisect/ h) or vertically (bisect/ v).

Filter #16: **dissolve**

this filter can be used to dissolve previous frames of the video into the current frame. The number of the frame to be dissolved is defined by **d-frame** (slider below filter #20); adjust the **frames** slider to make dissolved frames visible. If you have checked **process two videos** in the starting screen the corresponding frame of video 2 will be dissolved (d-frame remain ineffective in that case). If you have checked **pick translucent color** you can pick a color (and its range) of the 2nd video which lets shine through the colors of video 1. The opacity parameter in the **overlay settings** window remains ineffective - its job is adopted by the dissolve filter itself. This 'pick translucent color' option is also available to filter no. 17 to 20. For picking the color you can either use the colors or sliders in the overlay settings or pick it via CTRL & right mouse button in the same window or in the **video** window.

Filter #17: **dissolve b**

dissolves the brightness of a previous frame (or corresponding frame of video 2) into the current frame. With this filter you can create some cool effects (see filter videos on website). If you have checked **subtract** in the starting screen you can dissolve the inverted brightness.

Filter #18: **dissolve c**

dissolves the color of a previous frame (or correspoding frame of video 2) into the current frame.

Filter #19: **ghostify 1**

extracts only the color information of the image. In combination with another video (process two videos) you can create colored ghosts (see filter videos on website).

Filter #20: **ghostify 2**

extracts only the brightness information of the image. In combination with another video you can create bright or dark ghosts (see filter videos on website).

Filter #21: **invert 2**

another set of 7 invert modes

Filter #22: **lighttubing**

this filter allows to create so-called light-paintings or light tubes. Although it says 'light' you can also do the same with dark or colored areas of the video frame. The chosen mode "stores" the respective criteria all along the video. For example if you have chosen light, r. (r. = relative) or light, a. (a = absolute) all areas which are brighter than the background will "freeze" so that a moving light will gradually paint a path along which it moves. For the absolute modes you can use the *vertical slider* on the right to set the absolute value which the respective mode refers to.

Note that this slider applies to both filter 22 and filter 23. So it's advisable to use only one of these

filters at a time. Also note that the preview window does only correspond to the output video if you start at frame 0 and always step one frame forward. If you jump between frames the preview will differ from the output.

Filter #23: **afterglow (aka fading)**

similar to filter 22 you can use this filter to store image data (be it light, dark, colored etc.). However, the data will only be stored for the chosen number of frames (up to 100) and if the **fade** box is activated the data fades the older it gets. Be careful to use values higher than 10 as that can drastically reduce processing speed but more importantly you shouldn't seek to a frame number > 10 in that case because it may take ages for the computer to display the preview. Experiment with the values to see how far you actually want to go ("back in time"). The fading effects can be quite stunning.

Filter #24: **encrypt / decrypt**

this filter offers 3 (+1) levels of video (visual) encryption. The higher the level the more distorted the video image becomes. You can then share your encrypted video publicly without anyone being able to make head or tail of it unless he has the correct combination of values to decrypt the video. As an example: for a video with the dimensions 720 x 576 pixels there are 122680319758319203909632000000 possible combinations.

For a level 3 encryption you have to adjust 10 separate sliders in the desired way (encryption of the image is live-previewed while adjusting). You can save those values to the file "*pass.bin*" - which will be located in the directory of your video file - by clicking on **save values** and later load them again for decryption. This relieves you of noting them. If you want to share the encrypted video with other people they also need to purchase Centertracker deluxe (a free decryption tool may be available in the future) plus they will of course need the set of values for being able to decrypt the video. For that purpose you could simply mail them a link to your encrypted video and the set of values or the file *pass.bin*. To decrypt the video they have to save/ download it to disk. Then, in Centertracker, they have to set the filter slider to 4 and then load the file *pass.bin* (clicking on **load values**) or adjust the sliders manually. Finally the decrypted video has to be saved and can then be watched.

As a safety precaution you can further distort the image by checking the "extra safe" box (on the right of filter page 2 where it says **filter 24:**). That box also has to be checked when decrypting.

Yet an additional safety option is **security+** which you can check in the **cryptography** window. Use it in combination with the button **generate** in the same window. The generate button lets you choose an image file (bmp or jpg) which will be used to further encrypt the video image. To decrypt you have to set the filter slider to 4. Then you check security+ and the **load values** button (note: for *de*cryption don't click the generate button!). If you had chosen **extra safe** when encrypting the video you have to check that box now, too. The image will then be decrypted. Note: the security+ mode should only be used if you save the encrypted video *without compression*. This will result in a large video file but prevent artifacts which will appear otherwise when you decrypt if you have saved with compression.

as with any encryption technique there is no absolute guarantee that in theory someone could find the correct set of values and the encryption algorithm itself. So if your video data is ultra top secret you should really only hand it out personally.

IMPORTANT: width and height of source must be divisible by 2 and do not use this filter with any

frame resizing filter. Otherwise the program may crash!

Filter #25: **8-bit style**

this filter turns your video into a C64 graphics video with 16 colors and block pixels. Two modes are available: mode 1 allows any of the 16 colors for each pixel. Mode 2 considers the fact that the Commodore 64 could only display 2 different colors for each 8x8 pixel block at the given resolution. Usually the difference is rather small and therefore you should use mode 1 to avoid "blocky" areas.

Filter #26: **ASCII art**

turn your video into letters or blocks, either black & white or colored. The letter modes (3 and 4) use 27 characters of the Commodore 64 charset.

Filter #27: **brightness II**

the brightness II filter uses different algorithms to brighten/ darken your video. While brightness I does not consider contrast, this filter includes it and hence dark areas with slightly different color tones will become more differentiated. Mode 2 brightens dark areas more than light areas. This can produce some nice optical effects.

Filter #28-#30: **RII, GII, BII**

another set of R,G,B filters that uses the brightness II algorithms.

Filter #31: **edges II**

while edges I produces colored edges this filter creates black or white edges and it is also possible to include the background.

Filter #32/ #33: **resize x, y**

to the right of the filter sliders you see two values. They are calculated as (width / 2) - 10 resp. (height / 2) - 10. For example a video with the dimensions 720 x 576 shows the values 350 and 278. You can only resize to dimensions that are divisible by 2. Contrariwise the displayed values have to be converted to the actual dimensions which you do by calculating:

resize x (width) = (displayed value * 2) + 20
resize y (height) = (displayed value * 2) + 20

For example the setting resize x = 990, resize y = 490 produces a video of the size 2000 x 1000 pixels.

Further to the right you can see another pair of values. Those are value suggestions to keep the aspect ratio: if you adjust one slider the value of the other one will also change and you should use this value if you want to keep the aspect ratio. In order to save a video with dimensions bigger than your current screen resolution you should use method 2 to save the AVI. Otherwise the program may crash. Furthermore you have to consider that with big values enormous RAM (memory) resources may be used, e.g. if you choose the max. values 3000, which slows down your system.

Filter #34: **frame2circle**

converts the video frame into a circle which can produce funny optical effects, e.g. with faces

Filter #35: **screen burn**

freezes pixels which brightness or any of the three color channels (R,G,B) (mode 1: brightness, mode 2-4: R,G,B) are above the chosen value (adjust filter slider).

Filter #36: **analysis I**

shows graphs *on* the video frame that contain information about each line (setting 1) or each column (setting 2) of the video frame. On the right of the filter page (below **analysis data**) you can choose the information you want to display.

Filter #37: **analysis II**

turns the video into a diagram screen: choose the graphic properties you want to display on the right (below **analysis data**). The first row displays *frame*-wide and *video*-wide (last 5 bars) graphical information, row 2 & 3 show line data resp. column data (as in analysis I).

Filter #38: **RGB/ swap**

setting 1-3: turns frame into mere R,G,B tones (swaps them with setting 2 and 3). Settings 4-8: swap the color channels.

Filter #39/ #40: **fisheye curv./ size**

highly adjustable fisheye effect: change the curvature of the lense with slider 39 and its size with slider 40. Activate the fisheye filter by checking the respective box at the bottom of filter page 2. You can also tick **keep background** and/ or **interpolate** the fisheye to reduce blockyness of the pixels.

Filter # additional: **analysis data**

by checking the box **analysis data** on the right of filter page 2 and choosing the graphic properties you want to display Centertracker extends the frame by a horizontal bar chart. If you check the **total** boxex *video*-wide graphical properties are displayed.

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most of the filters (except for the size-changing filters) can be applied to certain frames only, by using the **frame slider**, the **[** and **]** buttons, the buttons **leave** / **apply** and the **filter no. slider** in the frames window. With the frame slider you jump to the desired frame. With the [and] buttons you choose the chunk of the video you either want to apply or not to apply (leave) the selected filter to.

In addition you can cut whole chunks out of the video with the **[** and **]** buttons and the **cut** / **uncut** buttons. If a chunk is cut a *pink line* will appear on the frame slider line that indicates the cut passage and the frames in those passages will be displayed with a *red cross* in the preview window.

note that a cut video will only be saved with audio if the video source is AVI and the sound stream

is of constant bit rate type (CBR). You can also use the **choose audio file** option in the *starting screen* to choose the audio from a different AVI file. This for example is useful if you want to use the audio of video source 2 when working with the dissolve filters.

Finally we have the settings 2 window. Here you can specify the areas in the frame to which the respective filters are to be applied. By this you can also visualize several filters at a time.
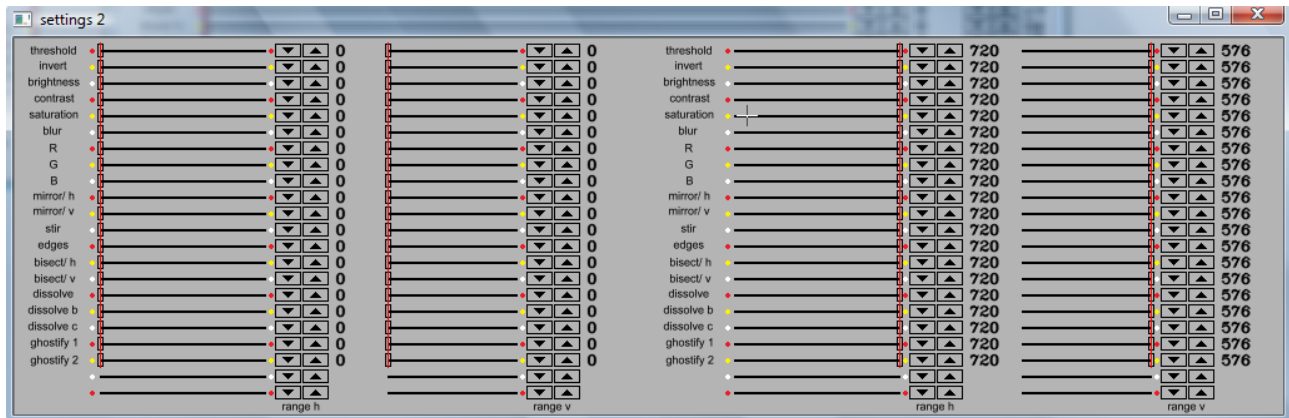
simply adjust the sliders to the desired x and y coordinates and watch the preview window for the result. The first and third colomns define the left and right borders of the filter area, the 2nd and last colums set the top and bottom borders.