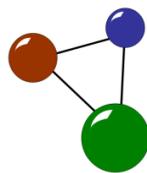# Saving corrupted video files with Video Repair Tool

User manual for the versions
VRT and VRT5

Version 1, updated in: 09/2019

Imprint and contact

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Table of contents

1. About this user manual

Please read this user manual thoroughly before you install and apply our software. Video Repair Tool (short: VRT) is a repair software used with a number of video file formats. It heps to make corrupted, truncated or lagging videos run again. Video Repair Tool does not recover any lost or deleted files and exclusively repairs video fles which are still available on your harddisk or memory card.

When you read this manual, please consider the following graphical markers:

⚠️	Safety instructions which are placed in relevant chapters of the user manual
❯	Tip for a successful and easy use oft he software
Ctrl	Bold and cursive font style in the context of commands, buttons and input fields within the software

The user manual addresses all user groups who want to repair their video files easily and quickly. Users can be either more or less experienced with video repair software and file structures if they want to apply VRT or VRT5. In order to apply any software version of VRT, users must be familiar with the basic functions of their computer and its file system (e.g. Windows, Mac).

Contents and target groups of the user manual

Chapter 2 informs you about possible fields of application and user scenarios, the software's properties and limitations. The chapter also presents the differences between the software versions VRT and VRT5. Chapter 3 presents commonly used menu tags and general options which are integrated in the programme. In chapter 0, especially users who are not familiar yet with file saving and their Windows or Mac file system are provided with an installation guide, starting with the software download. The installation guide presents all requirements, software messages and processes during download and installation step by step.

Chapter 5 leads you through the process of repairing damaged video files via step-by-step instructions. Chapter 6 provides you with typical and common errors and solutions, listed in a chart. In chapter 7, you get an overview on camera models which are compatible with VRT and which have already been successfully tested with the programm. The list only represents a selection of possible camera models as VRT is compatible with most digital video recording devices. The chapter also includes information on specific programme options which help you solve device-specific problems. Chapter 8 contains an alphabetical index so you can easily find your topics

by looking for relevant keywords. In chapter 9, you are provided with a glossary containing specific IT and video terminology.

2. Video file repair with VRT

Video Repair Tool was designed to repair video files in all common file formats. There are many reasons why video files can get damaged. Not being able to play or view videos causes a number of negative consequences, both in a private and business setting. For example, you may not be able to watch your wedding videos anymore or lose potential customers if your company's image video does not play. Whatever file is concerned, video files can get corrupted in many ways. The most common error sources are listed below.

- truncated video files: videos suddenly stop at a certain point
- broken video files: files are damaged to an extent that makes a replay impossible
- corrupt and damaged video files: videos are not completely broken, but "stutter" and only play in a bad quality
- video files which do not play in Quick Time or in the Windows Media Player
- video files which were not finalized by a digital camera

Video Repair Tool helps you to make videos on your computer, smartphone or digital camera run again. The software is compatible with a number of common video file formats and proprietary file formats produced by different camera types. It functions in two ways as presented below.

- fully automatic reconstruction of raw video and audio stream data
- support of non-broken reference movies for finding missing movie meta-data and parameters
- video file repair based on a reference movie's internal file structure

2.1 How VRT works: technical details

The functionality "behind the user interface" of VRT is mainly based on three basic aspects which most video cameras on whatever device have in common: encoding, container files and codecs.
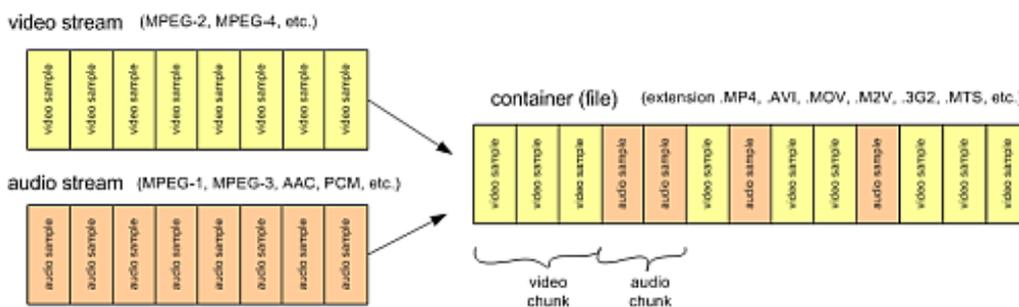
Functional aspects "beyond the user interface"

- **Encoding:** This principle includes video encoding and audio encoding. When a video camera records a movie, the audio and video stream data of the movie is encoded in a certain format. Typical video encodings are MPEG-2, MPEG-4, Apple Intermediate, typical audio encodings are MPEG-1, MPEG-3, AAC and PCM.

- **Container files:** Both video and audio stream data is stored in interleaved chunks to the movie file, and the data in the file alternates between video and audio all the time. Because the movie file contains both video and audio chunks, it is called a container. Typical container formats are QuickTime MOV or Microsoft AVI.
- **Codec:** A codec is an algorithm (in the player software) that can decode/encode a certain video or audio format. Common codecs used in QuickTime files (.mov/.mp4) are Apple Intermediate Codec ("icod"), MPEG-4 ("mp4v"), MPEG-4 AVC ("avc1"), MPEG-4 AAC ("mp4a") and MPEG-2 ("xdvc"), for PCM also Big Endian ("twos") and Little Endian ("sowt").

Screen 1:   Composition and structure of a container file

The functionality of Video Repair Tool is further based on two chronological processes. First, the overall problem with video repair is finding the video and audio chunks in damaged and corrupt movie files. Video Repair Tool scans the movie (e.g. a .MP4 file) for video and audio chunks, tries to guess if a chunk is video or audio and so extracts all video and audio chunks for a new repaired movie. This tool doesn't depend on any valid or correct container format – it fully automatically can extract the video and audio streams without a valid container.

Afterwards, the tool saves the chunks (audio and video streams) to a new movie file, and so adds a new QuickTime container to them. In consequence, the video (and the audio) can be played back again. If there was any raw video or audio data in the file, it can be stored into a new playable movie file.

2.2   Available software versions

Video Repair Tool is available in two versions with free demo versions for you to "try before buy". VRT is a full version and was designed to repair an unlimited number of video files. VRT5 is the "smaller" alternative for users who want to use the software for a few video files only. VRT5 disposes of the same functional properties as VRT, but only repairs up to five video files. VRT is compatible with the following file formats:

- .avc1 (H264/AVC, used by most digital cameras, HD video cameras, iPhone, etc.)
- .mp4v (H264/ISO, used by a few cameras)
- .MPG2 / xdvc / xd5d / xd5e (MPEG-2 / XDCAM, used by Sony cameras)
- jpg (Motion JPEG,used by Panasonic cameras)
- icod (Apple Intermediate Codec, used by Final Cut)
- dvc / dvpp / dvhp (DVCPRO / DVCPRO HD, used by Panasonic cameras)
- apch / apcn / apcs / apco / ap4h (ProRes 4444/422/LT/HQ/Proxy, used by Final Cut)

Please note: As usual with commercial software products, there is no guarantee that the software repairs all video files correctly. Depending on the source and degree of file damage, VRT might not completely repair extremely corrupted or broken files.VRT only repairs files which are accessible on your computer or camera, it does not recover lost or deleted video files. If you need to recover lost or deleted files, you can download, test and use the data recovery programme MaxDataGenius which is also available at www.grauonline.de.

3. Menu tabs and general programme options

3.1 The menu bar in VRT

The menu in VRT has been tailored to easy use because the programme was designed according to a wizard principle. This means that all relevant background processes are summed up in a clear graphic user interface (GUI). In the following chart, you will find explained all interactive menu tabs. You can activate them by click.

Tab name	What does the software do?
Repair	⮑ VRT repairs your corrupted, truncated or otherwise damaged video file.
	⮑ By clicking on **Choose movie** and **Choose reference movie**, you can select all relevant files for your video repair process.
	⮑ The software displays repaired movie clips during and after the process.
	⮑ In the dialogue, you can select an output folder, preview your repaired movie, stop the replay and open a detailed repair report.
Batch repairs	⮑ The software chronologically repairs several corrupted, truncated or otherwise damaged video file in an automatical order.
	⮑ It is not necessary to manually initiate every single file repair.
	⮑ Batch repairs only function if all concerned files are located on the same source medium (camera, smartphone, iPad …).
Options	⮑ By activating or deselecting the options in the list, you can influence the programme's functionality and solve specific problems during video repair.
	⮑ The individual options are named and explained in chapter 3.2.

Purchase	⮑ You can get an activation code via **Purchase activaction code**.
	⮑ If you received an activation code, you can enter it into the input field in order to activate your software product and click on **Activate**.
	⮑ Depending on the version you purchased, entering an activation code activates either VRT or VRT5.
Exit	⮑ Clicking on **Exit** finishes the VRT session and closes the software dialogue.

3.2   General options in VRT

VRT disposes about a number of general programme options for you to choose from. The options are divided in three sectors: **Stage 1 - Repair**, **Stage 2 – Reencode (optional)** and **Other**. If The following chart highlights what these options can do for your video repair process and when it is recommended to activate them. If no other activation method is listed below, you can activate or deselect the options via checkboxes.

Option name	What happens after activation or input?
Start scan at position in file (percent), with input field	⮑ If this option is activated, the scan and repair process start at a point you can select.
	⮑ The activation makes sense if you have a very big video file which you can only repair in several sections.
Stop scan at position in file (percent), with input field	⮑ If this option is activated, the scan and repair process stops at a point you can select.
	⮑ The activation makes sense if you have a very big video file which you can only repair in several sections.
Frames per second (FPS), with dropdown list	⮑ If you select **auto**, the software automatically uses video frames from the reference file.

	➲ If you enter a number (e.g. 29.97), the software overwrites the concerned video frame.
Custom repair parameters, with dropdown list	➲ You can choose between **qtrc** and **single**.
	➲ If you select **qtrc**, the software tries to repair based on found QT container table fragments.
	➲ If you select **single**, the software tries to repair special H264 camera recording footprints (e.g. Samsung).
Enable entropy scan (optional)	➲ During an entropy scan, the software detects the degree of data compression within a video file's sections and frames.
	➲ Below a limit of 0.6 (compression value), there is probably no video data available within a section or frame.
	➲ With a compression value lower than 0.6, further repair processes will fail.
Detect new movie clips	➲ For each "mdat" atom found during the repair process, the software starts a new file
Enable AVC1 single mode (required for Nikon, Samsung, iPhone, other)	➲ After activating this option, the software applies an easier scanning method concerning video frames.
	➲ Activating the option can make the repair process more efficient with some cameras.
Enable strict frame number checking (better result if frame chain complete/not broken)	➲ The software enforces a stricter chonology while repairing video frames
	➲ If the chain is complete and not broken, activating the option can lead to a better result for strongly corrupted files.
No CTTS repair (fixes playback stop/hang issues)	➲ The video file is repaired without a fixed chronology of frames.
	➲ A repair without a frame

	chronology is recommended if the concerned file is corrupted to a great extent.
Enable logging	➲ If this option is activated, the software creates log files of video repair processes.
Overwrite existing codec information by reference file	➲ If this option is activated, the software will always overwrite any found codec information of the input file by codec information of the reference file.
	➲ The activation is only recommended if you know that your input file has wrong codec information.
Enable PCM detection	➲ The software enforces the detection of audio PCM samples.
	➲ The activation is only recommended if you definitely need PCM codec samples.
Enable AAC detection	➲ The software enforces the detection of AAC samples.
	➲ The activation is only recommended if you definitely need AAC codec samples.
Save raw video+audio streams to files	➲ If you enable this option, the software saves raw video and audio data to files.
	➲ You need special video and audio editing programs to import those data and to merge audio and video streams manually.
Delete existing files in output folder	➲ If you activate this option, repaired videos in the output folder are deleted.
Cut samples, with dropdown list	➲ This is a function for video experts.
	➲ If this option is activated, you can define the number of samples which shall be ignored during PCM audio detection.
	➲ It is recommended to activate the option if "click sounds" during

	PCM audio repair occurs.
Reencode repaired movie files (fixes encoding/import errors)	⮐ If this option is activated, the software reencodes repaired movie files by some encoder programme (ffmpeg or mencode).
Preset for reencoding, with dropdown list	⮐ If this option is activated, you can adapt some reencoding presets for your video repair processes
	⮐ Activating this option can slightly improve your repair results.
Custom reencoder params, with dropdown list	⮐ This is an option for video file experts.
	⮐ With custom reencoder params, you can individually adapt the reencoding setting for your repaired video files.
App for preview, with dropdown list	⮐ With this option you can choose between several common replay programmes for your preview.
Change output folder, with button	⮐ By activating this option, you can select an alternative output folder for your repaired videos.
	⮐ The standard output folder is named **repaired**.
Create truncated movie, with button	⮐ This is an option for video file experts.
	⮐ The software creates a truncated movie with a maximum file size of 2 MB.
	⮐ This option is helpful if the output file must fit on a smaller medium than the source medium.

4. Preparing VRT for use

Downloading and installing VRT and VRT5 is easy with the setup wizard. Nonetheless, You will only get idea results in video file repair with VRT if you download, unpack and install the software correctly.The following instructions lead you through the process..

4.1 Downloading the software

1. Open the website www.grauonline.de in your browser.

2. Below the tab **Solutions**, which you find within the context menu, select the entry **Video Repair**.

3. On the product information page, navigate to the download buttons.

Download

System requirements:
Mac: OS X 10.6 or higher (requires Intel-based Mac, PowerPC not supported!)
PC: Windows Vista / 7 / 8 / 10 or higher
Supported camera formats: See above
DEMO version restriction: The repaired files are only half the size of the repaired movie files in full-mode! (e.g. if the DEMO version repairs 50 MB, the full version will repair 100 MB)

⬇ Download "Video Repair Tool (Mac & Windows) – By clicking this download link, you are accepting the license below!"
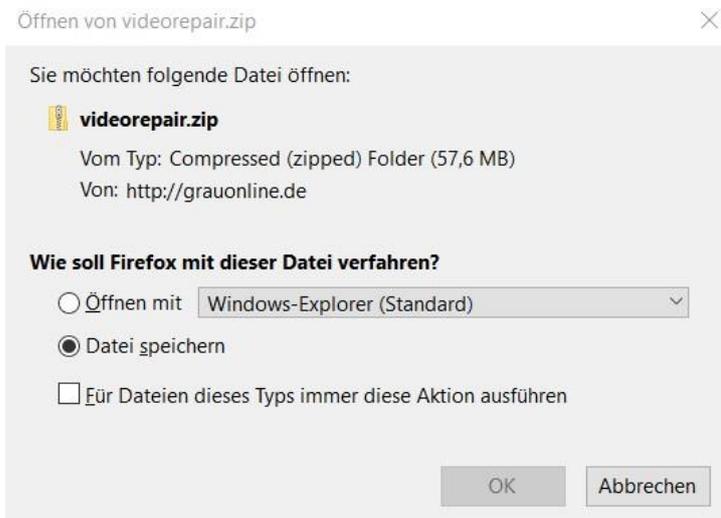videorepair.zip – 58 MB

NOTE: For a successfull repair, always study the camera specific options listed in above table!

Screen 2: Download buttons for Video Repair Tool

4. Click on the download button in order to start the software download.

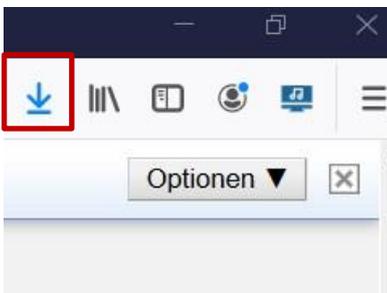   o The software opens a download dialogue. Select **Save file** and proceed by clicking on **OK**.
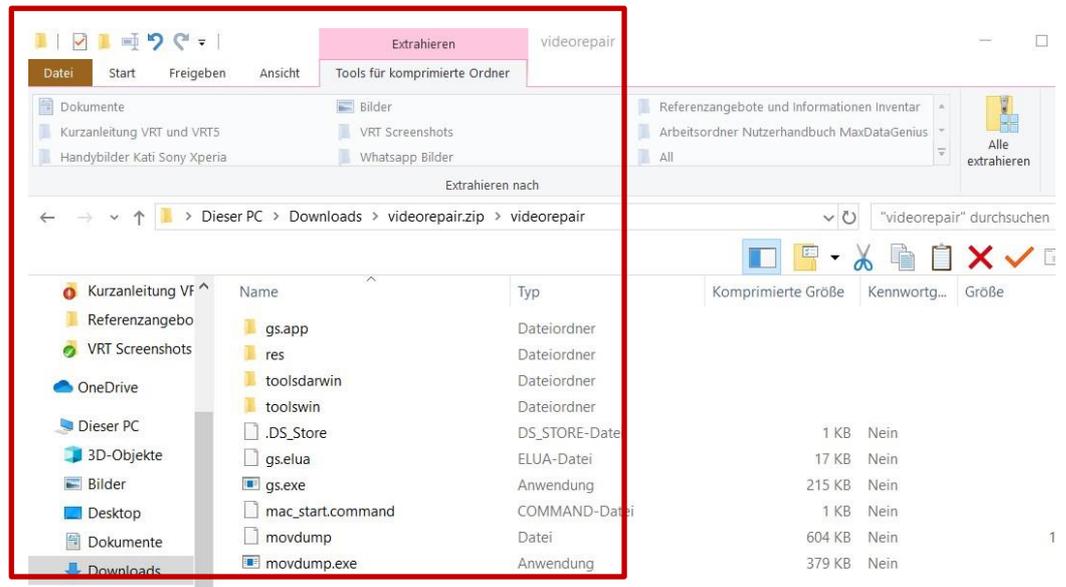
Screen 3:   Starting the download of VRT

> o   The blue progress bar below the download symbol in your browser informs you about the download status.

Screen 4:   Download symbol in your browser

5.   Click on the download display to open your download file.

Screen 5:   .zip file in the download folder

> ✓ The setup wizard for Video Repair Tool shows as a zip file in a new dialogue window. You can now unpack the setup wizard and execute the setup.

4.2   Unpacking and installing the software

1. If you work on a Windows computer, extract the .zip file by right-clicking on it in the Windows Explorer and selecting ***Extract all***.

   o As a Mac user, you can extract the .zip file by double-clicking on the file in the Mac Finder and navigating to the extracted folder.

2. In the following dialogue, select a destination folder and click on ***Extract*** (Windows).

   o The operating system now unpacks the downloaded .zip file.

   > ✓ The setup wizard has been unpacked and is available for the installation process.

3. Open the unpacked folder and double-click on the file "gs.exe" in order to run the software setup (Windows).

   o On some systems, ´the file name is just "gs".

o   As a Mac user, you must double-click on the file "gs.app" instead. On some systems, the file name is just "gs".

gs.app	Dateiordner				
res	Dateiordner				
toolsdarwin	Dateiordner				
toolswin	Dateiordner				
.DS_Store	DS_STORE-Datei	1 KB	Nein	7 KB	
gs.elua	ELUA-Datei	17 KB	Nein	66 KB	
gs.exe	Anwendung	215 KB	Nein	462 KB	
mac_start.command	COMMAND-Datei	1 KB	Nein	1 KB	
movdump	Datei	604 KB	Nein	1.201 KB	
movdump.exe	Anwendung	379 KB	Nein	709 KB	

Screen 6:   Activating the setup wizard in the unpacked download folder

4. Select a language for the setup, then click on **OK**.

Choose language

Please choose your language:

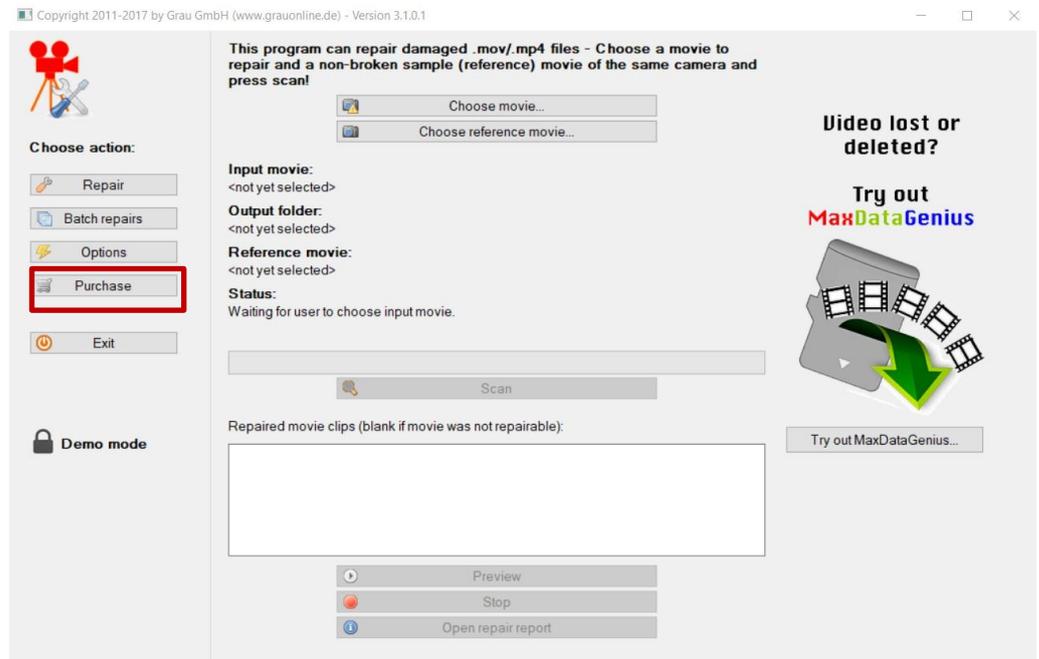**English (default)**
Chinese 中文

OK

Screen 7:   Language selection during setup

5. If you downloaded a demo version, the software notifies you that only 50 percent of your video files will be repaired. If you want to repair your complete files, you must click on the **Purchase** button on the following start screen to receive an activation code.

o   The software shows its start screen.

Screen 8:   Start screen after installation

✓   The installation process has been completed. You can immediately start repairing your videos.

> ➤ **Tips:**
>
> ➲ You can choose between VRT and VRT5 while purchasing and activating a full version. The version is not relevant for the demo.
>
> ➲ Always try VRT with a test file, so you can make sure it is tailored to your purpose.

5. Repairing video files with VRT

Caution

File loss or file damaged caused by caused by software execution on the source medium

Loss or damage of video files can occur if you run Video Repair Tool (VRT) on the medium where the concerned files are located.

- ⮑ Never run Video Repair Tool on the camera or computer which contains the files you want to repair.
- ⮑ Always execute Video Repair Tool on an external computer or disk.
- ⮑ If required, use tools like a USB adapter in order to connect the medium concerned with an external computer.
- ⮑ Create backup copies of your files before starting the repair process in order to prevent file loss or damage.

As presented in the chapters 2, 2.1 and 3.1, VRT was designed and developed to repair video files which are located on digital cameras and available in different file formats. Generally, there are two methods of video file repair.

Two main repair modes

- ▪ **Single video repair via *Repair*:** recommended if you have a small number of corrupted files which you want to repair
- ▪ **Repair of several files on the same camera via *Batch repairs*:** recommended if you have many corrupted video files on the same camera and do not want to start a new repair process each time; mainly used by data and IT professionals

In the following chapters, you get to know both repair methods depending on your repair case. Before you start any video repair process, it is recommended to optimize the repair results by adapting the options (see chapter 3.2) according to your camera model (see chapter 7).
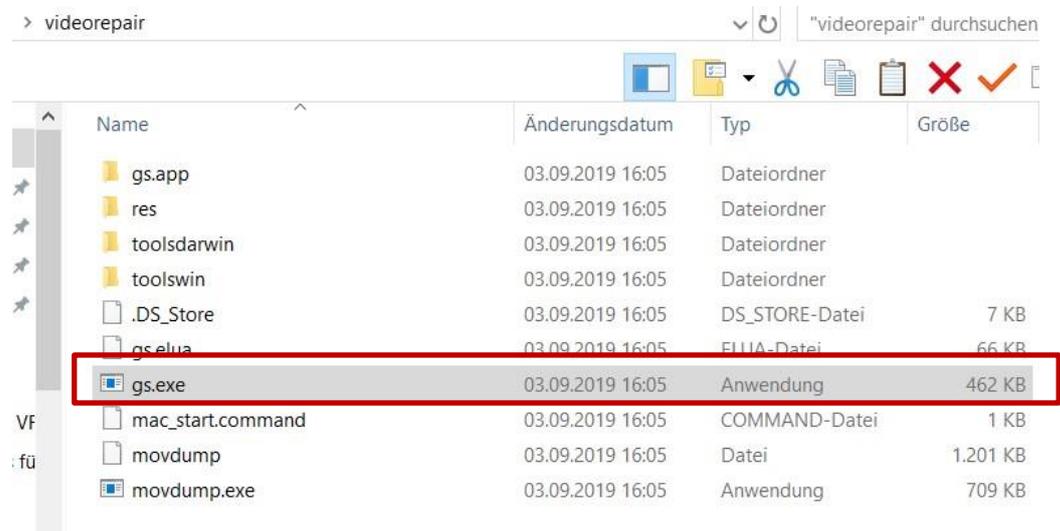
5.1 Repairing individual video files

The most common operation to conduct with VRT and VRT5 is the single repair of corrupted, truncated or damaged video files. If you are going to repair individual files, the following instructions will lead you through the process.

Repair mode for single video files

1. Start VRT by double-clicking on *gs.exe* in your programme folder.

   o Depending on your file system, the file name can slightly differ as presented in chapter 0.o⍰.
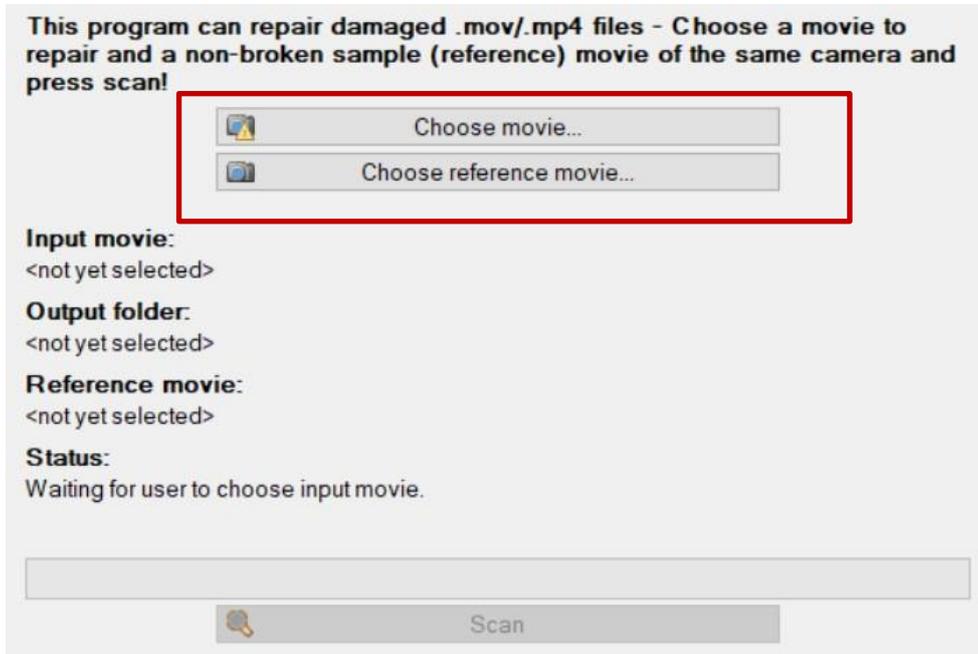

Screen 9: Starting VRT – programme folder

2. Select your language in the following dialogue window and click on *OK*.

   o The software shows a start screen.

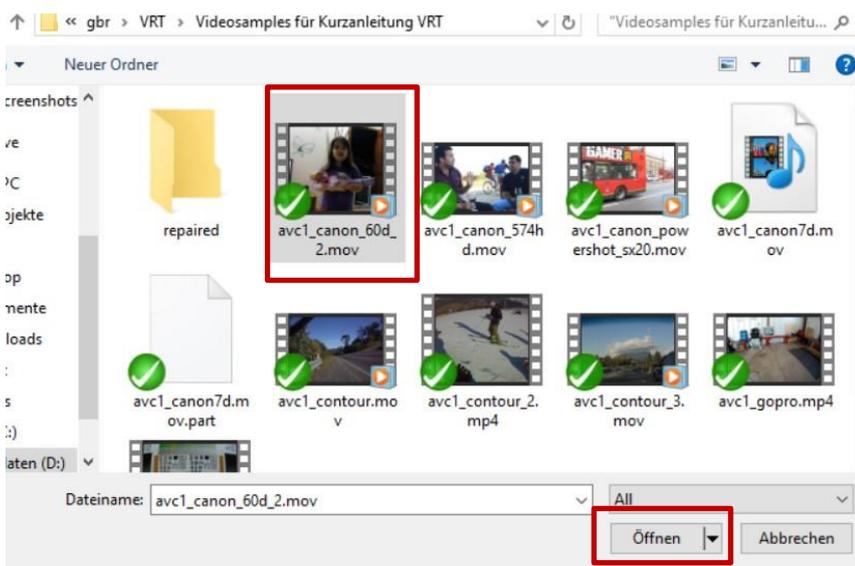3. Click on *Choose movie* in order to find and select the damaged video file which you want to repair.

This program can repair damaged .mov/.mp4 files - Choose a movie to
repair and a non-broken sample (reference) movie of the same camera and
press scan!

Choose movie...

Choose reference movie...

Input movie:
<not yet selected>

Output folder:
<not yet selected>

Reference movie:
<not yet selected>

Status:
Waiting for user to choose input movie.

Scan

Screen 10: Selecting a broken or damaged movie

o   The software opens a dialogue in which you can browse your
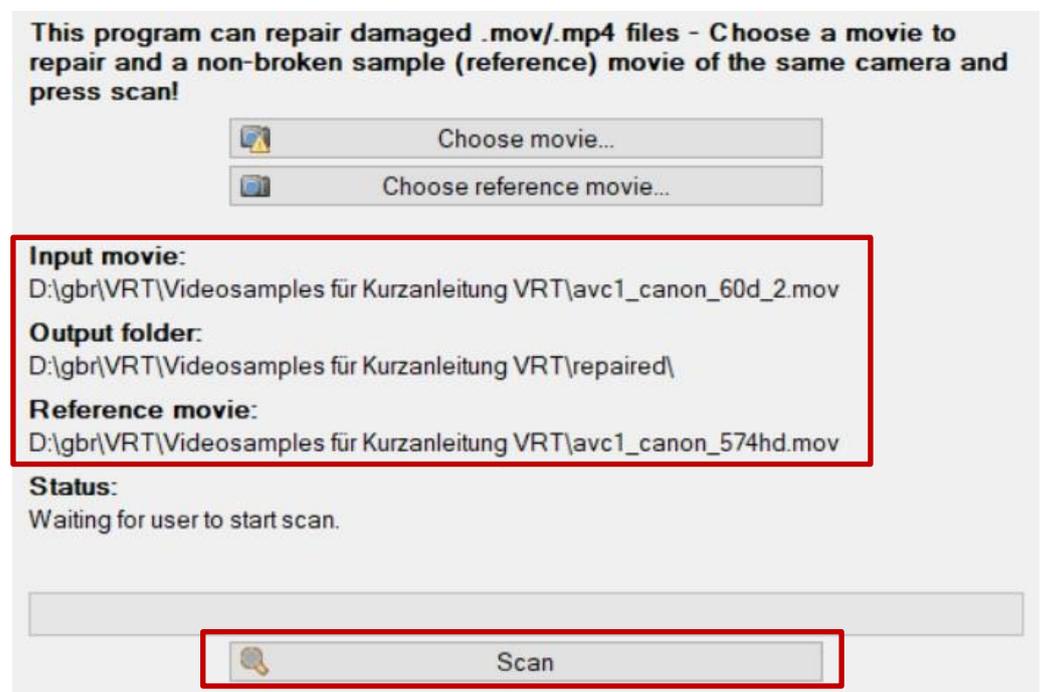computer's or camera's folder structure.

4.   Navigate to the video file which you are going to repair and open it.

Screen 11: Finding and opening a damaged movie files on a camera or computer

         o   The software automatically returns to the repair dialogue so you can proceed.

5.   Click on ***Choose reference movie*** in order to find and select an intact video file taken with the same or a similar camera.

6.   Navigate to the video file which you are going to take as a reference movie and open it.

         o   The software has adapted the displayed user information.

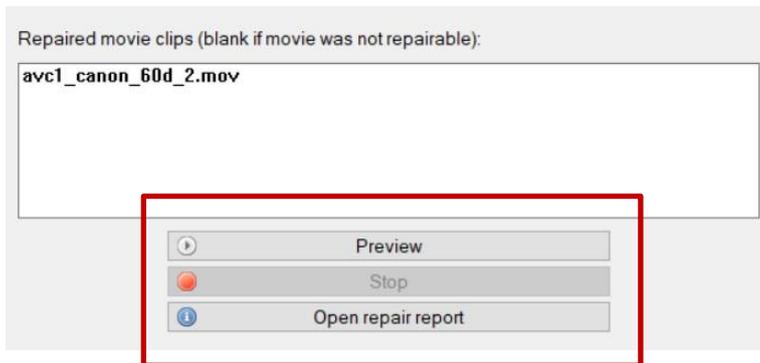7.   Click on Scan in order to start the repair process.

Screen 12: Displayed user information after the selection of movie files

         o   The software analyzes both movie files. It repairs the input movie by applying and reproducing the structure of the reference movie.

         o   As soon as the software has repaired the input movie, it adds the repaired file's name to the file list.

8.   Click on ***Preview*** to verify your repair results within the programme.
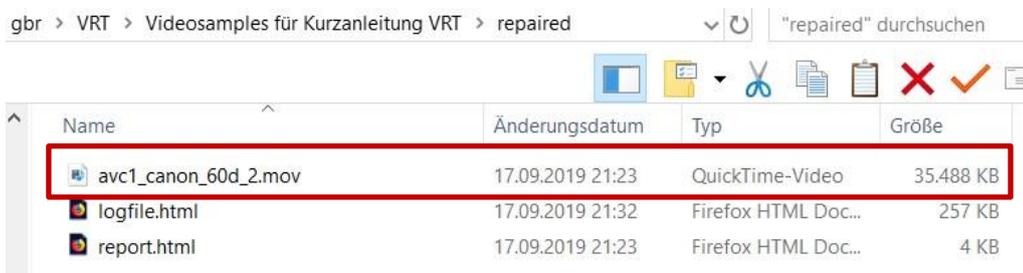
Screen 13: Repaired movie clips in a list view

- o The software opens the repaired video file in its internal player.

9. Additionally, click on **Open repair report** if you want to view detailed information on the repair process.

- o The software then automatically saves a short report and a detailed logfile in your output folder. If you did not change the output folder, its standard folder name is **repaired** and it is located in the same folder as the damaged video file.

Screen 14: Repaired movie clips in the output folder

10. Verify the result of the video repair process in the output folder with your usual video player.

11. If you are not satisfied with the result, repeat the instructions 1 to 10 and adapt the programme options according to your camera type.

- ✓ Your corrupted, truncated or damaged video file has been repaired and plays again.
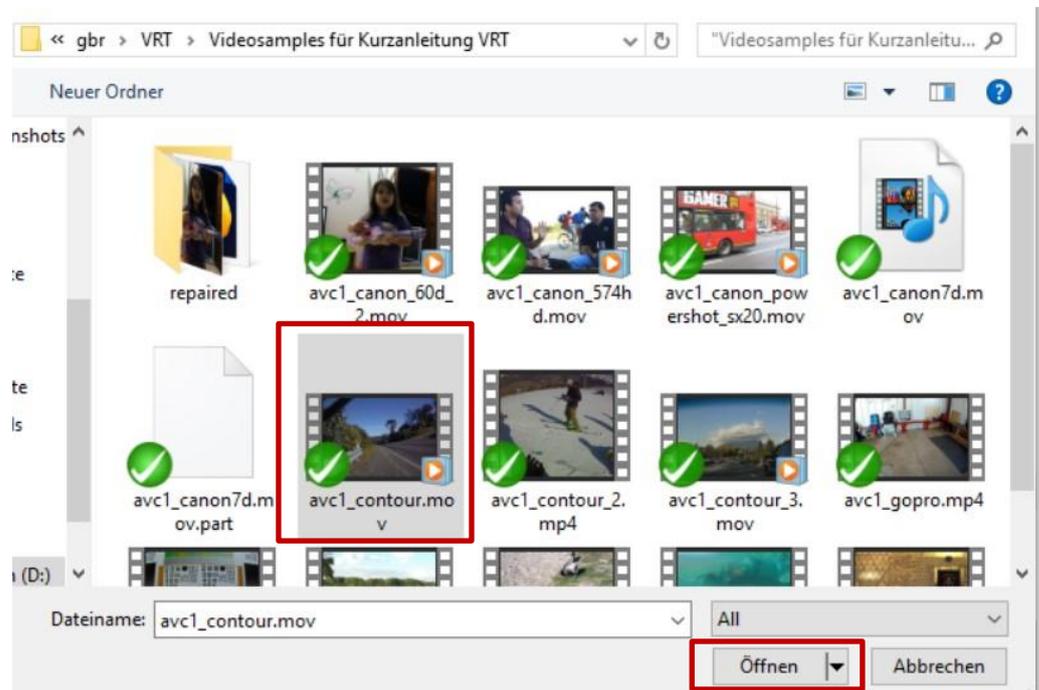
5.2 Repairing several video files via batch repairs

Chronological repair of several videos

Apart from the simple repair mode presented before it is also possible to repair several video files on the same camera while using only one reference file. The video files are then repaired in an automatical queue (also called a "batch") in a chronological order. Follow the instructions in this chapter to conduct batch repairs.

1. Start VRT by double-clicking on *gs.exe* in your programme folder.

    o   Depending on your file system, the file name can slightly differ as presented in chapter 0.o..

2. Select your language in the following dialogue window and click on *OK*.

    o   The software shows a start screen.

3. Click on *Choose reference movie* in order to select an intact reference file first.

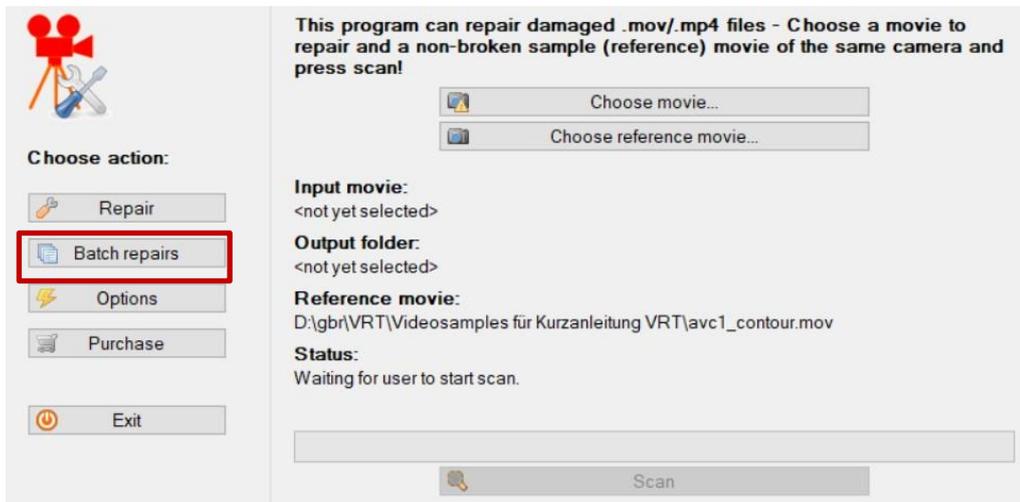4. Navigate to your reference movie file as presented in chapter 5.1 and open it.

Screen 15: Selection of a a reference movie for batch repair

5. Click on Batch repairs in the menu bar on the left.

Screen 16: Selection of the batch repair mode

- The software opens a new dialogue in which you can add and remove several corrupted video files.
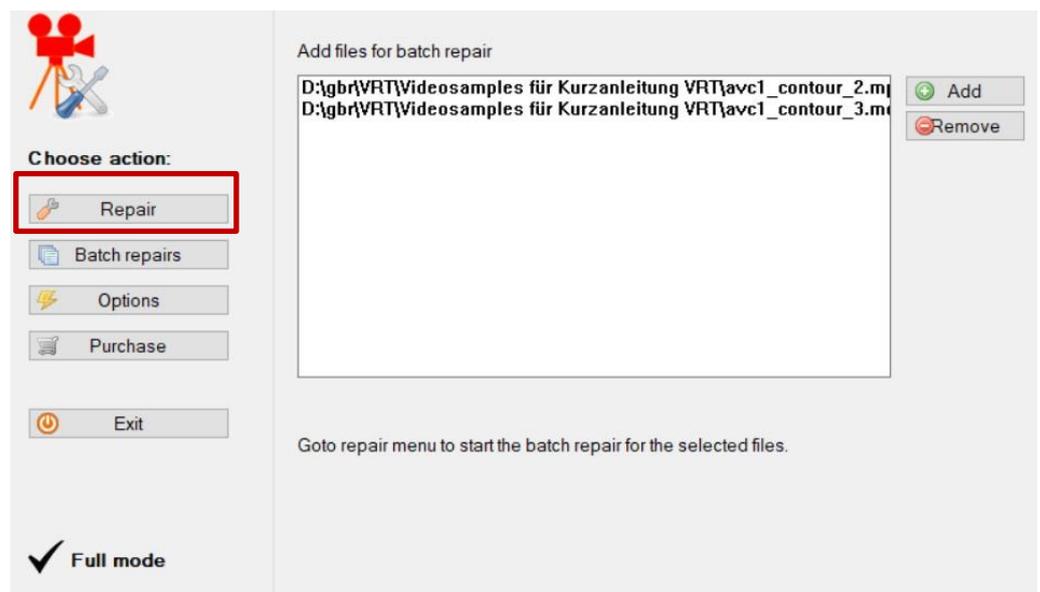

Screen 17: Buttons to add and remove damaged files to a repair queue

6. Click on **Add** in order to find and select the damaged video files which you want to repair.

- The software opens a dialogue in which you can browse your computer's or camera's folder structure.

7. Navigate to the video files which you are going to repair.

8. Select them via hotkeys or mouse click and open them.

   o The selected video files must be located on and taken by the same camera as the reference file. Otherwise, VRT cannot analyze and apply codec information correctly.

   o The software automatically returns to the batch repairs dialogue where the selected video files are chronologically listed.

   o If you unintendedly added a wrong video file, you can remove it from the list via the Remove button.

9. Click on *Repair* again in order to return to the repair dialogue.

Screen 18: List of damaged video files for batch repair

10. Click on *Scan* to start the batch repair process within the repair dialogue.

    o The software analyzes all movie files. It repairs the selected input movies by applying and reproducing the structure of the reference movie.

    o As soon as the software has repaired the input movies, it adds the repaired files' names to the file list.

11. Click on **Preview** to verify your repair results within the programme.

   o The software opens the repaired video file in its internal player.

12. Additionally, click on **Open repair report** if you want to view detailed information on the repair process.

   o The software then automatically saves a short report and a detailed logfile in your output folder. If you did not change the output folder, its standard folder name is **repaired** and it is located in the same folder as the damaged video file.

13. Verify the results of the video repair process in the output folder with your usual video player.

14. If you are not satisfied with the result, repeat the instructions 1 to 13 and adapt the programme options according to your camera type.

   ✓ The batch repair has been completed. Your corrupted, truncated or damaged video files have been repaired and play again.

6.   Common errors and solutions

As it is common whenever software is applied, errors or user questions can also occur while installing and running VRT. The following chart presents the most common errors and their solutions. It also includes some frequently asked questions.

Error or user question	Solutions and answers
The DEMO repair did work, but now the programme doesn't repair anymore.	⮩ Verify if your target medium has enough free disk space for the files you want to repair. ⮩ Disks can get corrupted, too. Copy your target medium before repairing files on it or try with another disk.
I cannot find the Mac executable.	⮩ Download and extract the .zip file on your Mac. ⮩ Check chapter 0 in this manual and our step-by-step-video for MacOS for further instructions.
Why doesn't the repair work properly for some files?	⮩ Check the source medium which contains the movie files for physical damages (with a file recovery programme like MaxData Genius). ⮩ Also verify if the logical structure of the source medium is corrupted. ⮩ In both cases named above, VRT cannot adequately copy the concerned files from the medium and thus cannot repair them. ⮩ Conduct the necessary data recovery processes and try again. In case you want to use MaxDataGenius, you get to the download directly in the VRT main dialogue. ⮩ The programme is not compatible with your video's codec type. ⮩ If you need further assistance, contact us for support.
Where can I find the repaired movie	⮩ The standard output folder is called repaired. The programme

file after having previewed it in VRT?	automatically creates it as a subdirectory within the folder which includes your broken input video.
	⮩ If required, you can select another input folder (as presented in chapter 3.2).
Why do repaired videos sometimes stop when being replayed?	⮩ The programme also tries to recover playback frame order information. This doesn't work perfectly with all video types.
	⮩ Switch off the feature by entering "-noctts" among custom repair parameters in the options.
Do problems during the repair with the demo version also occur in the full version?	⮩ The only difference between the demo and full version is the movie length.
	⮩ If there's a problem repairing the movie using the demo version, it will exist in the demo version too.
	⮩ Due to the complexity of video files, repair issues are always possible.
Why doesn't the programme function on the computer after purchase?	⮩ It is possible that your computer's harddisk or file system have beed corrupted or damaged since the first run.
	⮩ Try redownloading the programme on another harddisk.
	⮩ Redownload and extract the programme, then copy the file 'lic' from your old programme folder into the new one.
The programme shows the message "gs.exe has stopped working".	⮩ If VRT shows this error message, a problem has caused the programme to stop working correctly.
	⮩ Windows will close the programme and notify you that a solution is available.
	⮩ The message indicates that your reference movie is broken or contains invalid meta data.
	⮩ As a solution, try to choose

	another working reference movie.
Is it possible to repair a complete medium (e.g. a SD card) with the programme?	⮑ In order to repair a complete medium with video files on it, you need to create an image file first.
	⮑ Use data recovery software like [MaxDataGenius](#) for image file creation.
	⮑ . Download the recovery software start it and choose your disk or volume.
	⮑ Select **Create Image File** in the menu bar and follow the programme instructions.
	⮑ After completion, run Video Repair Tool and choose the created disk image file as input movie.
	⮑ Choose an intact reference movie, then run the scan.
When I try to start the program it says "missing script file".	⮑ This happens if the .zip archive has not been extracted or not extracted properly.
	⮑ Right-click the .zip archive in Explorer (Windows) or Finder (Mac), and select **Extract all**. Then go into the extracted folder "videorepair", and double-click the file 'gs.exe'.
	⮑ If you have got a PC based on Windows 10 or higher, you may have to allow the software run by right-clickong on **executable,** then selecting **>Properties->allow**.
	⮑ On a Mac device, the error message can also show due to MacOS malware checking.
	⮑ Right-click on the file "mac_start" and select **Open With…->Terminal**.
	⮑ Alternatively, right-click the file "gs", and select **Show Package Contents**.
	⮑ To start the executable, navigate through **Contents> MacOS> gs** by

	double-clicking on each item.
	⮫ For further instructions, also see the video tutorials for [Windows](#) and [Mac](#).
When I try to start the repair, the programme notifies me that it "cannot write to output folder".	⮫ This happens if the program cannot write to the output folder.
	⮫ Make sure your user account has sufficient rights to write to the output folder.
	⮫ Make sure no other running instances of the program are running. Press **CTRL+SHIFT+ESC** to open the task manager, and close any processes named "movdump.exe" or "gs.exe".
	⮫ Try to select another output folder (under **Options**). Then restart your computer and try again.
After repairing a movie with wrong file extension (e.g. .MDT), the repaired movie has still a wrong file extension.	⮫ In Mac Finder or Windows Explorer, rename the repaired .mdt file into .mov.
	⮫ For further instructions, check the video tutorials for [Mac](#) and [Windows](#).
When I repair a movie larger than 2 GB, it seems to stop at 2GB.	⮫ As a workaround, extract a [filesplitter tool](#) on your hard disk.
	⮫ Start the tool, choose your movie file and press on **Split** to split the movie into several 2 GB packets.
	⮫ The smaller packets will be stored into the same folder as your movie file.
	⮫ Finally, run the repair on the smaller packets.
I have a MPEG-4/H264 .ts file recorded by a digital video recorder (DVR). How can I play such file on a PC/Mac or make it DVD-compatible?	⮫ You do not need a repair tool for this, just a converter that will convert your MPEG-4/H264 .ts file into a .mp4 or .mpg file.
	⮫ Download this [video conversion tool](#) (both Win and Mac) and extract it on your hard disk.
	⮫ Copy your .ts file into the input

	folder and rename it to "1.ts".
	⮑ To convert your .ts file into a .mp4 file (for computer playback), double-click on 'win_make_mp4' (PC) or 'mac_make_mp4' (Mac).
	⮑ As an alternative, double-click on 'win_make_dvd' (PC) or 'mac_make_dvd' (Mac).
	⮑ Wait until the console window disappears or the console output stops.
	⮑ If you want just try out the conversion for the first seconds on your file, you can press "q" on the keyboard and the conversion will stop immediately.
	⮑ You'll find the converted file in the output folder.
What is the difference between MPEG-4 and .MP4?	⮑ MPEG-4 is a global multimedia standard, delivering professional-quality audio and video streams over a wide range of bandwidths, from cell phone to broadband.
	⮑ The MPEG-4 standard is receiving tremendous support by many of the premiere internet content providers and other industries.
	⮑ MPEG-4 is a standard describing the video encoding format.
	⮑ MP4 is a file format describing how such video data is stored in a file on a disk.
When played back, the repaired video is shaky with some players only.	⮑ Some video packets in your video file may contain "gaps'" with unused data. These gaps are not detected during the repair.
	⮑ Some players ignore some (e.g. mplayer), some players try to decode them (QuickTime), and this may produce a shaky playback.
	⮑ Reencode the repaired movie files to remove the gaps.
	⮑ Enable "Reencode movie files" under *Options*, then select

	"Custom (ffmpeg)" as preset for reencoding.
	⮱ Enter "mp4: -f mov -acodec copy -vcodec mpeg2video –sameq" into the input field *custom reencoder params*.
What is Apple Intermediate Codec (AIC)?	⮱ The Apple Intermediate Codec is a video codec designed by Apple, Inc. to be an intermediate format in an HDV workflow.
	⮱ AIC does not use temporal compression, every frame can be decoded without the other frames. It is primarily used in Final Cut Studio and iMovie.
The programme shows the message "gs.exe has stopped working".	⮱ If this option is activated, the software reencodes repaired movie files by some encoder programme (ffmpeg or mencode).
How can I change the folder location for the license file?	⮱ Change the home folder variable ("GSHOME").
	⮱ If you are a Mac user, Mac: export *GSHOME=/somePath.*
	⮱ If you are a Windows user, set *GSHOME=C:somePath*.
After video repair, the voice does not match with the video.	⮱ Due to the corruption, pieces of audio or video portions are missing in the movie and that will make them out of sync.
	⮱ This cannot be solved automatically by a piece of software yet and needs a manual repair.
	⮱ One solution for now would be to open the repaired movie into a video editor and split the audio track, and move the splitted parts around, until they match to the video track.
When I want to preview the file in your programme the repaired movie plays fine. When I open the repaired movie in Quicktime/Media Player	⮱ There are two stages involved in the file repair process: *Repair* and *Reencode*.
	⮱ Activate the option *Reencode*

the audio is missing and or the video is pixilated and jumpy.	*repaired movie files* in VRT.
	➲ This fixesthe issue with external players in most, but not all cases. There is no guarantee given with respect to external video players.
Why is the voice off during preview while the audio of the saved file works perfectly?	➲ This happens because the preview uses an internal player, if that player might not understand the audio format of your camera.
My movie files are lost, not only damaged or broken. How can I recover my lost movies from a flash media card or hard disk?	➲ You cannot recover lost files directly In VRT.
	➲ Using data recovery software (e.g. MaxDataGenius) is the only way to recover lost and deleted video files.
	➲ In case your recovered videos won't play in your media player, you can use this repair software as a second tool.

> **Tip:**   This list of errors and solutions relies on current testing processes and customer feedback. It might not be extensive because IT development undergoes very quick changes. This is why hints given by users are always helpful. If you detect an error or a solution which has not been included in the chart yet, please let our company know via the contact form on our website www.grauonline.de. Also contact us for detailed support.

7. Overview of camera types

Evey camera is different and has individual features. Although Video Repair Tool can repair all types of current video files due to the technical principles presented in chapter 2.1, there are some tips and particularities for individual camera types. The following chart sums up the camera types tested by us and our customers together with special assistance and tips for each camera model.

Additional tips for individual camera types

Camera model(s)	Individual tips and features
Canon 574HD	⮑ In order to scan your file for PCM audio, activate the option *Enable PCM detection*.
Blackmagic URSA Mini 4.6K	⮑ In order to scan your file for PCM audio, activate the option *Enable PCM detection*.
Canon 60D, 5D, 7D, T1i, EOS 550D, Powershot SX20, S95	⮑ In order to scan your file for PCM audio, activate the option *Enable PCM detection*.
Contour HD Helmet	
DJI Mavic Pro, DJI Phantom Pro, DJI Vision Plus 2	⮑ If the video stutters, activat the options *AVC1 single mode* and *No CTTS repair*. ⮑ Also verify if the logical structure of the source medium is corrupted
Drift HD720	⮑ Choose the custom repair parameter "-single" under *Options*.
Flip Ultra HD	
HTC EVO 4G	
GoPro, POV.HD, Contour+2, ActionPro X7	⮑ If the repaired video is hanging, activate the option *No CTTS repair*. ⮑ If the audio stream is missing, activate the option *Enable AAC detection*. ⮑ If you have lost or deleted your video fies, you must recover them first, e.g. with [MaxDataGenius](#). ⮑ After you recovered a lost GoPro/ActionPro video from an SD card media, your repaired video may freeze every few seconds. ⮑ This is because this camera stores additional files and your recovery software cannot filter out the

	additional files, so it adds this data to the video files.
	➲ If your videos still don't play correctly after file recovery, repair them with VRT.
iPhone, Nokia N82, Nexus One, all Android phones	➲ If your video was repaired in a bad quality, activate the option **No CTTS repair**.
	➲ If the audio stream is missing, activate the option **Enable AAC detection**.
Liquid Image HD320, Toshiba Camileo S30, B10, P100,AR Drone Quadcopter	➲ Choose the custom repair parameter "AVC1 single mode" under **Options**.
Kodak ZX1, ZX3, ZI8, Z7590	
Nikon Coolpix P300	➲ Choose the custom repair parameter "AVC1 single mode" under **Options**.
Olympus Tough TG-810	➲ Choose the custom repair parameters "AVC1 single mode" and "No CTTS repair" under **Options**.
Oregon ATC9K	
Panasonic HVX200, HXDC1, DC-GH5	➲ If you have a corrupted .MDT file, use it for repair and rename it to .MP4 before running the repair.
	➲ Activate the option **No CTTS repair** if a repaired video is hanging. If the audio stream is bad, activate the option **Enable PCM detection**.
	➲ If your video does not play at all, enable the option **Overwrite existing codec information by reference file**.
	➲ If the import of repaired videos does not work, repaired videos must be converted after repair. Reenconding/converting (using ffmpeg) for import is included in the programme under **Options.**
	➲ If you the select "MP4 (same quality)", the programme will use ffmpeg to convert the videos for import.
	➲ Never apply Panasonic's SD card file recovery (AVCCAM) because then the recovered MOV files are unrepairable.
	➲ Use a data recovery tool like [MaxDataGenius](#) to first extract the correct MOV files from your media.
Samsung	➲ Choose the custom repair parameter "AVC1 single

HMX200, HMXS10, MX20, SMX-F400BP/EDC and many other Samsung cameras	mode" under **Options**.
SIV M7	➲ Choose the custom repair parameter "AVC1 single mode" under **Options**.
Sony XDCAM, EX1, F900, JVC HM100, Matrox MX02, Other MPEG2 cameras	➲ If the audio stream is white noise, open **Options** via the menu bar. Then select the custom repair parameter "at twos" for PCM big endian, or "at sowt" for PCM little endian. ➲ If the video is shake, activate the option **Reencode movie files**. ➲ Select "Custom (ffmpeg)" as a **preset for reencoding,** then enter "mp4: -f mov -acodec copy -vcodec mpeg2video –sameq" into the input field **custom reencoder params**.
Sony DSC-HX1	➲ First select **Enable AVC1 single mode**, then activate **Reencode repaired movie files (MP4 high quality).** ➲ Finally select the option **Overwrite existing codec information by reference file**.
Sony A6500, AX100, A7SII, A7RII, A7II	➲ Activate the option **No CTTS repair**. For PCM audio further select **Enable PCM detection**.
XSplit Broadcaster	➲ Select the custom repair parameter "AVC1 single mode" under **Options**.
Yuneec Typhoon CG03	➲ Among the options, deselect **Detect new movie clips**. Then activate **AVC1 single mode** and **No CTTS repair**.
Zoom Q3HD	➲ With this camera, VRT can only repair video streams but no audio files.

> ❯ **Tip:** This list of camera types, tips and features relies on current testing processes and customer feedback. It might not be extensive because digital technology undergoes very quick changes. This is why hints given by users are always helpful. If you have got a camera which is not listed yet and which you successfully tested the programme with, please let our company know via the contact form on our website www.grauonline.de. Then we can add your specific camera model to the product information. Also contact us for detailed support.

8. Index

9. Glossary

IT term	Meaning	Alternative terms used in the manual
AAC detection	⮑ detection of Advanced Audio Coding during video repair ⮑ AAC: audio coding standard for lossy digital audio compression, ISO and IEC certified ⮑ designed to be the successor of the MP3 format, generally achieves better sound quality than MP3 at the same bit rate ⮑ default or standard audio format for a number of devices and media players, e.g. Android phones and iPhone ⮑ higher compression efficiency than MP3, therefore often integrated in video recording formats	
audio stream	⮑ joint chronological sequence of audio takes and chunks ⮑ individual and complete audio channel , running separately from the video channel ⮑ The audio quality and flow can be optimized according to the user's puposes. ⮑ After repair, the audio stream might still need some manual	audio flow, audio channel

	adjustment in a video editing programme.	
AVC1 single mode	➲ Advanced Video Coding, also known as H.264, MPEG-4 Part 10, Advanced Video Coding (MPEG-4 AVC) ➲ AVC1: block-oriented motion-compensation-based video compression standard ➲ one of the most commonly used formats for the recording, compression, and distribution of video content since 2014 ➲ supports resolutions up to 8192×4320, including 8K UHD ➲ standard capable of providing good video quality at substantially lower bit rates than previous standards like MPEG-2, H.263, or MPEG-4 Part 2 ➲ standard to be applied to a wide variety of applications on a wide variety of networks and systems ➲ typically used for lossy compression, but also to support rare use cases for which the entire encoding is lossless	H.264, MPEG-4 Part 10, Advanced Video Coding (MPEG-4 AVC)
batch repairs	➲ A"batch" is an assembly of files. ➲ The software chronologically repairs several corrupted, truncated or otherwise damaged video files in	

	an automatical order.	
	⮔ It is not necessary to manually initiate every single file repair.	
	⮔ Batch repairs only function if all concerned files are located on the same source medium (camera, smartphone, iPad …).	
chunk (audio or video)	⮔ fixed number of frames which can b individually set by experienced and professional users	
	⮔ a measure to split potentially long signals	
	⮔ can occur with different channels (e.g. video, audio) within a video file	
codec	⮔ all-in-one encoder and decoder solution applied with common video formats	H.265, DivX, XviD H.264, FLAC, MP3 AVI, MKV, MP4 and FLV
	⮔ mainly used with video,image and audio files, but also for text compression and file encoding	
	⮔ common codecs for video files: H.265, DivX and XviD H.264	
	⮔ common codecs for audio files: FLAC and MP3	
	⮔ definition includes joint encoded container files like AVI, MKV, MP4 and FLV	
CTTS repair	⮔ CTTS: Composition Time Stamp	frame order, frame chronology
	⮔ CTTS defines when a	

	sample is played within decoding time.	
	➲ CTTS repair is applied if a camera did not store the taken samples chronologically, e.g for a enhanced technical performance.	
	➲ If CTTS repair is deactivated among the options, the video file is repaired without a fixed chronology of frames.	
	➲ A repair without a frame chronology is recommended if the concerned file is corrupted to a great extent.	
entropy scan	➲ During an entropy scan, the software detects the degree of data compression within a video file's sections and frames.	
	➲ Below a limit of 0.6 (compression value), there is probably no video data available within a section or frame.	
	➲ With a compression value lower than 0.6, further repair processes will fail.	
frames (per second)	➲ number of images played within a second, influences the image flow	images per second
	➲ common standards for frames per second (FPS): 24 FPS (video technology), 48 FPS (cinema movies or computer games with a higher frame rate)	

frame number checking	⮷ Frame number: location of a frame within a video file	defining of frame locations
	⮷ Among the options, users can **Enable strict frame number checking**	
	⮷ The software enforces a stricter chonology while repairing video frames.	
	⮷ If the chain is complete and not broken, activating the option can lead to a better result for strongly corrupted files.	
logfile	⮷ automatically created file which consists of data records of background processes	
	⮷ sums up all logging results of software processes (e.g. video repair)	
	⮷ to be stored as a HTML text file	
PCM detection	⮷ detection of Pulse Code Modulation	raw digital audio
	⮷ straightforward mechanism to store audio on a camera or computer	
	⮷ WAVE file as the most common format for storing PCM data	
	⮷ WAVE supports a variety of bit resolutions, sample rates, and channels of audio	
	⮷ WAVE: based on the Interchange File Format (IFF)	

raw files (video or audio)	⮑ data sets consisting of zeros and ones which needs to be processed and interpreted as video before it can be seen ⮑ plain data ("zeros and ones") from the image sensor before it has a chance to be processed ⮑ no images or videos available until the data is run through a piece of software ⮑ bigger video files than compressed and interpreted files ⮑ if lost, raw files are the last possible data traces to be restored	raw images, raw audio, RAW
recovery (of lost video files)	⮑ Data recovery software is applied whenever files get lost or deleted on a disk, e.g. on a camera's memory card ⮑ Data recovery programmes like MaxDataGenius try to detect lost files and to restore them on an intact target medium. ⮑ VRT has not been designed to recover lost files, so you cannot repair lost files without applying data recovery software first.	file recovery, data recovery
reencoding	⮑ Reencoding is the optional second step of video repair after repairing the file. ⮑ VRT saves the chunks (audio and video streams) of a repaired video to a new movie	

	file, and so adds a new QuickTime container to them.	
	➲ In consequence, the repaired video file can be replayed again.	
	➲ Also raw video or audio data in the file can now be stored into a new playable movie file.	
repair (of available damaged video files)	➲ first step of video repair before reencoding the file	
	➲ codec analysis of both a broken input movie and an intact reference movie	
	➲ files must be located on the same device	
	➲ error elimination on the basis of the reference movie's codec information	
	➲ detects and guesses audio and video chunks in a damaged video file	
repair report	➲ short summary of the repair process	
	➲ presented by the programme as the "compact version" of the full logging information (logfile)	
	➲ to be stored as a HTML text file	
sample	➲ smallest storage unit for video frames with regard to QuickTime container files	outtake
	➲ several samples are defined as chunks	
	➲ make it possible to	

	play video and audio chunks at the same time and in the right order	
	⮑ limited sequence of a video file	
	⮑ often shows only a part of the full movie	
	⮑ often used in video analysis, file testing and file repair in order to get important codec information	
	⮑ represents the "information pattern" applied by a specific camera model	
video stream	⮑ joint chronological sequence of frames	image flow, video channel
	⮑ individual and complete video channel , running separately from the video channel	
	⮑ The image quality and flow can be optimized according to the user's puposes.	
	⮑ After repair, the video stream might still need some manual adjustment in a video editing programme.	