CYPHEROS

# TS-DOCTOR 4.0

## USERS MANUAL

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# 1 INTRODUCTION

Nowadays users can choose among an increasing number of recording hardware that allows to record Satellite or Cable Programs. Unfortunately recordings of Hard Disk Receivers or PCs are often faulty or they are being saved in a proprietary format and therefore won´t play on all devices. Especially Hardware Players like Popcorn Hour, WD-TV-HD or Playstation 3 enjoy growing popularity among users who like to play their recordings at home. But the devices currently on the market react very sensitive on file formats or errors in a stream and refuse Playback, freeze or spoil the playback performance with sound / video dropouts and other kinds of disturbance.

Cypheros TS-Doctor was designed to scan digital Transport Streams for errors and correct them in a way that the resulting file(s) will play back without surges, dropouts or diverging sound and picture on Hardware- or Software-Media players.

Unlike some other tools, TS-Doctor tries to keep the original stream as untouched as possible during error correction, thus avoiding the creation of additional incompatibilities.

## 1.1 Using the TS-Doctor

The processing of a transport stream file is simply done in three steps:

### Step 1: Stream Analysis

Automatic detection of all video/audio/text streams
Automatic detection fundamental stream problems

*You only need to open the recorded file and the analysis starts immediately*

### Step 2: Adjustment (optional)

You can mark unwanted streams
You can change stream details
You can define cutting areas

*With help of the the three buttons "Preserve streams", "Prepare patching" and "Prepare cutting" the stream can be adjusted as desired.*

### Step 3: Stream Rebuild

Stream problems will be fixed
Unwanted streams will be deleted
Previously defined areas will be deleted

*The button "Save new file" starts the repair process and creates a new and improved file according to the desired specifications*

## 1.2 Procedural method of the application

When a file is being opened, TS-Doctor first starts analyzing if its properties match those of a transport stream or not. Is it a regular transport stream with 188 Bytes Package size or is it a M2TS transport stream with 192 Byte Packages?
Afterward the existing elements of the stream are being searched through and ana‐lyzed.

### Analysis of the recording

The format of the recording is analyzed and all elements of the recording are listed. There are various parameters of the recording file checked and, where appropriate, corrected, to bring the file structure and elements in a usable form.

### Cutting of the recording

If after opening the recording the "Prepare cutting" - button is pressed, the areas of the recording can be defined that should remain in the new file. Easy to use editing tools enable the rapid selection of the appropriate areas.

**Checking streams**

When you click on the "Only checking" button TS-Doctor will begin check the stream, without changing your original file. While checking all the stream´s components are permanently being investigated and found CRCs are being checked. Errors are reported in a log.
This step is usually unnecessary, because this is also performed when the new file is created from the original recording (Save new file).

**Clearing up streams**

When you click on the "Save new file" button TS-Doctor will begin cleaning the stream, creating a new copy extracted from your original file. While copying all the stream´s components are permanently being investigated and found CRCs are being checked. Unnecessary elements of the stream or too heavily corrupted parts will be deleted.

## 1.3 Advertisement recognition

Using the information from the broadcast detection and the parameters of the picture and sound, the TS-Doctor can perform an automatic cut.
Various analysis methods are available, from which the TS-Doctor automatically selects the most promising method.
For example, TS-Doctor can detect the beginning and end of a broadcast as well as commercial breaks by changing the AC3 format (number of audio channels) or the aspect ratio (aspect ratio of the picture). Pro7 and other stations often switch the AC3 format during commercial breaks and TS-Doctor can then use this to distinguish the broadcast from the commercials.

In the case of German public broadcasters, TS-Doctor also uses the VPS and teletext data if these are available in the recording file.
With ARD and ZDF, for example, the TS-Doctor can also remove commercial breaks in the early evening program of these stations. However, the Quick Scan should be deactivated for this, since only the complete scan also finds short commercial passages.

If the TS-Doctor detects corresponding features, it offers to perform an automatic cut based on the features found while analyzing the recording.
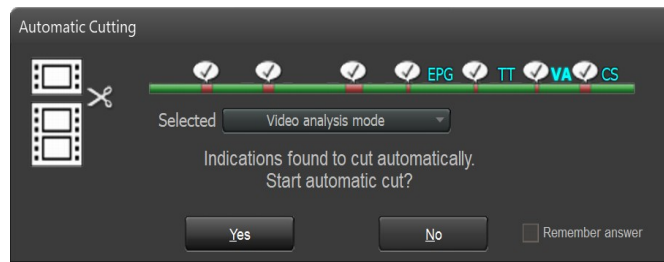
*Illustration 1: Automatic Cutting Dialog*

The TS-Doctor automatically selects the most promising feature, which is displayed highlighted. If necessary, another feature can also be selected with the mouse.

The result of the automatic cut can be checked in the cut window and, if desired, corrected manually.

It should be noted that automatic editing is not available on all channels and its reliability may vary from program to program.

If no format changes or other usable data for detection are found, the TS-Doctor for MPEG2 recordings also supports commercial detection via the free tool "ComSkip" by Erik Kaashoeks, which can be easily installed via the TS-Doctor settings (Settings/Supported Tools/ComSkip).

To improve the quality of automatic editing, the receiver used should be set to record as much data as possible. If possible, teletext and EPG data as well as all audio tracks should be recorded so that a program overview can be created for the automatic cut and more information is available for finding the correct cut points. The operating instructions for your receiver should help you find the optimal recording settings.

With the PC program DVB-Viewer, from version 5.1.0 onwards, the additional recording of EPG data (EIT) can be activated under the recording options. It is also recommended to activate the options for teletext and "All audio tracks" so that as much information as possible is available for automatic editing.

## 1.4 Supported Formats

TS-Doctor supports DVB and Camcorder transport streams (Standard and HDTV resolution) of the following kind

| | |
|---|---|
| .TS | (DVB-Viewer, ProgDVB, Dreambox, Dbox2, Technisat, etc.) |
| .TRP | (Kathrein UFS-910, etc.) |
| .TS4 | (Technisat HD, etc.) |
| .M2TS | (Humax iCord, Sony Camcorder, etc.) |
| .DVR | (Comag SL 100 HD,CMX ) |
| .MTS | (Panasonic Camcorder, etc.) |
| .REC | (Topfield, etc.) |
| .TP0 | (Homecast, etc.) |
| .TP | (DVICO, etc.) |
| .STR | (Sky Box, etc.) |
| etc. | |

and converts them into DVB compliant 188 Byte transport streams (.TS format).

## 1.5 New features of version 4.0

- · 32 and 64 bit version
- · Unified multilingual setup for 32 and 64 bit
- · Window 11 support
- · New ad detection via audio analysis
- · Windows Uxtheme API
- · Improved support for high resolution monitors (High DPI)
- · Improved language selection for audio and text tracks

# 2 The Main Window

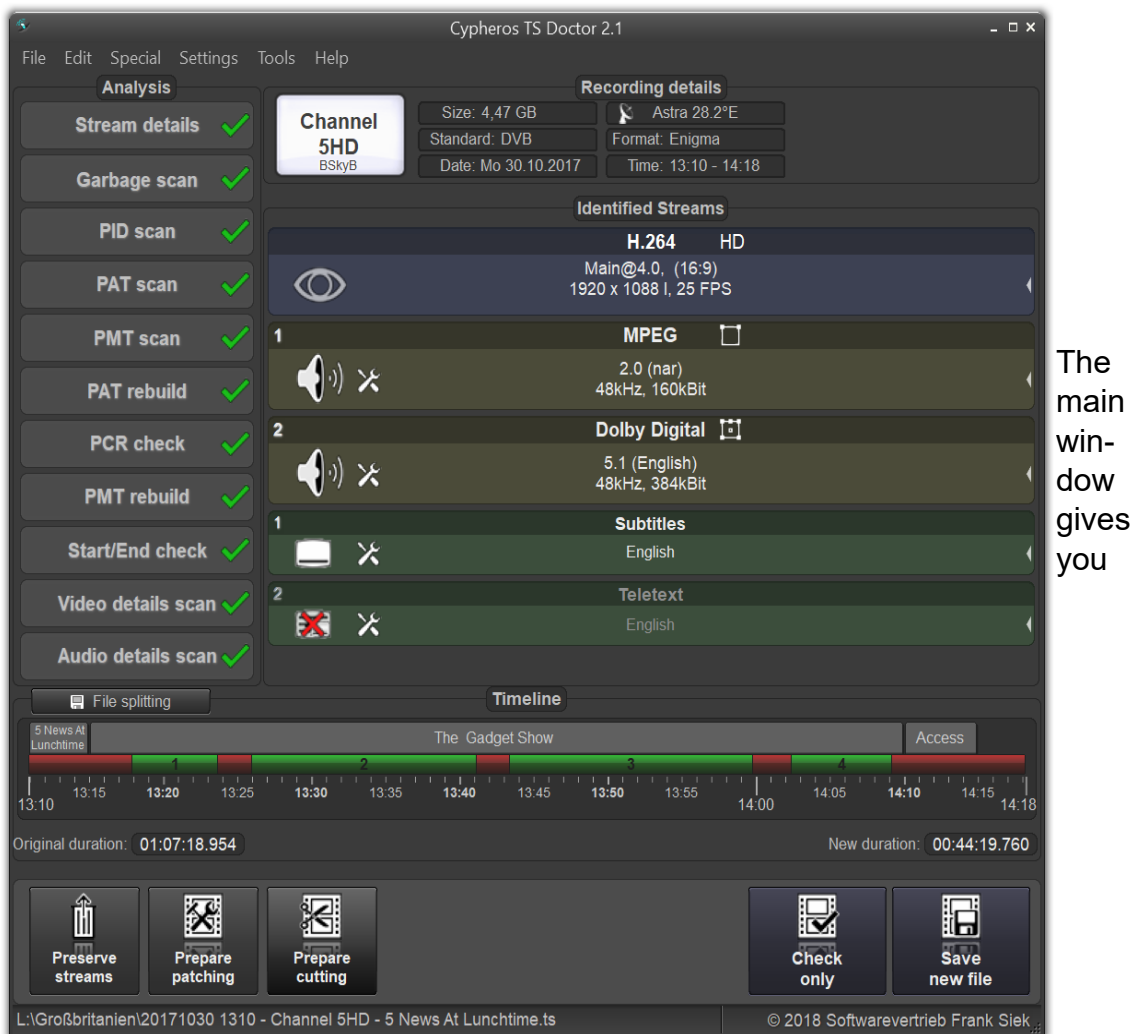

The main win- dow gives you

*Illustration 2: Main Window*

access to all functions of TS-Doctor and provides you with a detailed overview on the features of the opened stream.

When you open a stream, several steps of preparation are being executed. On the left side of the main window you will see their ongoing progress. Each Step should be displayed with a green check-mark, signalizing that the particular step has been carried out successfully.

On the right side of the main window the audio and video streams are being listed, which TS-Doctor found in the opened file and its associated system tables.

# 3 Cutting procedure

TS-Doctor supports cutting of streams to any number of places. This allows to remove commercial breaks from a recording, for example. If the necessary Direct-Show codecs are installed on your system (PC) you will be able to cut your record-ings precisely within TS-Doctor´s video preview window by visually setting trim marks.
Should you ever come across a DirectX error message when opening the preview window, probably a necessary video codec is missing.

## 3.1 Filter/Codecs

Note, that for video preview TS-Doctor by default lets the graphbuilder (DirectX) choose the appropriate filter / respectively video codec for the particular stream. This means that with an AVC/H264 video stream with AC3 sound another filter is being used than with a MPEG2 video stream with MPEG1 sound.

In case your system should have problems with the automatic choice of filters and the video preview doesn't want to appear, you can as well determine a manual com-bination of filters in "Settings/Preferences/Preview".
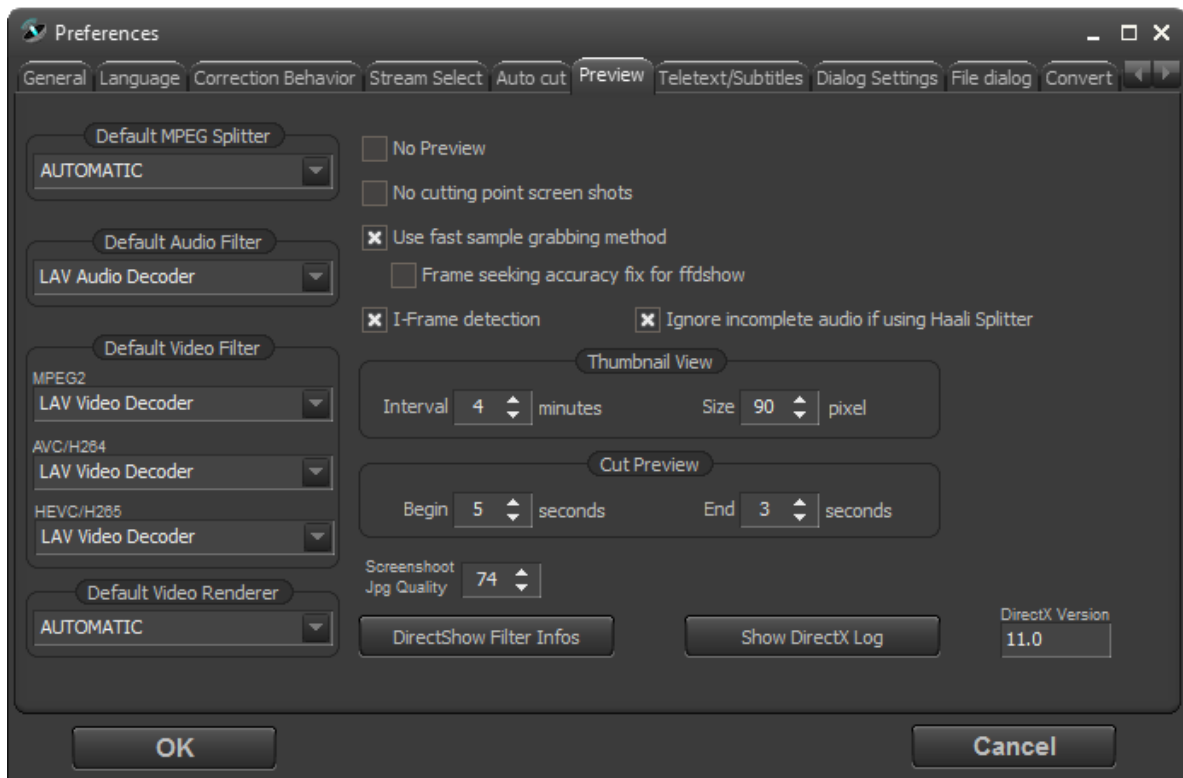
*Illustration 3: Manual choice of filters for video preview*

Of course the filters you want to use, first have to be installed on your system. For license reasons they are not included in TS-Doctor.

The TS-doctor filesource filter is automatically used to open the files and works per-fectly together with the Haali splitter. It ensures the automatic Assembly of split recordings, eliminates disturbing garbage, skips bad packets and builds into the stream missing PAT and PMT packages, so that a preview for the cut is possible even for difficult source files.

The new mode "AUTOMATIC" let the TS-Doctor choose the best decoder filter. On the basis of a compatibility list the filters are choosen that work the best and most reliable with the TS-Doctor.

The option "No cutting point screen shots" turns off the creation of small screen shots in the cutting list.

The option "Use fast sample grabbing method" allows the use of the new features of single frame view, and thumbnail view in the timeline.

In case, problems with certain filters should appear, by clicking on the button "Show DirectX Log" you can let TS-Doctor show you information about the creation of play-back graphs for the video preview.

## 3.2 Cutting/Preview Window



*Illustration 4: Cutting window with visual preview*

In the cutting/preview window you can add cutting areas and determine cutting points of the beginning and end of the selected cutting area of your recording.

The green areas are the areas that are subsequently included in the final stream and the red areas are removed.

You can move the right or left side of the green bar with the mouse or you can wind your video forwards/backwards to the desired destination and then click on the buttons near the input boxes.

By pressing the „Filter" button a list of all used Filters/Codecs will be shown the DirectX-Graphbuilder is using for playback.

Cutting areas can be created using markers. Simply put a marker at the beginning of the area to be cut out. In the lower part of the timeline a yellow marker will appear.



*Abbildung 5: Marking the beginning of the cut*

Forward to the point where the area to be cut ends and place another marker.
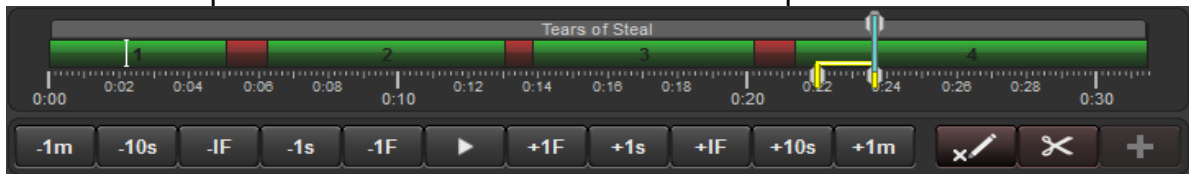


*Abbildung 6: Marking the end of the cut*

By pressing the cut button (scissors) the yellow area is cleared.
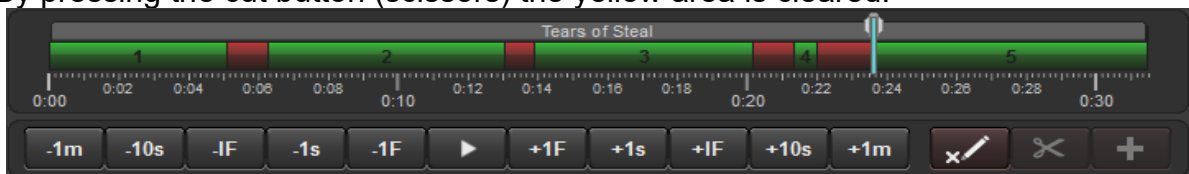


*Abbildung 7: Cut the selected area*

A area can be added in the same way as the cut. Place two markers at the needed positions in the red area.



*Abbildung 8: Marking an area to add*



*Abbildung 9: Adding an area*

You can also press the button ![+] to create a new cutting area at the end of the recording. You can delete the current cutting area with the button ![−] or the Remove key on the keyboard.

However, the cutting areas can also be adjusted afterwards.

With the button ![←] you can move the left edge area (CutIn), with the button ![→] the right edge area (CutOut). In doing so, the cut point is moved to the position where the cursor is currently located within the timeline.

## I-Frame - Detection

The I-frame - detection is a good help to detect the best points for cutting, as in HDTV recordings (h264)  a playback without disturbances is possible only at I-frames. So an I-frame should be chosen for the CutIn and the CutOut.

When shooting in the normal PAL resolution (MPEG2), the TS-Doctor cuts at the GOP borders to avoid greater interferences at the intersections. About 3 frames before the next I-frame  is the optimal CutOut points and about 2 frames before the next I-frame is the best place for the CutIn point .

A typical GOP: I2 B0 B1 P5 B3 B4 P8 B6 B7 P11 B9 B10

The letters represent the frame types and the numbers show the order in which the frames are rendered.

**Assigning areas to separate files**

If you have recorded several programmes or films during a recording and would like to assign them to different files, then this can easily be done in the timeline.
By clicking on the disk icon above the timeline, the file splitting can be activated or deactivated. By clicking on one of the corresponding bars, the assignment and the filename can be changed.
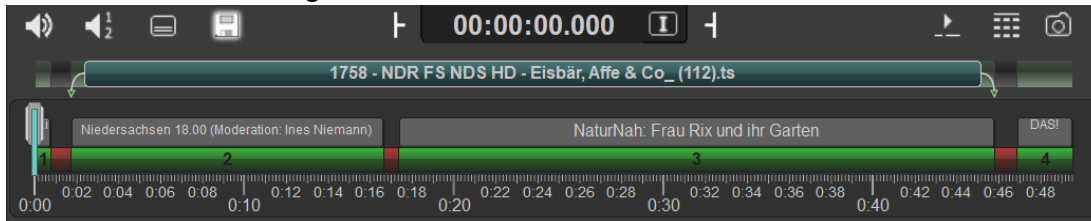


*Abbildung 10: Assignment of cutting areas*

For example, instead of merging both sections and saving them as one file, you can assign the second section to the file „Niedersachsen 18.00.ts" and the third section to the file „NaturNah- Frau Rix und ihr Garten.ts".



*Abbildung 11: Changed assignment of cutting areas*

This is of course also possible for a larger number of cutting areas. However, only consecutive ranges can be assigned to one file. So for example, range 1 to 3 to „file1.ts" and 4 to 7 to „file2.ts", not 1 and 4 to „file1.ts" and 2, 3, 5, 6, 7 to „file2.ts".

## Keyboard Shortcuts

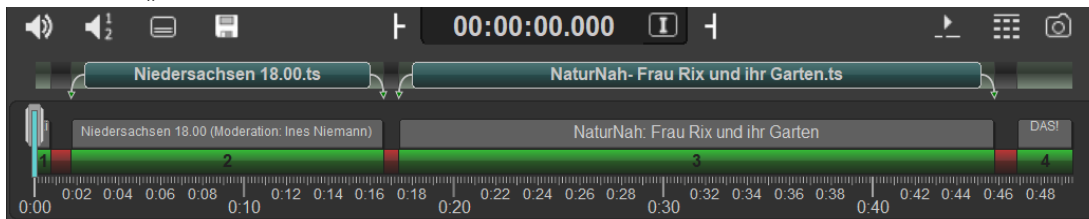| | |
|---|---|
| [x] | Set marker |
| [Del] | Delete marked area (markers invisible) |
| [Del] | Delete selected area (markers visible) |
| [Ins] | Add area (markers invisible) |
| [Ins] | Add selected area (markers visible) |
| [f] | Jump one frame forward |
| [Shift] + [f] | Jump one frame backward |
| [Cursor right] | Jump one frame forward |
| [Cursor left] | Jump one frame backward |
| [i] | Jump one I-frame forward |
| [Shift] + [i] | Jump one I-frame backward |
| [s] | Jump one second forward |
| [Shift] + [s] | Jump one second backward |
| [z] | Jump ten seconds forward |
| [SHIFT] + [z] | Jump ten seconds backward |
| [m] | Jump one minute forward |
| [Shift] + [m] | Jump one minute backward |
| [y] | Jump to first marker |
| [Shift] + [y] | Jump to second marker |
| [n] | Jump to next cutting point |
| [SHIFT] + [n] | Jump to previous cutting point |
| [Home] | Set start time of the current cutting list entry to current position |
| [End] | Set end time of the current cutting list entry to current position |
| [p] | Play/Stop |
| [SPACE] | Play/Stop |
| [CTRL] + z | Undo last action |
| [t] | Divide area at the marker |
| [u] | Invert cut list |
| [c] | Cutting preview |
| [o] | OK, close dialog |
| [ALT] + [i] | Open Screenshot dialog |
| [SHIFT]+[ALT] + [i] | Create Screenshot directly |
| [1] | Single playback speed |
| [2] | Double playback speed |
| … | ... |
| [8] | Eight-time playback speed |
| [SHIFT] + [1] | Single playback speed |
| [SHIFT] + [2] | Half playback speed |
| … | ... |
| [SHIFT] + [8] | An eighth playback speed |
| [ALT] + [1] | 1.5 times the playback speed |

[ALT] + [2]        2.5 times the playback speed
…                  ...
[ALT] + [8]        8.5 times the playback speed

[ALT] + [2]        2.5 times the playback speed
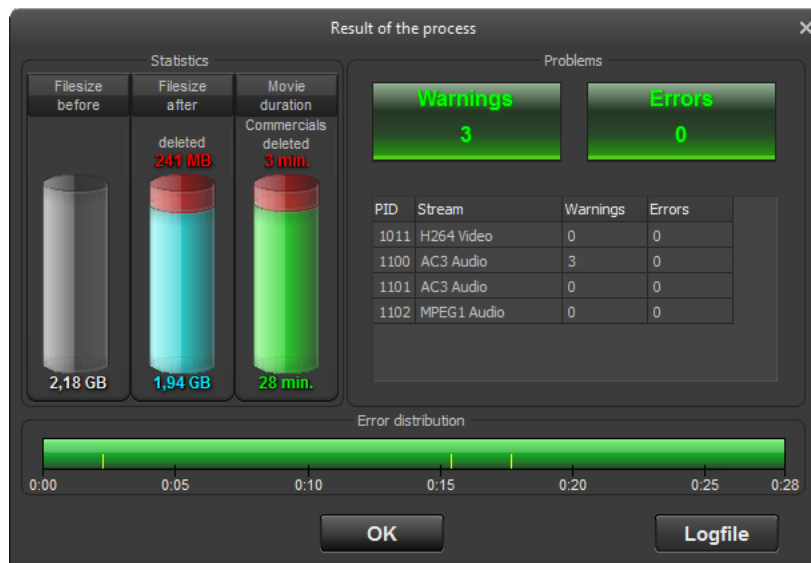
## 3.3 Result of the processing



*Abbildung 12: Result of the processing*

After a new file has been created, a summary is shows with the data selected during the processing. In this example, you can see that the file size has been reduced from the 9,71 GB of the original recording down to 5.47 GB. As TS-Doctor does not change the actual image and sound information, data compression only achieved by removing of advertising and unneeded data streams and fill data. Fill data are redundant data and are often used by broadcasters to obtain a certain minimum data rate. Removing this data resulted in no degradation of image and sound quality, but saves precious space.

Warnings or errors that are found will be shown in this overview. Warnings can usually be ignored and only in rare cases, cause visible or audible errors.
Errors are more fatal, especially if these accumulate in certain area.

DVB transmissions can occur sometimes, but barely affecting the picture and sound quality, as long as they occur only occasionally. Only larger or frequent errors are visible and audible.

The error distribution indicates the accumulation and the temporal distribution of errors and warnings. Red lines are error and yellow lines are warnings.

If you often have recordings with more than two or three failures, this points to continuous reception problems and the receiving system should be checked.

# 4 Deletion of streams

TS-Doctor deletes all streams that are of non audio- or non video- format or which are not registered in the PMT system tables. But some of your recordings may have various audio streams in different languages or different formats like AC3 2.0/ AC3 5.1/ MPEG1, etc.

These different audio streams are listed on the right side of the main window. By sim-ply clicking on one of the loudspeaker symbols you can mark the audio stream for deletion. (Note: Right click opens a menu for changing the language descriptor of an audio stream.)
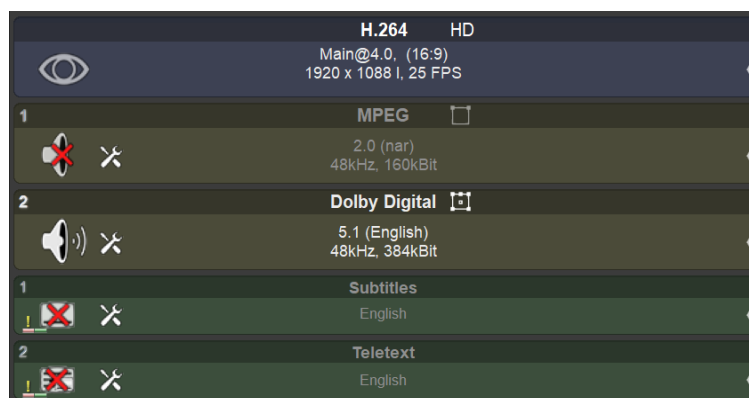

*Illustration 13: Deletion of an audio stream*

Only audio streams can be marked for deletion and at least one audio stream must be left over!

# 5 Preserve

With this function you can avoid streams like Teletext to be automatically deleted. Usually TS-Doctor deletes all non audio and non video streams. If you mark one of these streams in the "Preserve streams" window, it won´t be deleted.
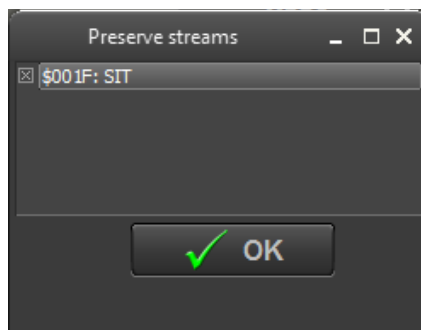


*Illustration 14: Preserve streams function*

# 6 Patch

Especially for Dreambox users TS-Doctor has a function built in that allows you to patch the SID (program number) and the PIDs in order to correct the allocation to the EIT and the Meta-file. Without this correction any files, which were edited with tools like TSMuxer or H264Cutter, can´t be played back correctly on a Dreambox. TS-Doctor´s "Stream Patch" function allows you to reconstruct the original SID and PID allocation.
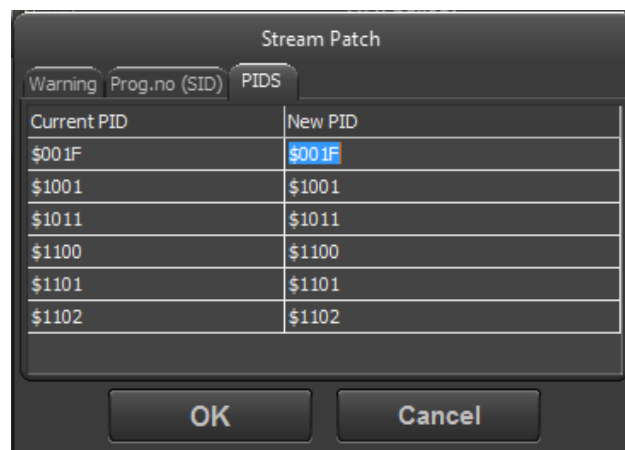


*Illustration 15: Patching of PID und SID-allocation*

# 7 Tools

## 7.1 Raw Cutter

The Raw Cutter allows cutting of transport streams at the package level without alte-ring the stream. This is especially important when a part of a stream is needed for analysis.
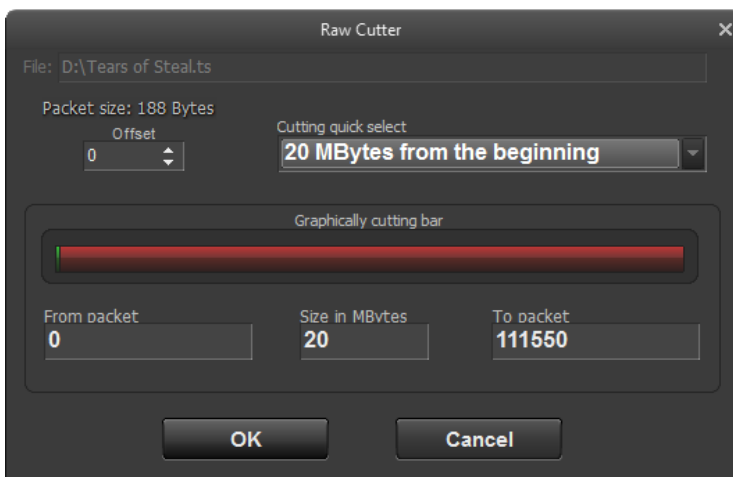


*Abbildung 16: Raw Cutter Tool*

The Raw Cutter also allows to split a recording from a large file into smaller files of 1, 2 or 4 GB size.

## 7.2 Command line parameters

Some features of the TS-doctor can be controlled with command line parameters. Thus, processing of recordings of batch scripts is possible.

**TSDoctor.exe [Input Filename] [Command] [Option] [Output Filename]**

- Command: AUTOFIX ( automatically starts the repair of the file)
- Command: AUTOCHECK ( automatically starts the checking of the file)
- Command: AUTOBATCH ( automatically starts the batch processing of the internal batch list)
- Command: AUTODEMUX (automatically starts the file demuxing)
- Option: CROP=X (Truncates the beginning of the file with X MB when opened)
- Option: LOG (writes a log)

Example:
"TSDoctor.exe" "D:\recording\*.ts" Autofix "D:\archive\"

For [Input Filename], also wild cards are possible as for example *.ts or REC000.*
If wildcards are used for [Input Filename], the parameter [Output Filename] is interpreted as a directory.

# 8 Settings

## 8.1 General

Here you can change general settings like the appearance of the application and file settings.

**Play Sound**
If this option is enabled, a beep will sound at the end of the processing.

**Checking for Updates**
It will be checked regularly for updates (Internet connection required).

**Checking for Beta Updates**
It will also be regularly checked for new beta versions (Internet connection required).

**Show log view**
A log window is displayed below the main window, logging the various steps of analysis and processing.

**Use skin**
TS-Doctor uses a so-called skin engine to beautify the user interface.
When using the TS-Doctor under Linux or MacOS with the help of Wine or Crossover, the skin interface should be switched off, because compatibility problems with the display can occur there. This setting is normally done automatically by the TS-Doctor when one of the corresponding operating systems is detected.

**Disable form animation**
If you do not want the windows to be shown or hidden, you can prevent this here.

**Disable border decoration**

TS-Doctor uses special functions to draw the windows more nicely. But this can lead to display errors on some systems with special "Windows Themes". Herewith the special drawing function of the TS-Doctor can be deactivated. The windows are then drawn in the Windows standard style.

**Use channel logos if available**

TS-Doctor can display station logos if it can assign the recording to a station. Under Settings/Options/Supported Tools/Transmitter Logos you can download a collection of the most common logos. The files are stored under "C:\ProgramData\ Cypheros\TSDoctor3\Logos" as PNG files.

## 8.2 Files

**Additional Data Stream Support (NTFS)**

This setting is special for DVB viewer recordings, which can embed broadcast details in the files via ADS. This feature is only supported by NTFS drives

**4GB File System Warning(FAT/FAT32)**

FAT and FAT32 formatted drives only support file sizes up to 4GByte. The TS-Doctor will give a warning message if you try to save a recording which is probably larger than 4GByte to a disk with a FAT/FAT32 file system.

**Extended options on open files**

This displays additional options in the dialog for opening a recording, which make it possible, for example, to ignore the PAT and PMT as well as the EIT data streams. However, this is an expert setting, the use of which only makes sense in exceptional cases.

**File mangling**

TS-Doctor appends "_fixed" to the end of the filename when creating a new file, if so requested, to make it easier to distinguish repaired files from the original recording files. The "Automatic" setting creates the file name from the title of the show or movie as far as possible.

**Remember last used folder**

TS-Doctor remembers the last used directories for opening and saving files. If you then open or save a file again, the file dialog starts automatically in the last used directory.

**Create repair log file**

This generates a detailed log for each processed recording.

**Create recording info file**

TS-Doctor can also save the found broadcast information (station, recording duration, recording date and broadcast description) to a separate file for each generated file. This can be especially helpful for archiving recordings.

**Enigma files**

Enigma recordings contain additional files, with recording details and index data, which allow fast forwarding and jumping. If such a recording is edited, these files must be modified if the recording is to be played back on an Enigma receiver.

## 8.3 Language

**Language**

Here you can set the language used in the user interface.

**Language Editor**

The language editor allows you to create new language files or correct existing ones.

## 8.4 Auto Cut

TS-Doctor can detect broadcast data (beginning, end, title, description) and possibly commercial breaks based on various metadata that are often included in the data stream. After opening and during the analysis of a recording, the TS-Doctor tries to find usable metadata for the auto-cut. Here you can make settings to configure the auto-cut.

You can activate or deactivate the different procedures for the auto-cut. The Quick Scan speeds up the search considerably, but may miss shorter commercial breaks (shorter than 5 minutes).

**General**

**Automatic cutting**

If the TS-Doctor should automatically try to detect during the analysis of the recording whether there are corresponding indications for the beginning of the program, the end of the program as well as commercials, then this option should be activated. However, a manual search with different methods is also possible via the menu.

**Remove incomplete shows at the beginning and the end**

Since recordings are often made with a few minutes of leading and trailing, the file also still contains parts of the broadcasts that lie before and after the desired broadcast. TS-Doctor removes with this function the broadcasts at the beginning and at the end of a recording, if these broadcasts are incomplete.

### Split recordings to multiple files

If several programs were recorded in succession, the TS-Doctor can try to separate the individual programs and assign them to a separate file. The program title is then automatically used as the file name.

## AC3 mode

### AC3 scans

Specifies the number of areas that will be analyzed for their audio format during the analysis. If changes in the sound format are detected, automatic editing in AC3 mode is possible. The default value is 18 scans.

### Prefered AC3 detection mode for commercials detection

By setting "Prefer 5.1, delete 2.0", the area with AC3 5.1 sound is counted as a movie and the AC3 2.0 area as an advertisement.

By setting "Prefer more frequent mode", the area that has the largest portion of the recording is counted as a movie. If AC 5.1 audio predominates in the stream, then the area with AC3 5.1 is counted as a movie and the rest as commercials to be deleted.

## Aspect/Ratio mode

Detection of broadcasts via the change of aspect ratio.

## VPS mode

Some channels like Das Erste, ZDF, WDR, 3Sat, KiKa, SRF 1, SRF 2 and RSI LA 1 transmit a VPS identifier within the teletext data stream which the TS-Doctor can evaluate for editing.

## EPG mode

Some receivers also store the EPG (EIT) in addition to the video, audio and text data streams. The TS-Doctor can evaluate the broadcast information contained therein and thus perform an automatic cut.

## 8.5 Correction behavior

Here you can set which special corrections the TS-Doctor should make to the data stream.

### Prefer cutting before cut out point

The cut-out edit point is usually followed by a commercial break. However, since the TS-Doctor cannot cut frame accurately, all frames would still be visible until the next P/I frame. By activating this option, the P/I frame before the cut point is selected; this ensures that no frame of the advertisement is visible.

### Insert AC3 5.1-Frames, if needed

For recordings that have format changes, incorrect detection of the correct AC3 mode may occur if a 5.1 recording still has some AC3 2.0 packets at the beginning. Some media players only check the first audio frames and set the audio format for the whole recording accordingly. TS-Doctor can insert additional AC3 5.1 frames at the beginning to help these players. Nevertheless, the use of this function is not recommended, because it can also cause compatibility problems. The TSMuxer for example does not cope with such files.

### Ignore TS „scrambled" Flag

The scrambled flag indicates whether a recording is scrambled or not. The TS-Doctor normally detects automatically if this flag is set incorrectly and corrects this. In exceptional cases this automatic correction may fail. You can use this setting to force the TS-Doctor to ignore this flag. But if the flag is set correctly and a recording is actually encrypted, the attempt to process the recording can lead to a program crash in extreme cases.

### Fix incorrect TechniSat cuts

Many TechniSat receivers contain an internal editing function to cut recordings. Unfortunately, such cut recordings only work on the receiver itself. If you want to process the recording, convert it or play it back on another device, there are problems, because the editing of these receivers does not correct the timers within the data stream correctly, as it would be necessary for a correct cut. The TS-Doctor can detect and correct these errors in recordings from TechniSat receivers. However, this requires an additional pass and costs some time. It is better to use the TS-Doctor instead of the internal TechniSat editing for recordings that you want to process further.

### Treat no PIDs as reserved

Usually, according to the DVB/ATSC standard, PIDs 0 to 31 are reserved for special purposes. However, there seem to be some IPTV stations in some countries that do not adhere to the standard and also put audio and video streams in this range. So that these can be processed by TS-Doctor anyway, this option can be activated. For

DVB/ATSC compliant recordings, however, this option must be disabled, otherwise errors may occur during processing.

### Search for scrambled areas (descrambler failures)

With function performs an additional search for encrypted areas in the recording. With some receivers or their decryption modules, malfunctions can occur that result in the recording not being fully decrypted and areas of the recording becoming unusable. This can be detected automatically and the corresponding areas marked for editing. Without this error handling, cutting and processing such a recording is very problematic.

### Reorder audio in PMT (WMP12 Fix)

The Windows Media Player 12 sometimes has difficulties to play back the sound of DVB recordings correctly. In such cases no sound is heard during playback. The TS-Doctor can work around this problem by modifying the PMT (Program Map Table, a kind of table of contents). The correspondingly prepared file should then also play correctly with the Windows media player. This only affects the Windows Media Player 12, other media players do not show this problem.

### Remove start packets without payload

Some channels have start packets without payload (data) appearing in the data stream. These can lead to problems during further processing and should be removed.

### Stream standard

Here you can set the standard that TS-Doctor should expect for your recordings. Worldwide there are different standards for the transmission of TV programs. The most common TV standards are DVB and ATSC.
For Europe DVB is the right choice. In the USA and Canada ATSC should be chosen.

### Default language

If the TS-Doctor has problems to recognize the language of a certain audio or subtitle track, the language set here will be used.
The language information is normally specified in the PMT. Some receivers, such as some TechniSat models, do not store this PMT data in the recording file.

### Extended PCR check

The TS-Doctor requires PCR data from the beginning and end of the exposure to correctly determine the run time of an exposure. These are usually found within a short time. However, some receivers produce larger areas of garbage data at the beginning and end of the recording and require more extensive checking. Normally the TS-Doctor searches about 50MByte at the beginning and at the end to find the necessary data. But you can increase the value with this setting.

**Timer correction**

The TS-Doctor changes the itimers only if necessary, because any change can lead to a loss of synchronicity between picture and sound. However, the timers should definitely be corrected if a PCR wrap is present, since most media players cannot play recordings with PCR wrap.

However, a few media players also basically only like recordings where the timers start at zero. This can be enforced via the "Always patch" setting.

**H264 special settings**

Here settings can be made specifically for processing H264 (AVC) HDTV recordings.

**Concider I/P frames for cutting**

This setting is recommended to avoid image errors (artifacts) at the cutting edges.

**I-Frames only cutting**

Some media players produce artifacts during playback despite I/P frame editing. To avoid image errors (artifacts) at the cutting edges of these devices as well, the exclusive use of I-frames for editing can be enforced.

**Remove disturbing B frames**

This setting is recommended to avoid image errors (artifacts) at the cutting edges.

**Skip B frames removing at stream start for 720/50p**

With older recordings of public channels in 720p, image interference could occur at the beginning. This option can be activated to avoid these disturbances with such recordings.

**Remove filler data (NALU12)**

Many channels use fill data to maintain a minimum data rate. However, these data are only necessary for transmission. They are not required for playback. By removing this data ballast, the recording file can be reduced in extreme cases by 50 to 70% without negatively affecting the picture and sound quality.

## 8.6 Preview

Here you can make settings for the cut preview such as the playback filters that the TS-Doctor should use for the preview.
If there are problems during playback with the automatic setting in the Timeline, you can manually select the playback filters from the list here.

**No Preview**
Playback in the preview window can be disabled with this setting.

**No cutting point screen shots**
The TS-Doctor normally creates a preview image for each intersection point, so that you can see exactly the first and last image of an intersection area. The creation of these intersection images can be deactivated with this setting. This setting is for experimental purposes.

**Use fast sample grabbing**
To create the intersection images quickly, the TS-Doctor uses a fast sample grabber. In rare cases, this can lead to playback problems, which can be circumvented by deactivating the sample grabber.

**Frame seeeking accuracy fix for ffdshow**
If the ffdshow filter package is used for playback, this setting can be used to improve the behavior of the ffdshow filter when it comes to jumps (+/-F, +/-IF, +/-1S).

**I-Frame detection**
The use of the I-frame detection makes it possible to detect the I-frames in the cutting window. Since the TS-Doctor cuts best at the I-frames, it can be used to determine the exact cut point.

## 8.7 Teletext/Subtitles

Here you can adjust settings for teletext processing. In addition to VPS editing information, the teletext can also contain subtitles and information about the current program or a list of the day's programs.

### Teletext processing
This activates the basic processing of teletext data for extracting subtitles, for example.

### Teletext analysis
This activates the analysis of the teletext for the cut and the broadcast information.

### Ignore parity errors
TS-Doctor normally ignores teletext data that has parity errors so that the extracted data is correct. Apparently there are some broadcasters in the UK area that do not set the parity bits according to the DVB standard; This means that no subtitles can be extracted. By ignoring the parity errors, these special recordings can also be processed. Basically, however, this setting should not be active.

## Teletext subtitles

### Extract Teletext subtitles (srt format)
If requested, TS-Doctor can convert the found teletext subtitles into the widely used SRT format. An additional file with the extension .srt is created for each teletext subtitle.

### Extract subtitles only from this pages
Der TS-Doctor kann auf Wunsch auch nur Untertitel von bestimmten Teletext-Seiten extrahieren. Dadurch lassen sich unerwünschte Untertiteldateien vermeinden.

### Time offset
If the teletext subtitles appear too early or too late for you, this setting can be used to apply a time offset to the time information. You can use it to display the texts a certain number of milliseconds earlier or later.

## DVB Subtitles

### Extract DVB subtitles (srt format)
Der TS-Doctor kann auf Wunsch DVB-Untertitel per OCR in das verbreitete SRT-Format umwandeln. Pro DVB-Untertitel wird eine zusätzliche Datei mit der Endung .srt erstellt.

### Extract subtitles only for this languages

TS-Doctor can extract subtitles only from certain DVB subtitle languages if desired. This way unwanted subtitle files can be avoided.

**Time offset**

If the DVB subtitles appear too early or too late for you, this setting can be used to apply a time offset to the time information. You can use it to display the texts a certain number of milliseconds earlier or later.

**Mode**
- Tesseract: Original text recognition method (faster)
- LSTM: New method using neural networks (somewhat slower but with significantly lower error rate)
- Combined
- Default: Language dependent selection of the mode

**SRT subtitle formatting**

**Include color attributes**

TS-Doctor can also extract the color information of the subtitle texts if desired. Without this setting the subtitles are only monochrome.

**File extension**

Here you can choose how the different subtitle files are named, either by teletext page number or by subtitle language.

**Text encoding**

Here you select the text encoding. Consult your media player's manual to determine which format your player accepts. Ansi encoding is the most common, but can cause problems with foreign special characters. The TS-Doctor uses the current codepage of the Windows it is currently running under when Ansi encoding.

## 8.8 TS Format Converter

Here you can make settings for the integrated TS format converter.

## 8.9 Supported Tools

Here you can make settings for tools that TS-Doctor supports or download that tools.

# 9 Miscellaneous

## 9.1 Effects when you select of a wrong color space

In their menu under "HDMI Settings" most up-to-date devices offer you the possibility to adjust the color space being used for playback. Manufacturers use different names like Colorspace, RGB-Level, RGB-Range, Color-Range or RGB output area.

You can choose between two possible settings: "PC color space" and "DVD/DVB color space". The PC color space (Enhanced, Full or L2 color space) utilizes brightness values from 0 – 255. The DVD/DVB color space (Limited or L1 color space) utilizes brightness values from 16 – 235.

Because video data from your playing device (DVD-, DVB-, Bluray or Mediaplayer) is being sent pixel by pixel to your output device (TV, beamer, monitor) via HDMI/DVI, the output device must exactly know how to display the brightness values of all pixels.

If for example a DVD player sends the brightness value" 16" for a pixel to a LCD-TV being set to DVD/DVB color space, the pixel would be displayed as the deepest Black possible for the TV set. If the TV set were adjusted to PC color space instead, the same pixel would only be displayed in a dark Grey, because there are sixteen more possible brightness values down (15 – 0) to the deepest Black. The same difficulties exist with the presentation of White, because the brightness value "235" could either be the brightest White or only a slight Grey.
So it´s important to set  playing- and output- devices to the same color space in order to get the correct brightness values being displayed.

Some negative effects are being produced by misleadingly flagged HDTV DVB streams, e.g. broadcasts from German Premiere TV channel "Discovery-HD". In this

case the flag "video_full_range_flags" (which means PC color space) is wrongly being set active. But DVB streams usually should be broadcasted within the DVD/DVB color space as being regulated by DVB standard. DVB receivers ignore the flag and by default operate within DVD/DVB color space. However, if you playback such a DVB stream on a multimedia player like "Popcorn Hour", the same problems arise with these streams that you usually get with wrong HDMI color space adjustment.



*Illustration 17: Effect of a wrongly set "video_full_range_flag"*

# 10 Links

- [Cypheros Homepage](#)
- [TS-Doctor email support](#)
- [CoreAVC from CORECODEC](#)
- [Mediaplayer Classic HomeCinema](#) (free open source media player)
- [Wikipedia: MPEG transport stream](#)

# 11 Film Clips

This document contains images from the movie "Tears of Steel" from the Blender Foundation.

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# 12 Trademarks

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