

Custom subtitling revised through DvdReMake

Introduction:

First a little background....

As you probably know, adding custom subtitles to DVD's is getting more and more popular.

However, most people can't handle programs like Scenarist, and prefer Maestro instead. Although muxing in Maestro is simple, it's very limited for the average user. As soon as you have to mux a multi-PGC, you're already stranded, and that's only one of the simpler problems you can run into.

Also, almost every way of doing it at the moment includes IfoUpdate. This tends to mess up a lot of stuff. I've seen discs getting totally corrupted by running IfoUpdate after you replaced the main movie with the newly muxed version.

Therefore I've devised and tested the following procedure, which is still in the fine-tuning phase, but which should be "evolved" far enough to be an enhancement to the current methods.

So, what's the main problem with the current methods...?

Well, like I said, IfoUpdate can do a lot of destructive work to the IFO's. In the IfoUpdate process, you "patch up" the IFO's created by your muxing application, in order to match the original IFO's.

But why would you need your muxing output IFO's? There is already an IFO with a DVD-structure present, so why not just use that.

Basically, all we need/want to do is to replace the video content with another that contains an additional subpicture, as we want to keep the rest of the disc intact.

So, looks good so far? Well, the test-results sure do. The new way of integrating the muxing output into the original movie has been tested on about 25 movies, including complicated DVD-structures like "The Forgotten", "Meet The Parents", and Arcoss protected discs. Also, the output has been tested on a LOT of players, all with no compatibility issues.

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Release notes and limitations:

Well, one of the main purposes of this guide is to keep it as low level as possible. Therefore I will be using Muxman as my authoring tool, as it's the most simple muxing tool around. However, due to this fact, we are "stuck" with the limitations Muxman has. These are:

- maximum of 4 audio tracks
- maximum of 8 subpicture tracks
- no multi-angle support
- no visual checks before actually starting the mux

Looking at these limitations, we should be able to handle 98% of the discs out there. As I usually use DVDMaestro or Scenarist as my muxing applications, there might still be some issues I haven't run into using Muxman.

Also, as I already stated, this guide is slowly "evolving" as it doesn't reside on top of my to-do list. So I'll mainly focus on the muxing and rebuilding part for now, as there are numerous guides already out there for the other sections.

Although a disc like "The Forgotten" can be handled by this procedure, it will be discussed as add-on, because the procedure is slightly different, and might confuse users. The main focus will be properly adding a subtitle stream, whether the source is multi-PGC or not. Arcross protected discs will also fall under the extra complicated section of the guide, so read that section first, before you start ripping.

Throughout this guide all screen reference numbers will be indicated between ().

Tools needed:

- DVDDecrypter
- Mounting tool (Alcohol120% or DaemonTools)
- SubRip
- Subtitle Workshop
- MaestroSBT
- PGCDemux
- Muxman (0.14D+)
- DvdReMake (v3)

So, let's start playing...

Chapter 1: Ripping the DVD to your hard disk

Every step will run much smoother from your hard disk, compared to your DVD-drive.

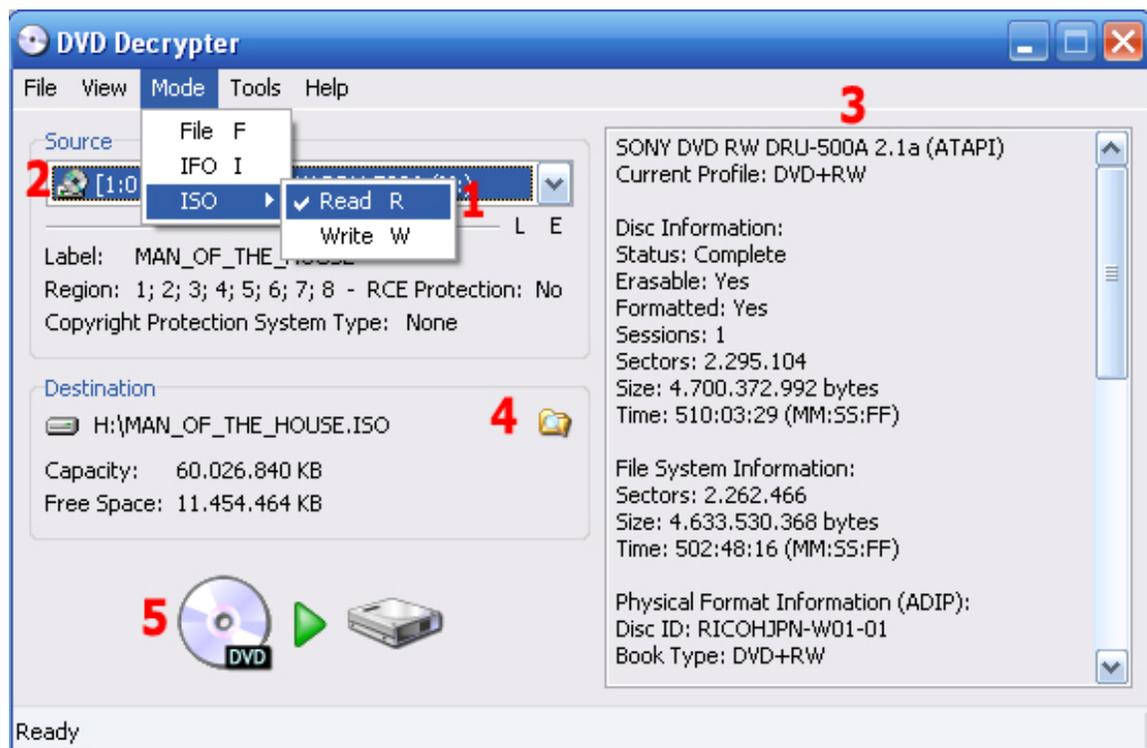
There are 3 possibilities.

1. You've obtained it as a VIDEO_TS folder.

You're set to go.

2. You've obtained as a true DVD.

We first need to create an image which we can mount. We start by opening DVDDecrypter.



In DVDDecrypter select "Mode" and then "ISO" and "Read R". (1)

Then we select the source drive from the "Source" drop-down menu. (2)

You will see a bunch of info (3) on the right side of the screen now. It's just an overview of the disc.

So, just alter the output directory at "Destination" (4), and press the "DVD to HD" icon (5).

When the export is finished, we are done with DVDDecrypter, so we can close it down.

3. You've obtained the movie in an image format (.iso, .img, etc...), or just created one with DVDDecrypter.

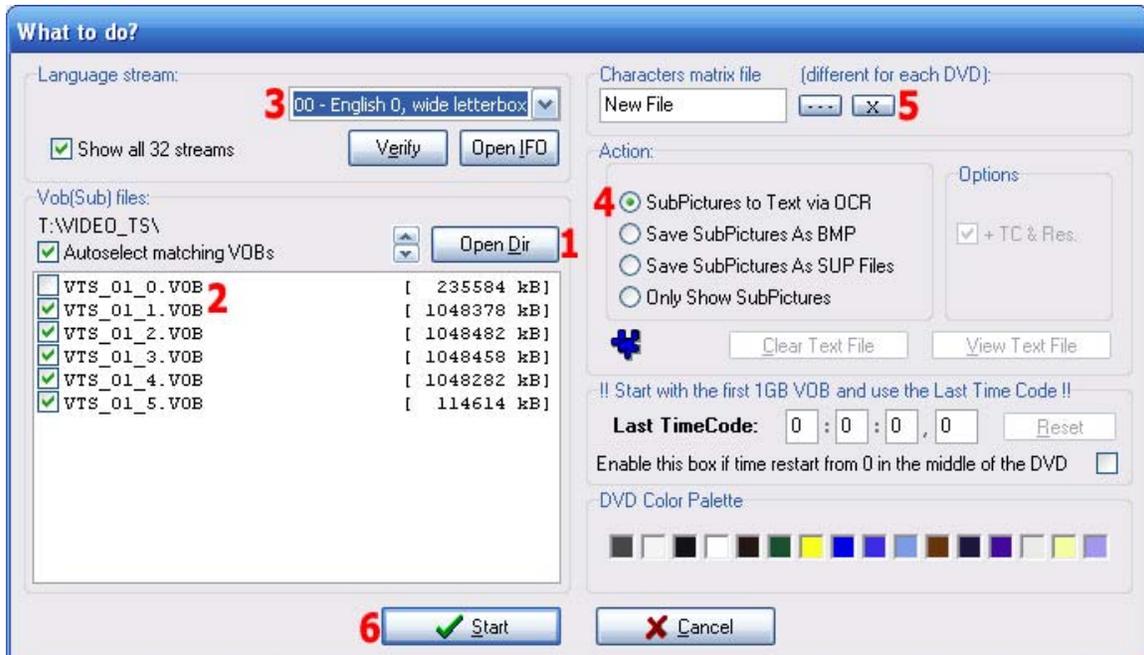
Just mount it as a virtual drive with Alcohol120% or DaemonTools.

From this point forward, we will be processing everything with the virtual drive or the VIDEO_TS hard disk folder as our source.

Chapter 2: Collecting assets to make a custom subtitle

If you already have a subtitle file ready you can proceed to chapter 4.

We start by opening SubRip. In SubRip we select "File" and "Open VOB(s)"



Then press "Open Dir" (1) and select the main movie VOB in the pop-up box.

SubRip will now tell you how much subtitle streams it has found. Make sure the checkboxes are set for every main movie VOB, and not for the menu VOB (2).

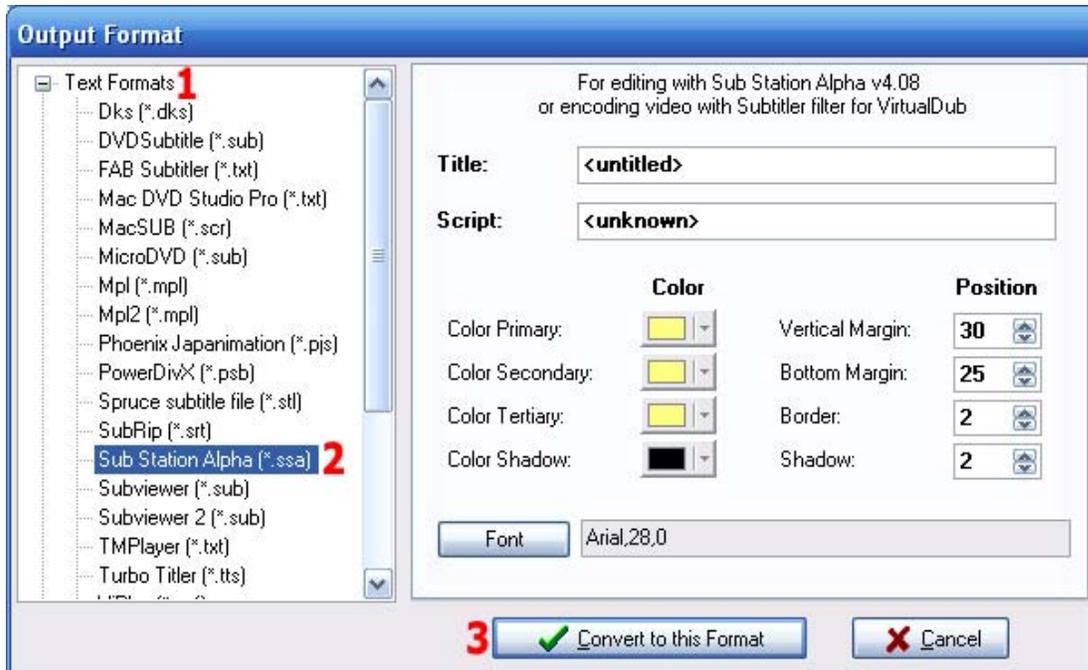
From the dropdown menu (3) select the subtitle track you want to rip.

Select the radio button "SubPictures to Text via OCR" (4).

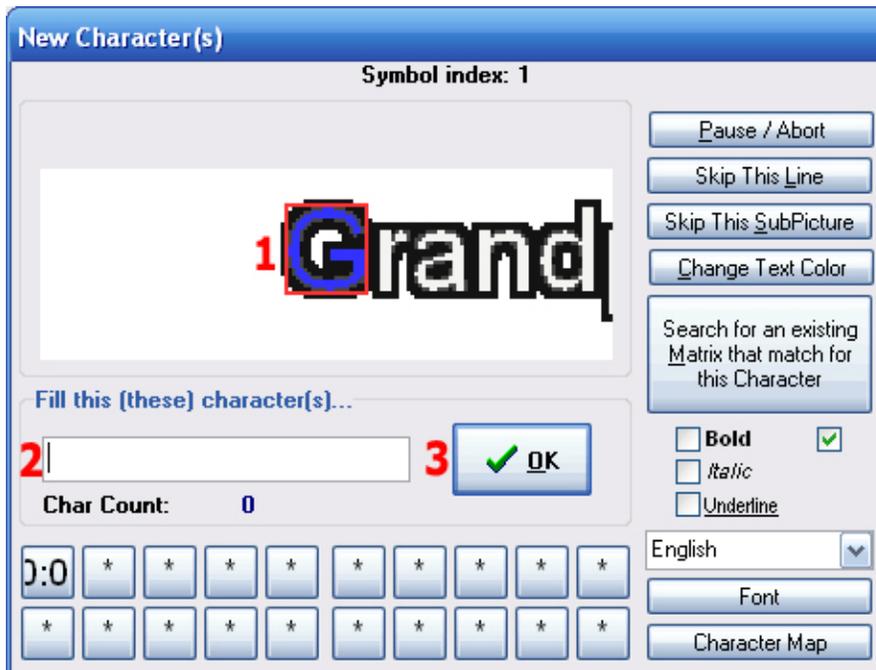
If you already have a character matrix, load it in (5). This will save you some time.

Hit "Start".

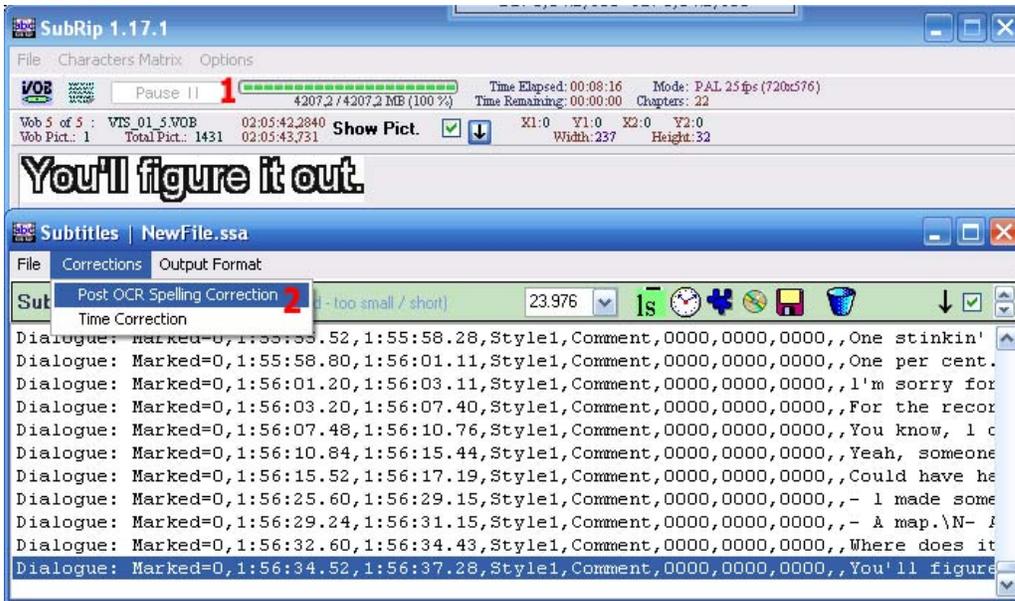
If you changed modes at the radio button you will be asked for the output format. If it was already at "SubPictures to Text via OCR" (4), then it will remember the last selection.



From the pop-up menu expand “Text Formats” (1) and select “Sub Station Alpha (*.ssa)” (2). Now press “Convert to this format” (3). All the other settings don’t matter, as we won’t be using them.

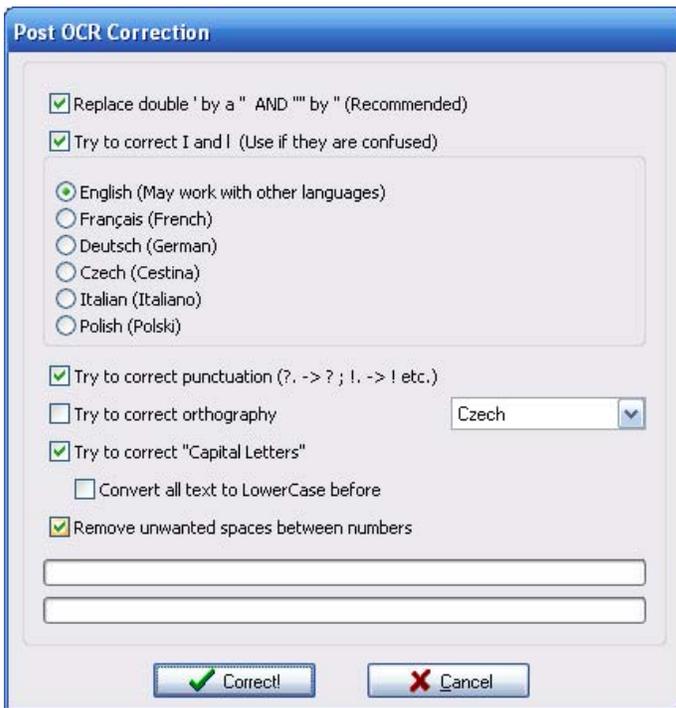


SubRip will now ask you to enter the highlighted letter (1) so it can reference it. Enter the character (2) and click “OK” (3) or simply press “Enter”.



Repeat the character entry process until the progress bar reaches 100% (1).

In the bottom section select "Corrections" and "Post OCR Spelling correction" (2). Then select the corrections shown below, and hit "Correct".

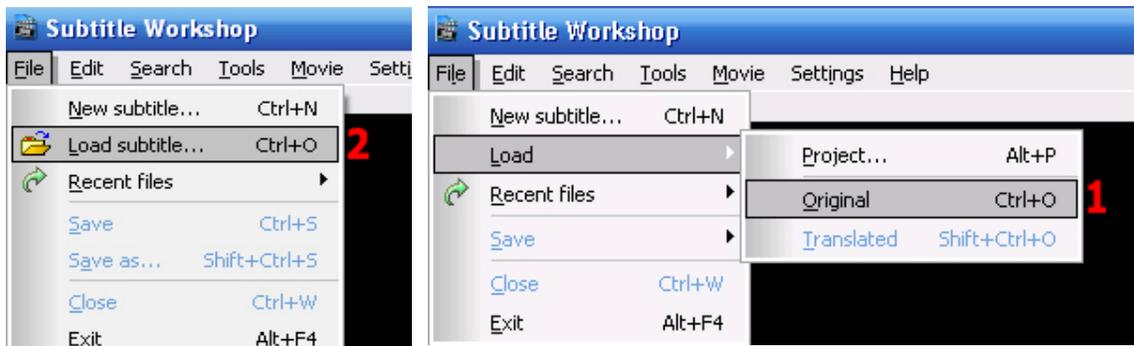


Again in the bottom section, select "File" and "Save as". Select the directory where you want to save, and give the file a name.

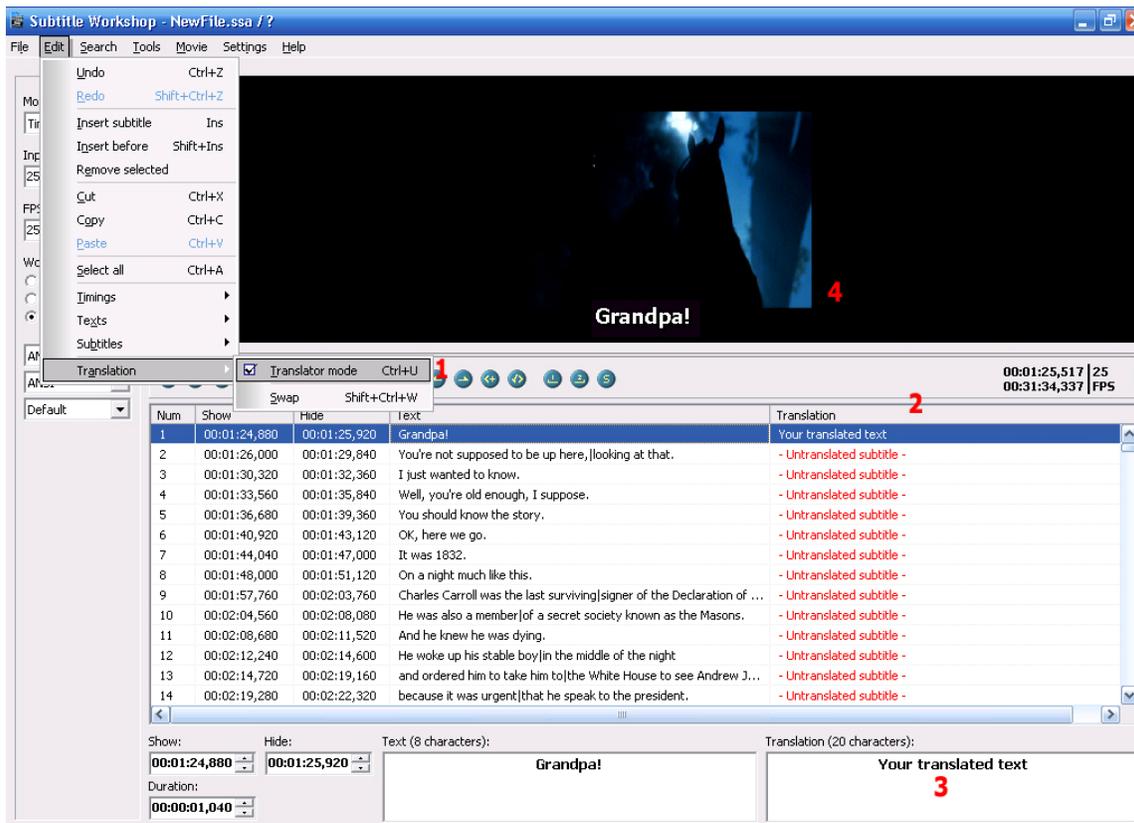
We are done with SubRip for the time being, so close it down.

Chapter 3: Creating a custom translation

We begin by starting Subtitle Workshop.



Open your newly created .ssa by selecting “File”, and “Load subtitle...” (2), or “File”, “Load”, and “Original” (1) if Translator mode is already activated.



If Translator mode is not already activated, select “Edit”, “Translation”, and “Translator mode” (1). You will now see that a second column is shown. (2).

To translate, just enter the text in the translation box (3). You want to make sure that you stay under 40-45 characters per line, with a maximum of 2 lines.

If needed, you can load the movie for reference (4). Do this by selecting “Movie” and “Open”. However, loading the VOB's directly into Subtitle Workshop might affect timing due to some bugs in Subtitle Workshop. It's better to first strip it down to an .m2v file (no audio) or convert it to an XVID. This will give no problems with playback, and is a single file, so the timeline will match as well. Stripping down to .m2v will be discussed in chapter 5.

You can switch playback between the original text and the translated text. Do this by selecting "Movie", "Display", and then either "Original" or "Translated".

Note: Some words of advice. Save your translation often, and after EVERY save, check the output file. Subtitle Workshop is known to have a couple of glitches when saving. If a save failed, try saving the original first, and then the translation again.

Once your translation is finished, we make a semi-final save. After this, we want to check the subtitles for errors. There is a spelling-checker built into Subtitle Workshop. You can access it by selecting "Tools" and "Spell check" or simply press F7. Next to that there are some rules a subtitle needs to abide to.

So we want to proof these rules. However, these checks are done on the original, so we can't run them directly. There are 2 options:

- Select "Edit", "Translation", and "Swap". This will swap the original and translated text; hence you can then proof the translated text.
- Close and restart Subtitle Workshop, and load the semi-final translation as the original.

Now we first need to set the options on what to check. You do this by selecting "Tools", "Information and errors", and "Setting".

I personally check everything, and auto-repair nothing. But feel free to adjust this to your own preferences.

Then start the actual check. You do this by selecting "Tools", "Information and errors", and "Information and errors". Fix all the errors, and save it as final.

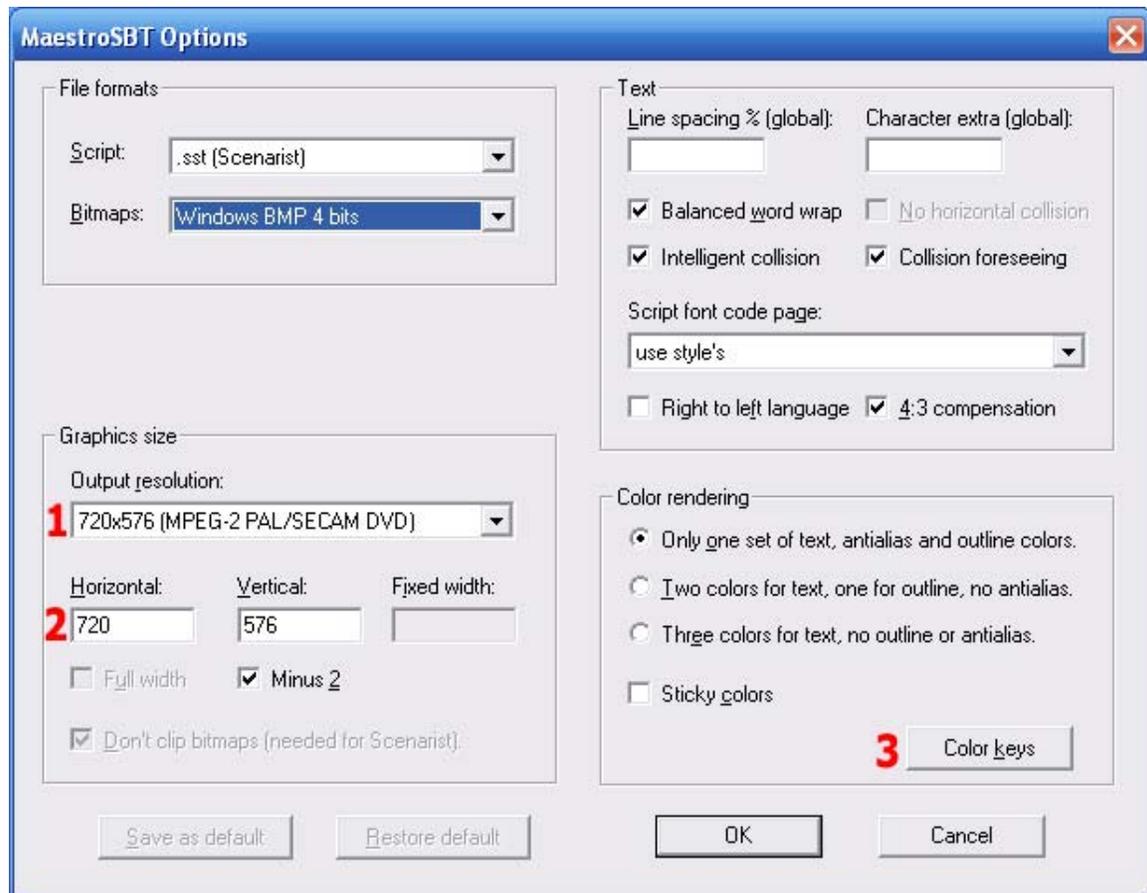
Chapter 4: Creating the new custom subtitle track

If we downloaded a subtitle in a different format the .ssa just convert it to .ssa with Subtitle Workshop. See chapter 3 for more information.

We begin by starting MaestroSBT. In the pop-up box select our final .ssa.

First, select the "Set Files" button. Press the top "browse" to select the output directory. Then press the "OK" button.

Back in the main screen, press the "Rendering" button.

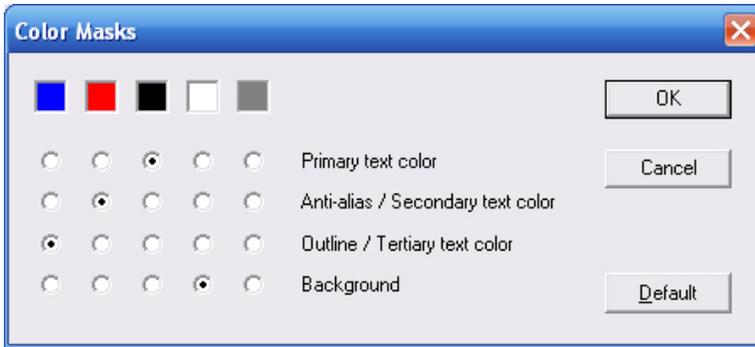


Match the above settings. The only thing you want to check is whether the original is PAL or NTSC. Match this in the drop-down menu (1) and make sure these values (2) match it.

For NTSC select 720x480 (MPEG-2 NTSC DVD)
For PAL select 720x576 (MPEG-2 PAL/SECAM DVD)

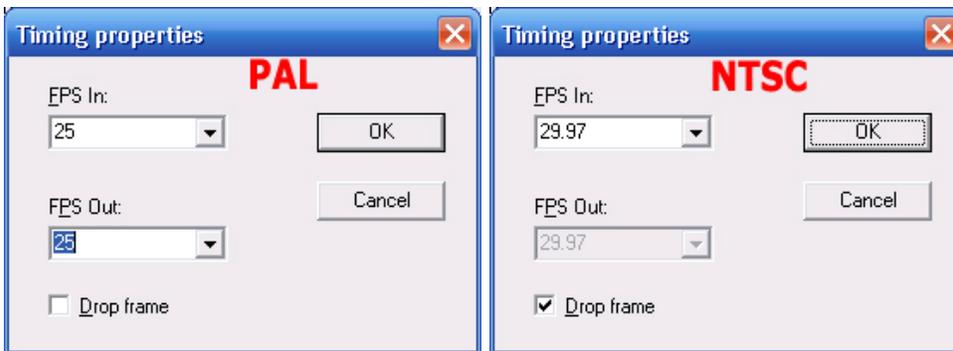
Note: Muxman only can handle 4-bit BMP's. For other muxing applications we would select "Windows (RGB)" from the drop-down menu.

Now press the "Color keys" button (3).



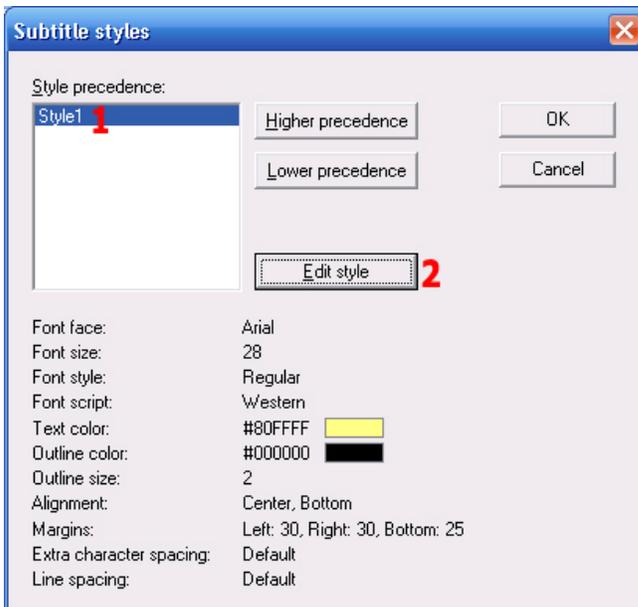
Match the above settings.

Press "OK" twice to return to the main menu.
In the main menu, press the "Timing" button.

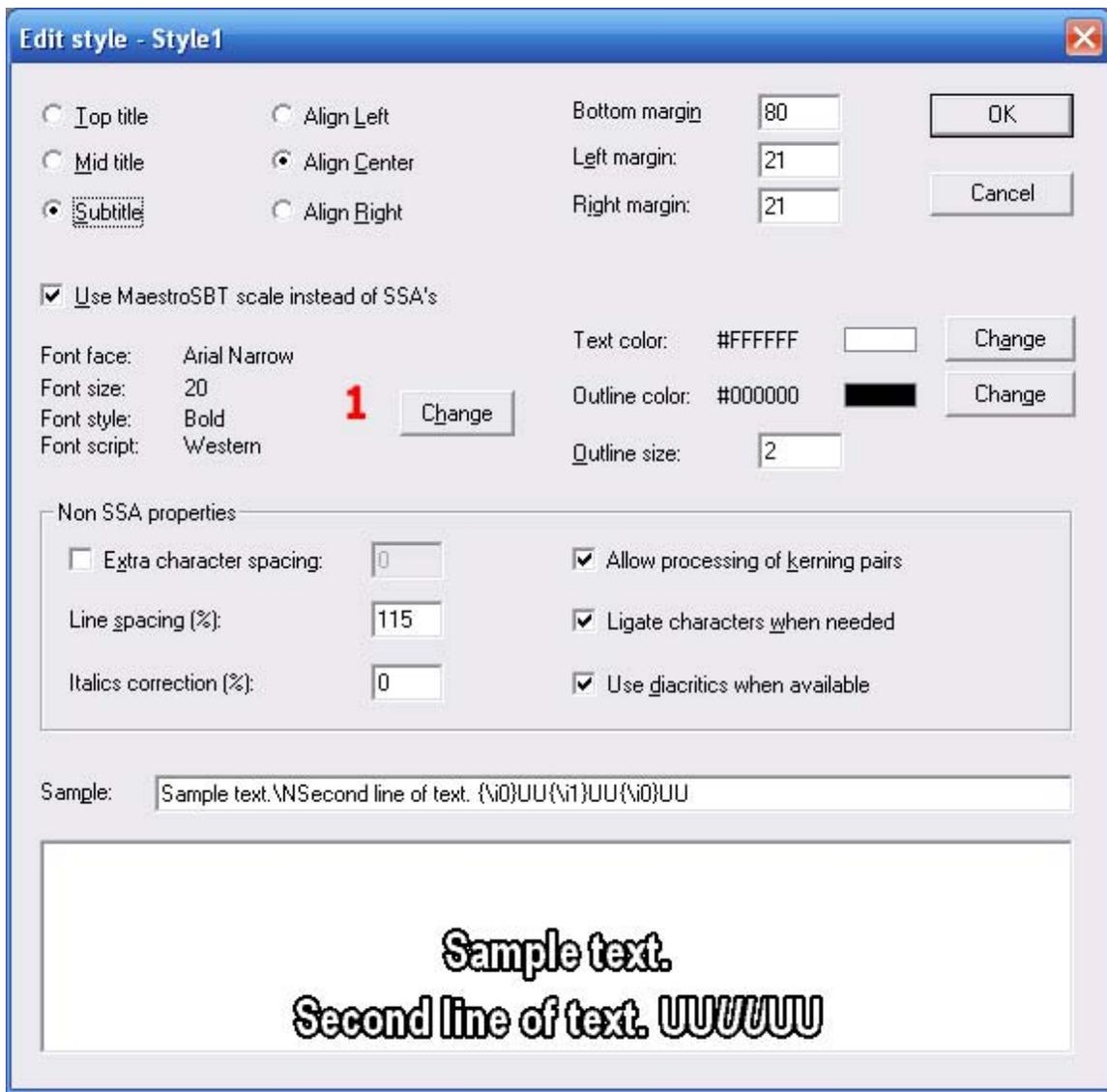


Match the above settings, depending on PAL or NTSC.

Press "OK" to return to the main menu.
In the main menu, press the "Styles" button.



First highlight "Style1" (1), and then press "Edit style" (2).



The screen you get now is all down to user preference. It's the look and placement of your subtitles. So I'll just paste an example for NTSC. The only difference between PAL and NTSC is the font-size (1).

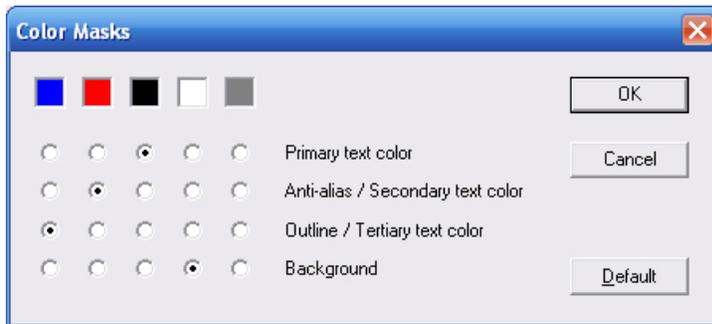
Press "OK" twice to return to the main menu.
In the main menu, press the "Generate" button.

This will finalize the generating process.

All we need to do now is save the used .ssa to a new .ssa which contains the MaestroSBT settings. This will save you the trouble of re-administering all the settings if something went wrong, as this .ssa will already contain all the settings. So we can use that as the source if something went wrong.

To save it, just select "File" and "Save", and use a different name.

Unfortunately, our color map references to the CLUT cannot be changed in MaestroSBT.



Although we can change which color is mapped to which subtitle type (black to primary text color), there is a fixed mapping from the subtitle type to the CLUT. The CLUT is the color table of the DVD. The colors are just used for .bmp generation. The muxing application then “reads” the color and maps it back to the subtitle types (black to primary text color).

Well, what's the problem...?

The MaestroSBT generated .sst is mapped to the CLUT in the following manner:

Primary text color	→ 1 with a contrast value of 15, which means it's solid
Anti-alias / Secondary text color	→ 2 with a contrast value of 15, which means it's solid
Outline / Tertiary text color	→ 3 with a contrast value of 15, which means it's solid
Background	→ 1 with a contrast value of 0, which means it's fully transparent. This also means it doesn't show.

The PGCDemux ripped .sup files are mapped in the following manner:

Primary text color	→ 2 with a contrast value of 15, which means it's solid
Anti-alias / Secondary text color	→ 1 with a contrast value of 15, which means it's solid
Outline / Tertiary text color	→ 3 with a contrast value of 15, which means it's solid
Background	→ 1 with a contrast value of 0, which means it's fully transparent. This also means it doesn't show.

Because we can't alter the .sup files we need to correct this in our .sst file.

Open your .sst in Notepad. Look up the following line:

```
SP_NUMBER   START END   FILE_NAME
Color (3 2 1 1)
```

Change that into:

```
SP_NUMBER   START END   FILE_NAME
Color (6 4 5 4)
```

Note: If you fail to do this step, you are not able to use the anti-aliasing feature.

Note: You could use 3 1 2 1, but then your added subtitle stream and your original subtitle stream always have to be the same color. This way the subtitle tracks have different CLUT mappings, and you can keep the English subs yellow, and the added subtitles white. Otherwise the subtitles are all yellow OR all white.

We also need to change the subtitle directory in the .sst file. Look for “Directory .” and change the “.” to the directory name. The line should look like: “Directory C:\subs”.

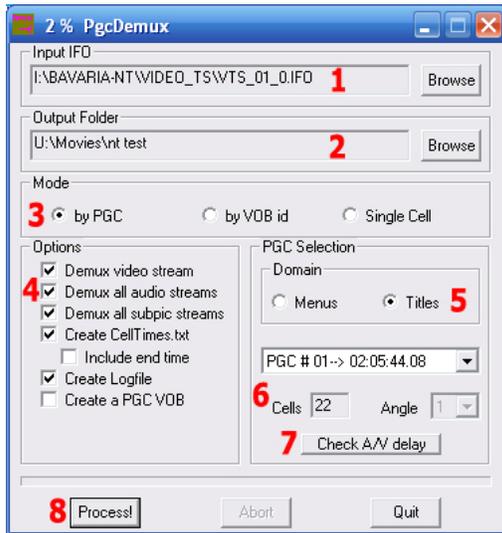
Just save your .sst.

Chapter 5: Collecting assets for the muxing process

In this step we will break down the original DVD into the building blocks we need, to reconstruct the DVD with our custom subtitle addition.

Basically we are going to break it down to independent video, audio, and subtitle streams.

We begin by starting PGCDemux.



First, we select the main movie IFO (1) and the output folder (2). Then we select the way we want to demux our movie (3).

The 3 options are:

- By PGC

This will only demux the used cells within the specified PGC. This is the preferred method, as this really narrows down what we need.

- By VOB id

This will demux **all** cells in this VTS. The order in which it demuxes the content is the same order of the cells in the VOB's. This can be used for multi-PGC discs, but we will give more in-depth information in the section on extra complicated discs.

- Single Cell

This will only demux a single cell. We have no use for it in this procedure.

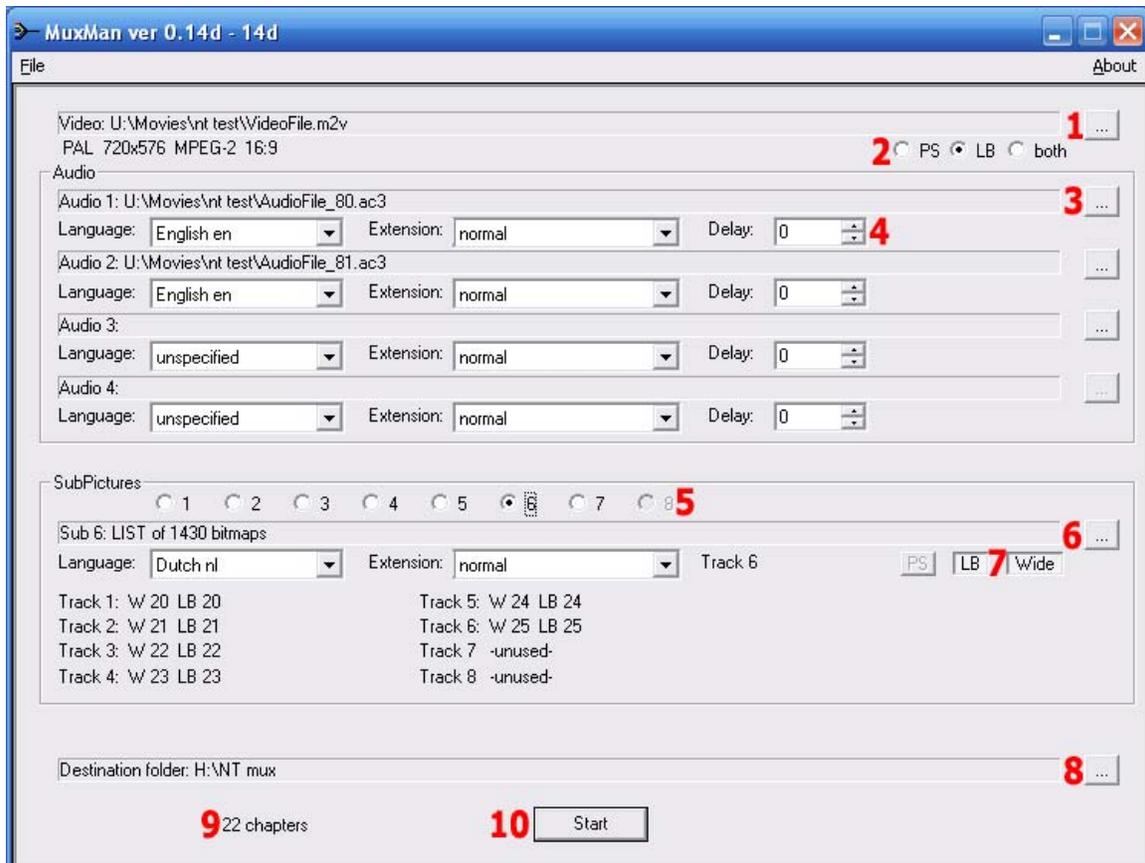
After selecting our demuxing method (3), we need to select what to demux. Just copy the settings at "Options" (4).

At "Domain" (5) we can select whether we want to demux the movie or the menu. In our case it's the movie, so we select "Titles". Next, we select the PGC we want to demux from the drop-down box (6). Just as a precaution, press "Check A/V delay" (7) to see if we need to administer some delays when remuxing.

All that is left is to press "Process!". Just wait for the demuxing to finish, and then we can move on to the next step.

Chapter 6: The muxing itself

We begin by starting Muxman. Make sure you use version 0.14d or above, otherwise the .sst isn't read properly, and you'll only get the outline of the subtitles.



First, load our demuxed video (1). After you've selected the file in the pop-up, you'll get a new pop-up. Just press "Close", and don't change any values.

Now set the correct aspect ratio (2). Most settings, including this one, don't matter as we won't be using the IFO's, just the generated VOB's.

Load the demuxed audio streams (3). Again, just press "Close". You can add labels (4), but this isn't necessary.

If the audio and video aren't sync after muxing, compensate by changing the delay (4).

Select the correct subtitle (5) and load the demuxed subtitle tracks (6). Set the values for each track (7).

With multiple tracks, move the radio button one step to the right (5) after the first track is added, and repeat the process. The final track you add will be your custom .sst we created. Select the output destination (8).

We haven't added the chapters yet. You will see "No chapters" (9). Select "File", and "Import chapter". In the pop-up select the "CellTimes.txt".

The chapter count (9) will now be updated.

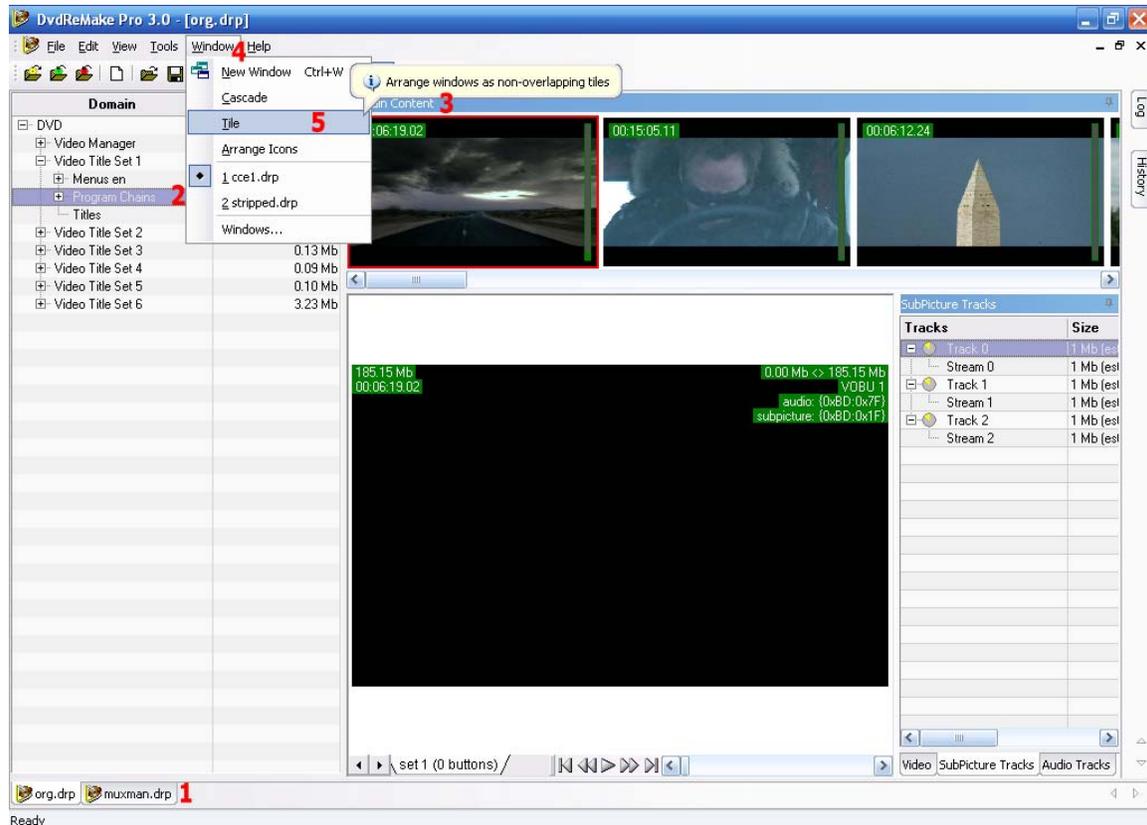
Press "Start" to begin muxing, and wait. Muxing will take some time, so be patient.

Chapter 7: Integrating the muxing output into the original movie

We begin by starting DvdReMake.

First we need to load the original movie and the muxing output. After each import, it is best to directly save the project. If for whatever reason we need to reload, it will speed up the process greatly.

So, first select "File" and "Import DVD". In the pop-up box select your original "VIDEO_TS.ifo". Wait until the import finishes, and then select "File" and "Save project". Do the same for your muxing output.



First, select your original project from the project tab (1). Then select your main movie

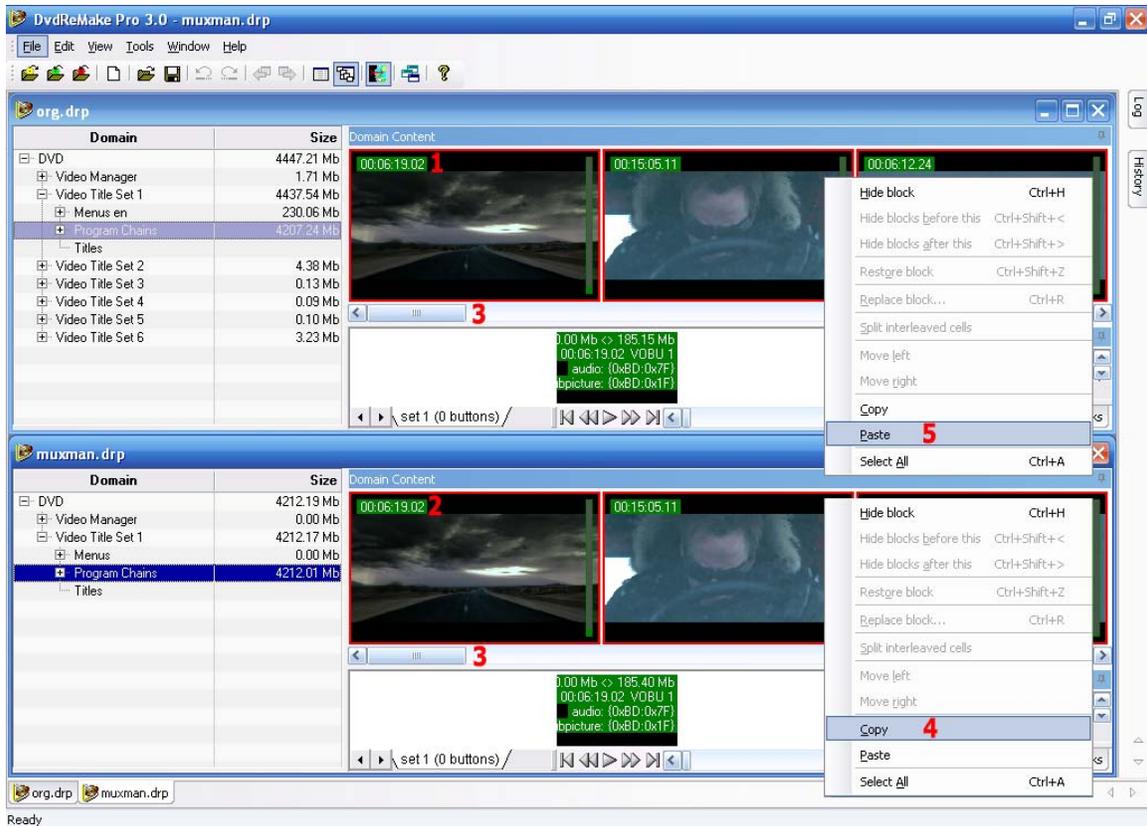
"Program Chains" (2).

You will now see the "Domain Content" (3) appear, which represent all starting frames of your chapters (which are in fact cells).

Switch to your Muxman project (1), and repeat the process.

Now, we need to select "Window" (4) and "Tile" (5).

The "Domain content" for both projects will now be shown on the same screen.



We need to check whether all of our chapter points in our muxing output matches the chapter points in the original.

So, we look at the original frame (1) and check if the playback time and the video content itself match in the muxing output frame (2). Just use the sidebars (3) to scroll to the right, so you can check all the cells. There might be a small mismatch between the frames if you have "Skip blank frames at blocks start" enabled. So, if you're not sure if the chapter-points match, and want to get a 100% accurate reading, disable it in the options.

If the cells don't match, well, then we're screwed. Then we'll have to manually compensate the frame numbers used for the chapters. There is no way to calculate them, so it's really a guessing game. On the bright side however, I still have to see a noticeable or disturbing mismatch between the chapters.

So, let's proceed to integrate the muxing output into the original movie.

There has been a new feature added which IMHO replaces the need for the 2 older replacement methods. Therefore, I will just focus on this new method.

In the screen above, we just need to select all blocks in our muxing output. By left-clicking cell 1 (2), and then left-clicking the last cell of the "Program Chain" while holding the "Shift" key on your keyboard (same as the Windows multiple copy), we select all the blocks in the "Program Chain". A red outline will indicate all the cells that are selected.

Next, right-click in any of the selected cells and select "Copy" (4).

Now we need to highlight the **matching** cells in the original movie in the same manner, right-click any of the selected cells, and select "Paste" (5). This will replace all content from the muxing output into the original movie.

So, let's proceed to administering the additional subtitle tracks.

Well, first let's recap what I have done. In my remux, I've added 2 director commentary tracks (that were initially stripped) and my custom Dutch subtitle track.



If you look at the original you'll see we have only 3 subpicture tracks (1).

If you look at the muxing output you'll see we have 6 subpicture tracks (2).

Also note that we are still working on the "Program Chains" level (3).

So, we need to add the additional 3 tracks.

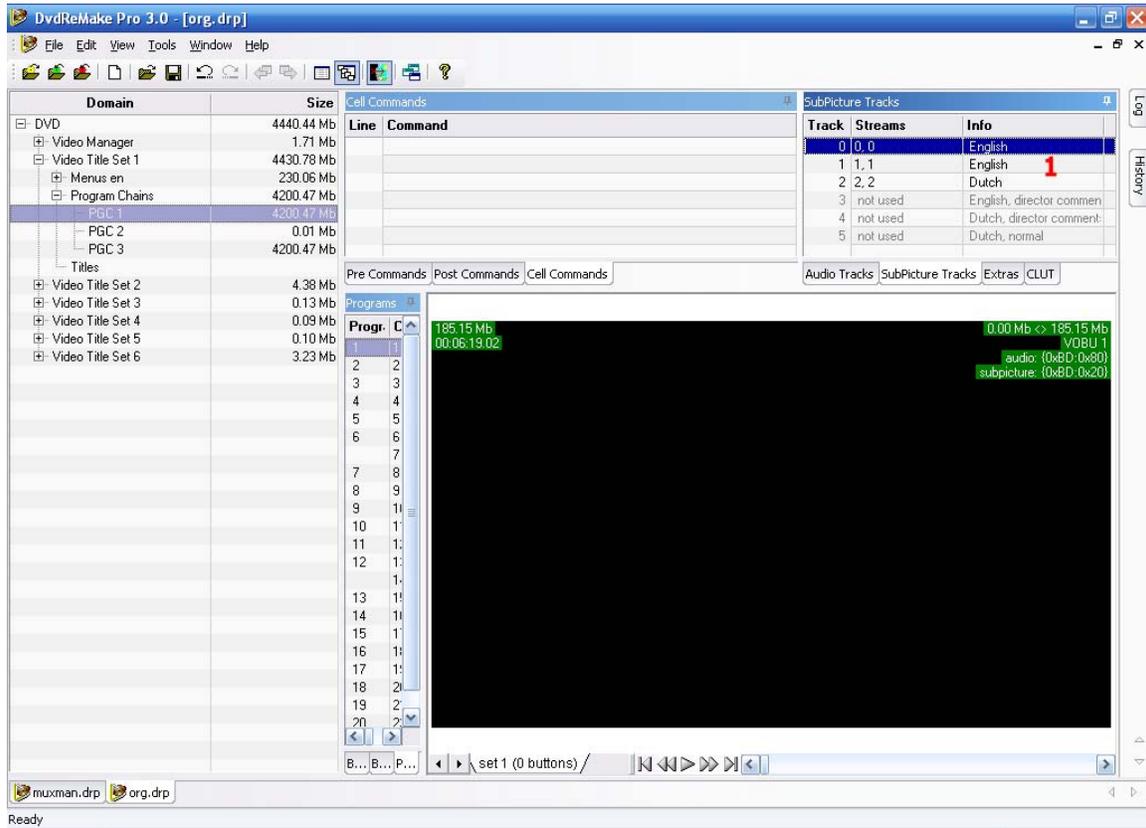
Right-click in the subtitle-track window of the original project (1) and select "Add track".



In the pop-up, administer the labels for the "Language" (1) and "Description" (2), and press "OK" (3).

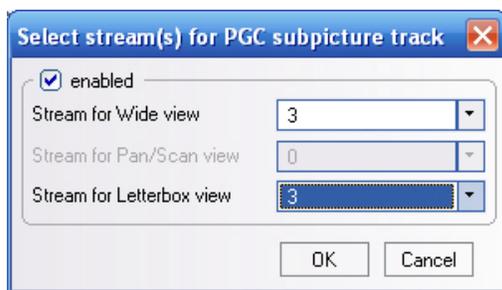
Repeat this process for all the subtitle tracks we need to add.

Next, we need to go down one level, to the PGC's.



If you look at the subtitle tracks (1) you'll see that the 3 added tracks are still grayed out. Well, that's what supposed to happen. We have only told the disc that there are extra subtitle tracks available, now it's time to link them to the content.

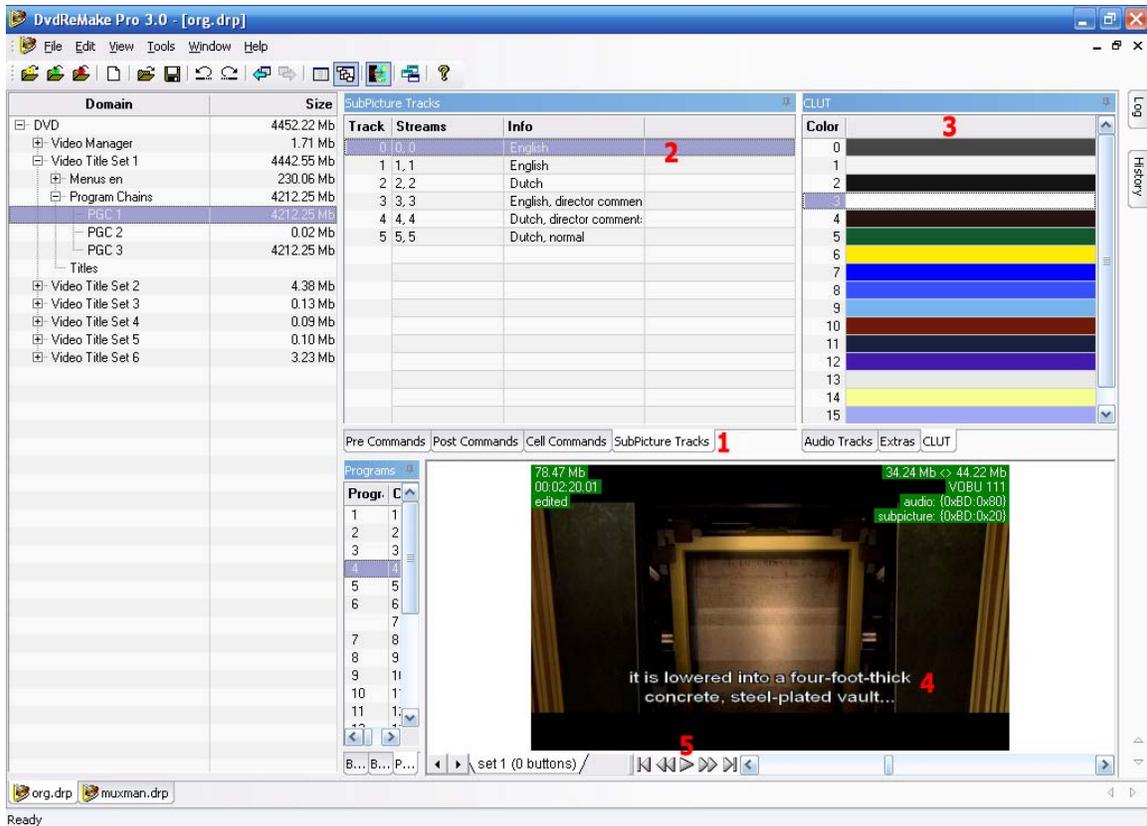
Just double-click one of the grayed out tracks.



Check the enabled box, and administer the correct stream mappings.

Note: The availability of the stream mappings depends on the video content. Hence, in this case "Pan/Scan view" is grayed out.

After administering the subpicture streams, we can move on to altering the subtitle colors.



For reference, I've changed my layout a little. I dragged the "Subpicture Tracks" tab to a different locking position (1), so I can play around a little easier.

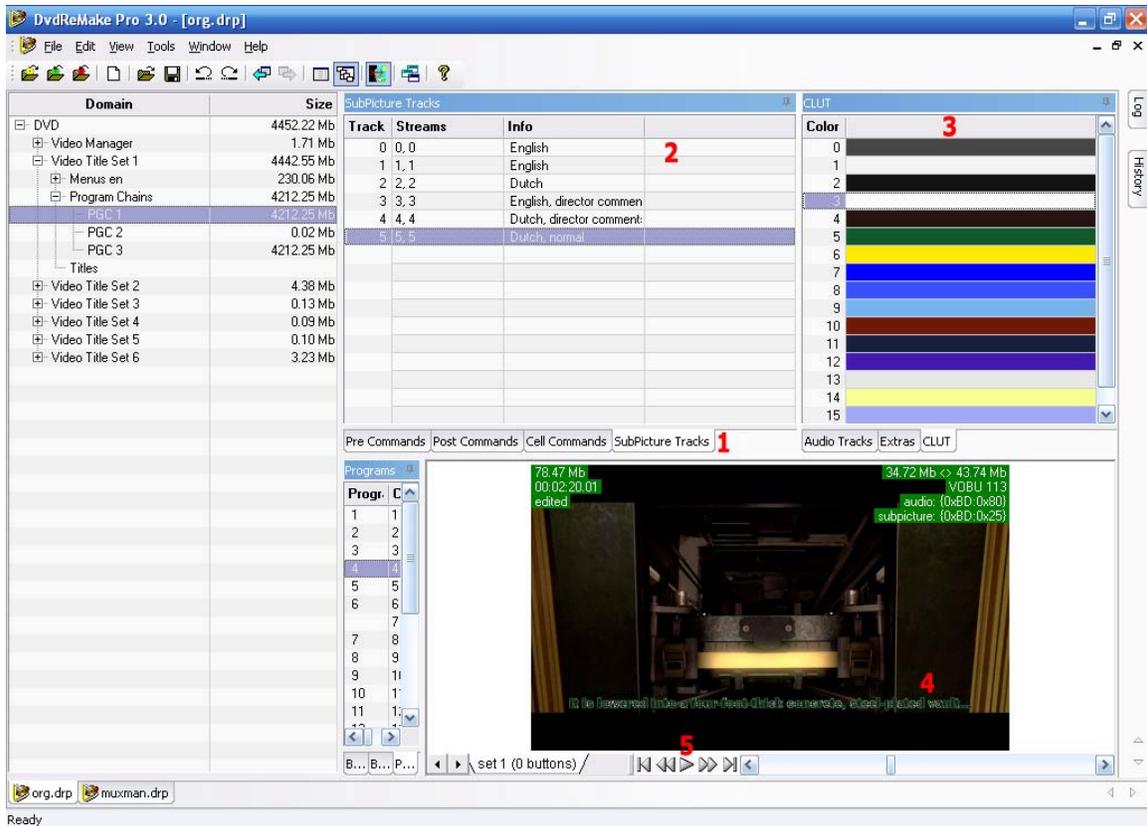
I've selected subtitle track 0 (2) for playback.

Remember when I said our .sup files use color 1, 2, and 3? Well, these colors are mapped in the "CLUT" (3). However, DvdReMake counts from 0-15 instead of 1-16, so it is using colors 0-2 in the "CLUT" (3).

As you can see, playback color for the subtitle is perfect (4).

To display the subpicture track, just press the "play" button (5) to check them during playback.

Now let's check on my custom track.



I've selected subtitle track 5 (2) for playback.

Remember when we changed our .sst so it uses color 4, 5, and 6? Well, these colors are mapped in the "CLUT" (3). However, DvdReMake counts from 0-15 instead of 1-16, so it is using colors 3-5 in the "CLUT" (3).

As you can see, playback color for the subtitle is wrong (4). This is because the "CLUT" (3) entries 3-5 were never used, so they just contain random values.

Again, to display the subpicture track, just press the "play" button (5) to check them during playback.

So we need to correct our "CLUT" (3) entries. We can either change a color by just clicking on it, or we can export the "CLUT" (3) to a file, and change it in WordPad.

Since I like the colors used on the standard subs, I'm just going to reuse those. As I can't copy colors, I need to export, change, and re-import the "CLUT" (3).

Just right-click on the "CLUT" (3) and select "Export".

Open the ".clt" file in WordPad.

A ".clt" file will look like:

```
{
  { 77 , 128 , 128 }
  { 225 , 128 , 127 }
  { 34 , 128 , 128 }
  { 234 , 128 , 128 }
  { 38 , 136 , 125 }
  { 71 , 100 , 120 }
  { 200 , 153 , 24 }
  { 40 , 109 , 240 }
  { 95 , 105 , 206 }
  { 161 , 97 , 163 }
  { 59 , 167 , 108 }
  { 46 , 122 , 143 }
  { 64 , 135 , 187 }
  { 217 , 128 , 127 }
  { 222 , 132 , 82 }
  { 166 , 119 , 163 }
}
```

This is just a list of RGB references. So all we need to do is copy the references for 0-2 over 3-5.

The final ".clt" file will look like this:

```
{
  { 77 , 128 , 128 }
  { 225 , 128 , 127 }
  { 34 , 128 , 128 }
  { 77 , 128 , 128 }
  { 225 , 128 , 127 }
  { 34 , 128 , 128 }
  { 200 , 153 , 24 }
  { 40 , 109 , 240 }
  { 95 , 105 , 206 }
  { 161 , 97 , 163 }
  { 59 , 167 , 108 }
  { 46 , 122 , 143 }
  { 64 , 135 , 187 }
  { 217 , 128 , 127 }
  { 222 , 132 , 82 }
  { 166 , 119 , 163 }
}
```

Just save the ".clt" file, and return to DvdReMake.

In DvdReMake, just right-click on the "CLUT" (3) and select "Import".

The "CLUT" will now be altered, and we can check the playback colors.

If the playback colors are correct, all that is left to do is to export the disc and test it in our stand-alone player.

Chapter 8: Extra complicated discs

So, first let's give a couple of examples of what can be considered an extra complicated disc...

- Discs which had Arcross protection.
- Discs like "The Forgotten" where there is an extended version on the disc, but it uses the same video content as the normal version does, except the extended parts.
- Multi-VTS/PGC episodic discs (mostly TV-shows).

Let's start of with the Arcross protected discs, as this is something we can encounter on any type of disc. Although the newer ripping tools have improved the way they handle these discs you might encounter a disc with Arcross residual blocks.

Arcross protected discs

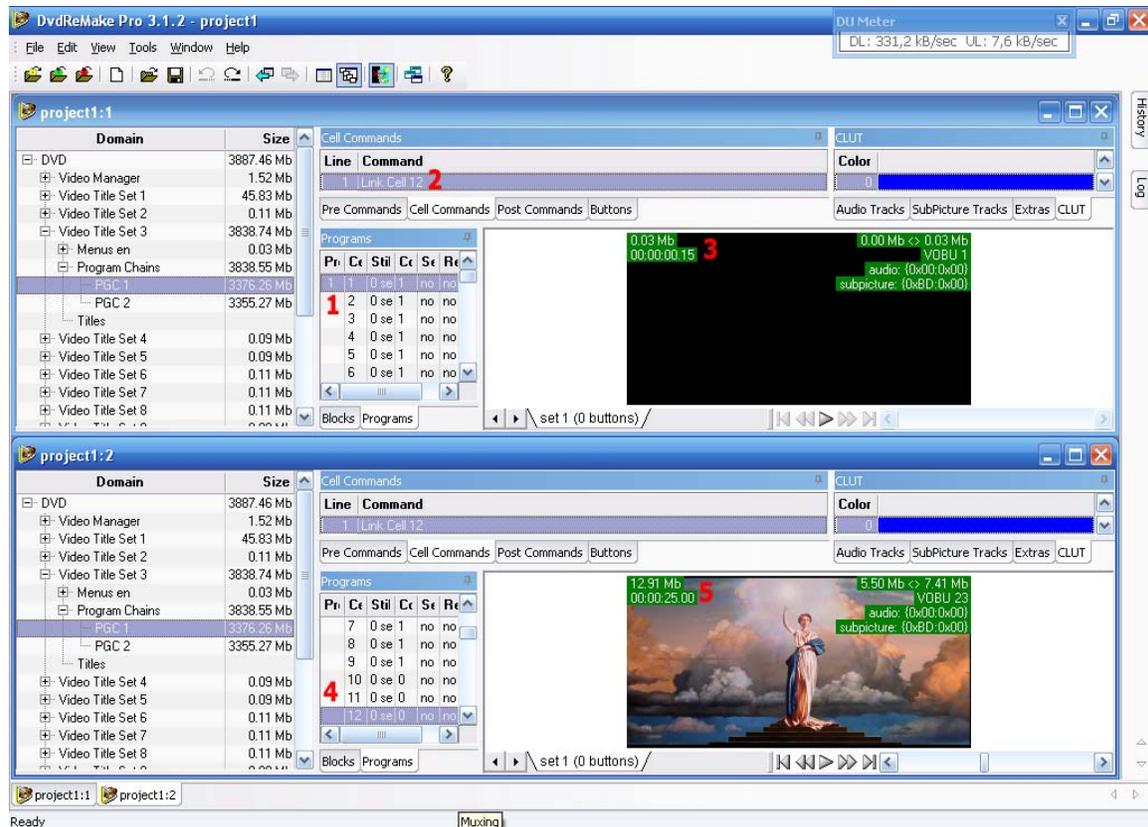
Arcross works by adding bad blocks onto a disc, which in case you try to backup your disc, will cause corruption and render the disc unplayable.

What the older ripping tools did was replace these corrupted cells with blank cells. But since these cells are still slightly corrupted, they can cause audio/video timing mismatches.

So, how do I recognise a Arcross protected disc?

Well, luckily it has a pretty unique signature. The first cells will appear as blanked cells. The first cell to actually contain video content will vary per disc, so I can't give you an exact number.

Mostly there will be a cell-command added to the blanked cells linking them directly to the first cell which contains actual video content. For reference see the screenshot of "The Forgotten" below.



When we look at the disc, we see that cell 1 to 9 have cell command 1 assigned (1 and 4). Cell command 1 (2) tells us it links to cell 12. This immediately tells us that this will be our first cell that contains actual video content.

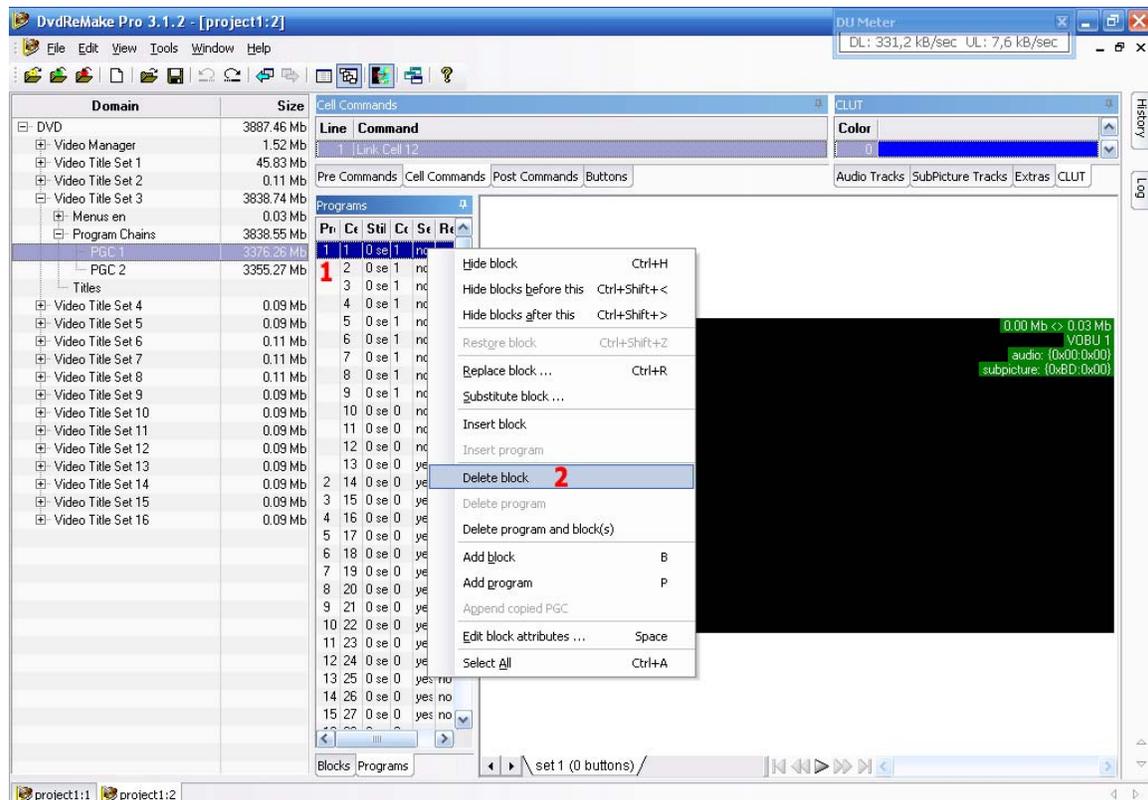
When selecting cell 1 (1), we see it has a playback-time of 00:00:00:15 seconds (3) Don't ask me why cell 10 and 11 don't have cell command 1 assigned (4), since I just don't know. But it really doesn't matter, as they have no program assigned, and therefore you can only get there through cell 9, which jumps to cell 12. So cell 10 and 11 will never get played, and therefore don't really need cell commands.

When we look at cell 12 (4), we see that it has a playback-time of 00:00:25:00 and actually contains video content.

So, what do we do to fix this?

Well, it's rather simple. We need a version without these corrupted cells, so we can just demux the disc like normal.

To get rid of the Arcross blocks, just open our work "PGC", and use "Delete Block" on every cell, working your way down from 1, until you reach a cell that actually contains video-content. Never ever touch these Arcross blocks in your **original** main movie VTS. Deleting or hiding the Arcross blocks will render the disc useless. We can only do this for the export we use for the demuxing.



If the disc is Arcross protected, always remember to never paste anything into the Arcross blocks when integrating the muxing output into the original.

Now that we have discussed the do's and don'ts for Arcross protected discs, let's move on to extended version discs.

Extended version

So, what is the biggest problem with these discs? Well, it's rather simple. The video-content we want to use resides in multiple PGC's. As this would require multiple muxes, we want to be able to do this with ease. Luckily, DvdReMake provides us with a simple solution...

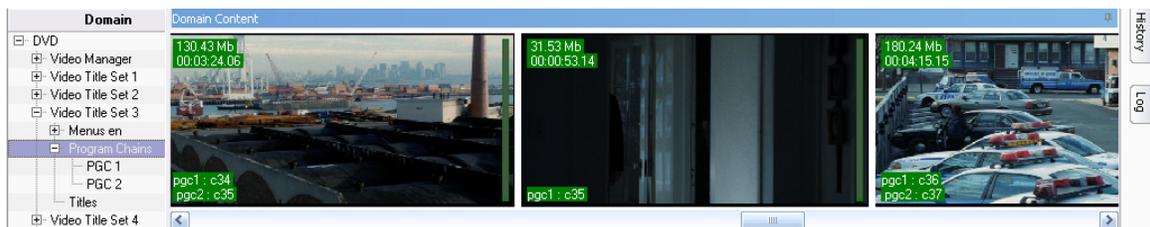
I did say the solution was simple, I didn't say the procedure was. It's very basic work, and once you have done it once or twice, it shouldn't be a problem. The first time can get a little overwhelming, but hey, they aren't called extra complicated disc for nothing.

What it comes down to, is that we need to convert the disc into a single PGC first, before we start chapter 2. I will demonstrate how to do this by using "The Forgotten" as a reference.

So, let's take a look at the DVD-structure of "The Forgotten".

If we take a look at VTS 3, we'll see that PGC1 is the standard version, and PGC2 is the extended version.

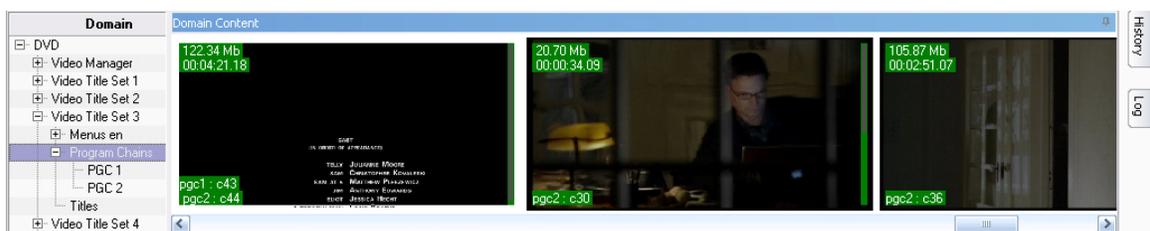
If you look at the "Program Chain" level, you'll see some cells are used by PGC1 and PGC2 (shared cells), others just by either PGC1 or PGC2 (unique cells).



If you look at the left cell, you'll see that it is used for cell 34 in PGC1 and cell 35 in PGC2. The centre cell shows that it is only used for cell 35 in PGC1. The right cell shows that it is used for cell 36 in PGC1 and cell 37 in PGC2.

So, why isn't there a cell 36 in PGC2?

Well, of course there is, it's just the way the disc is authored. They have placed all content for PGC1 on the disc first, and then added content for PGC2. So we need to look at the last cells.



See, there it is. The right cell is used for cell 36 in PGC2. Also, the centre cell is used for cell 30 in PGC2. It's the first bit of added content in regards to PGC1, so that's why all cell-numbering starting with cell 30 will not match between PGC's.

What a structure like this means, is that PGC1 and PGC2 share a great deal of video content.

Making 2 separate muxes of PGC1 and PGC2 is impossible, as it will be 2 unique movies, and not 2 movies which share video content. And besides, who wants to make 2 muxes...

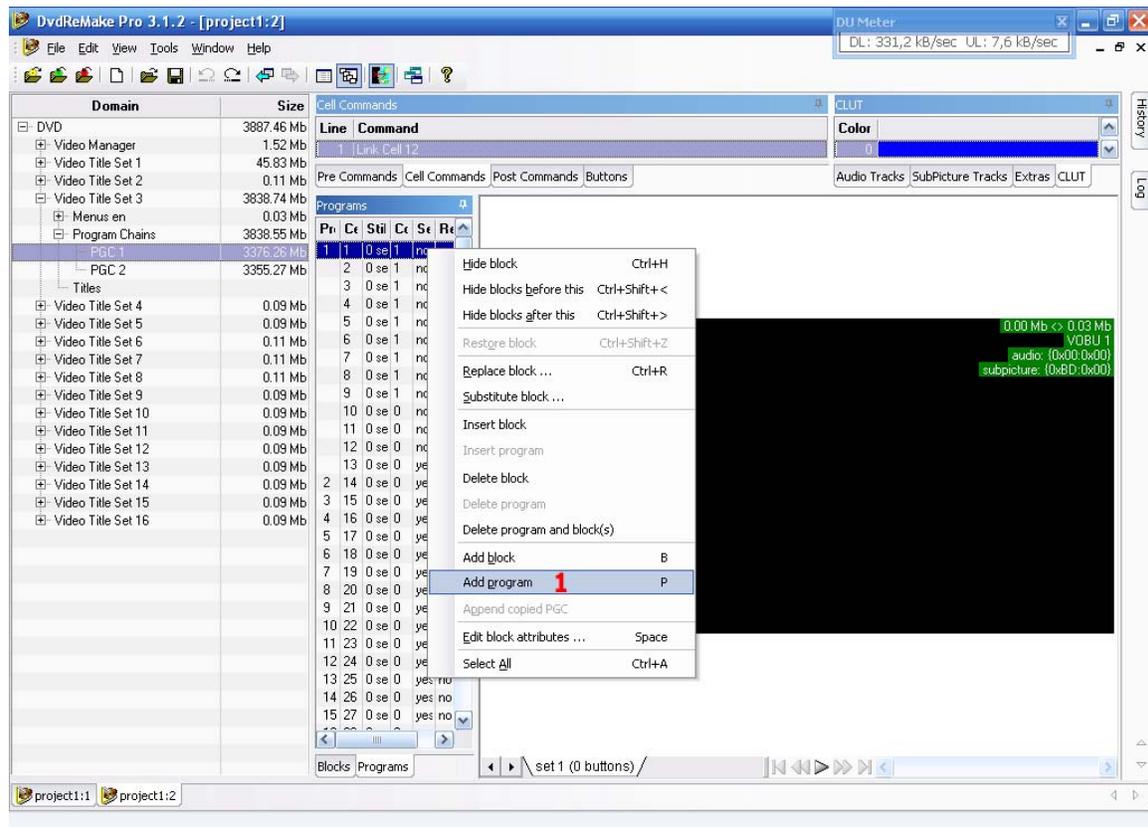
What we want to achieve is that our demux contains **ALL** main movie content (both unique as shared).

The quick and dirty way is to demux the disc using VOB id, but we will get the **ALL** the content of **ALL** the PGC's in the main movie VTS. This can also contain content we don't want.

The clean way of doing it, is by adding all the PGC2 specific video content to the end of PGC1. This will create a single PGC that contains **ALL** content (both unique as shared).

*So, how do we combine **ALL** main movie content into a single PGC?*

First, at the "Program Chain" level, we count the number of PGC2 specific cells. Remember, these cells will normally be on the right far end side.



In the "Programs" tab of PGC1, right click, and select "Add Program". Repeat this as many times, as there where unique PGC2 cells. In this case, I've got 6 cells which are unique to PGC2. So in my case, that would mean I need to add 6 programs.

Now, we need to copy the 6 cells into the new 6 blanks cells. We do this by using the same copy/paste method as discussed in chapter 7.

After we have done this, the copied cells are located twice on the disc (once in PGC2, and once in PGC1). Since we just changed PGC1 to contain **ALL** content, we can just delete PGC2, by right-clicking on it, and selecting "Delete PGC".

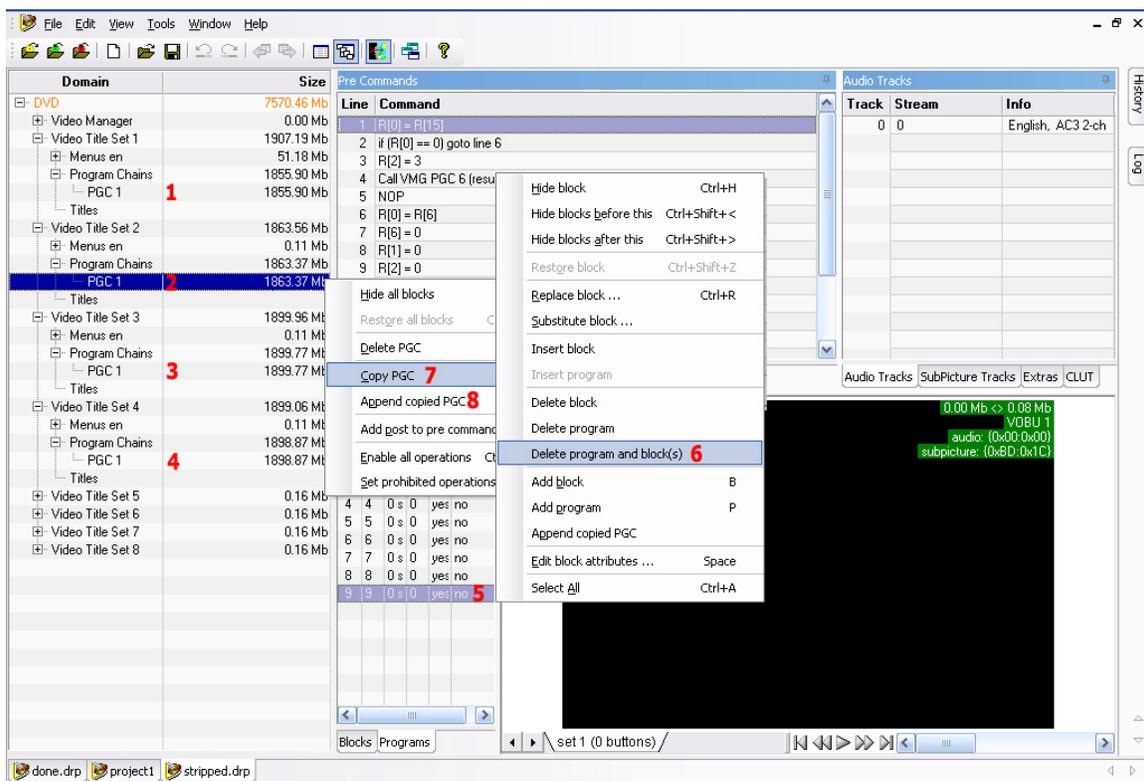
From this point on, we can just demux and process the discs as usual. Copying the muxing output back into the original movie is also the same as with a normal disc, so take a look at chapter 7 on how to do that.

Just remember that you need to reload the original disc into DvdReMake (to reverse everything we destroyed during the prepping process). If the disc is Arcross protected, always remember to never paste anything into the Arcross blocks. So again, never ever touch the Arcross blocks in your final main movie VTS.

Well, that wasn't so hard now was it? So, let's move on to our final type of complicated discs I will address.

Multi-VTS/PGC episodic discs

The thought behind it is exactly the same as for extended version discs. We first need to convert the DVD-structure back to a single PGC. So, let's take a look at Monsters Garage, which is a multi-VTS episodic disc.

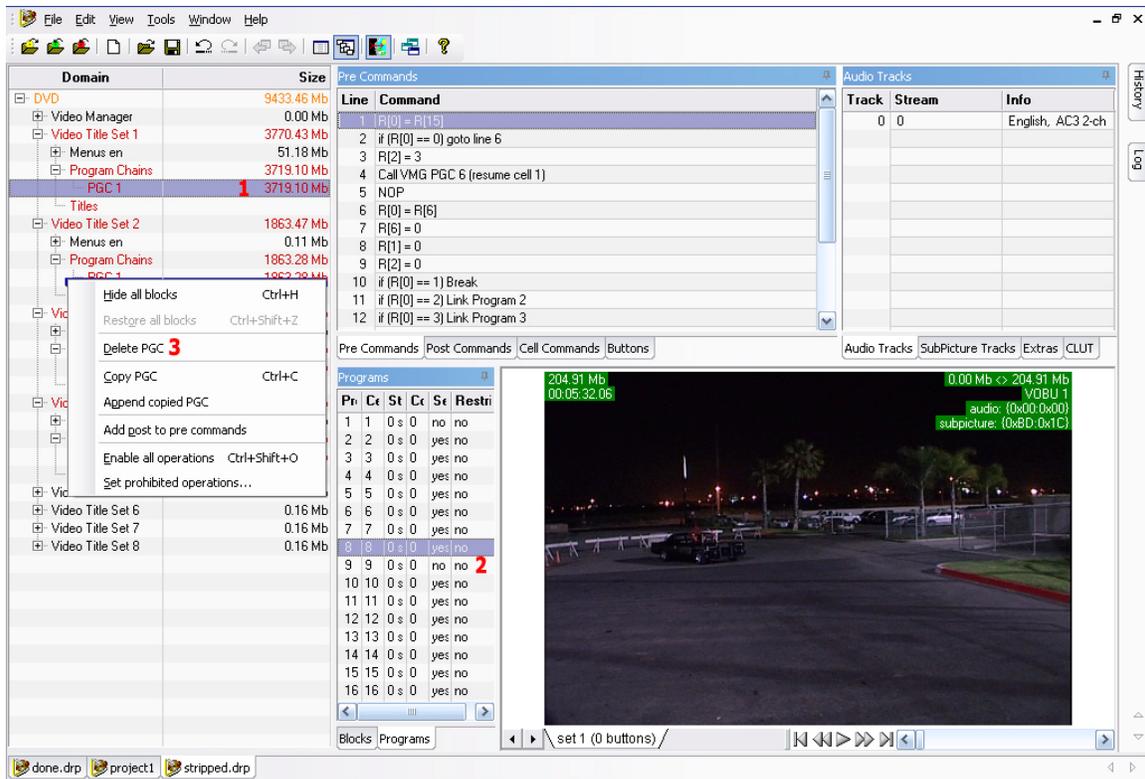


When we look at the disc we have our 4 episodes (1, 2, 3, and 4).

When examining the disc a bit closer, we notice that cell 9 (5) of every PGC contains a blank cell. We don't want to subtitle a blank cell, so we remove cell 9 (5) for every PGC by right-clicking on it, and selecting "Delete program and block(s)" (6).

Next, we right-click on the PGC for the second episode (2) and select "Copy PGC" (7). Then we right-click our first episode PGC (1), and select "Append copied PGC" (8).

We will now get the following situation.



Just ignore all the DvdReMake warnings.

After we have appended the second episode, we will see that the PGC size of episode 1 has doubled (1).

If we open the PGC, and look at the cells, we will see that we now have 16 cells instead of the original 8 (2), because the second episode is appended after the first episode.

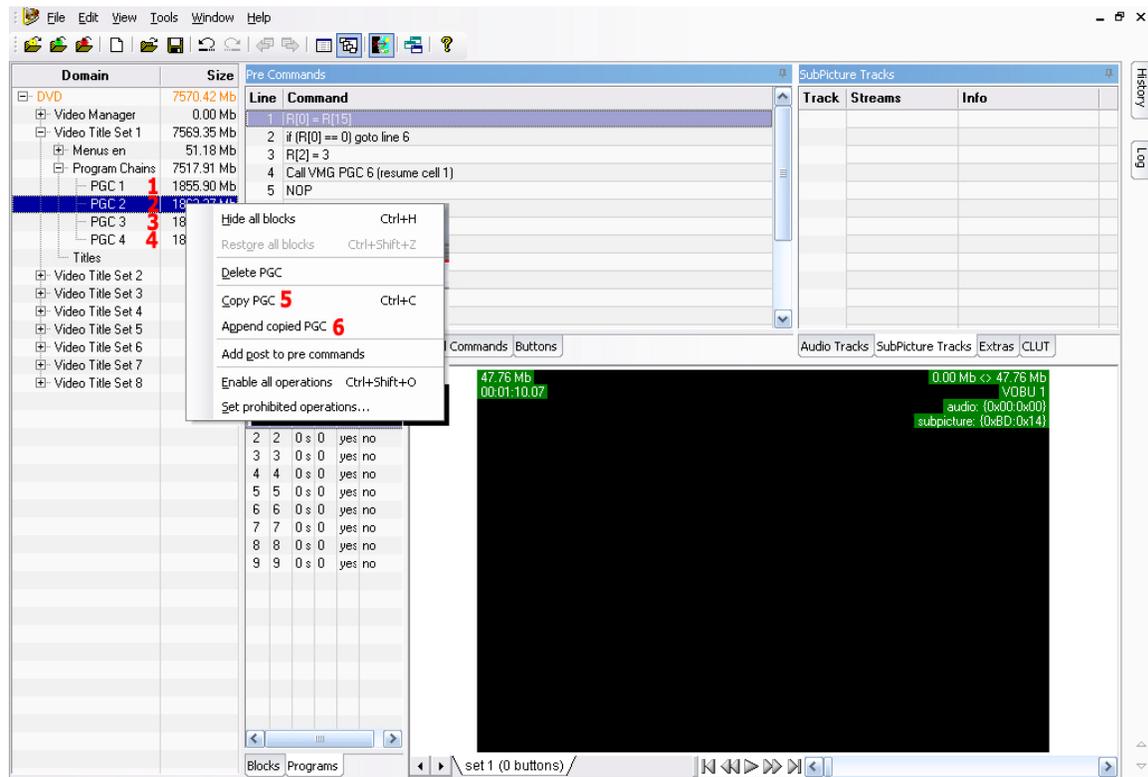
Repeat the append process for the other episodes, and when done, right-click on the copied PGC's, and select "Delete PGC" (3). Do **not** delete the PGC of episode 1 (1), because this now contains all 4 episodes.

We need to delete the original PGC's because otherwise every episode (except the first) will be on the disc twice. Once in the PGC of episode 1 (which now contains episodes 1, 2, 3, and 4) and again in it's original PGC.

We can now export the disc, demux, and process the discs as usual.

Copying the muxing output back into the original movie is also the same as with a normal disc, so take a look at chapter 7 on how to do that. It only differs slightly in the fact that you cannot copy all content at once, but need to do it per VTS.

A multi-PGC episodic disc is basically handled in the same manner, but I'll just show you it as well. To demonstrate the procedure, I've converted the Monsters Garage disc from multi-VTS to multi-PGC.



When we look at the disc we have our 4 episodes (1, 2, 3, and 4).

Because all the video content resides in a single VTS, we could again choose to demux the disc by VOB id with PGCDemux instead of converting it back to a single PGC.

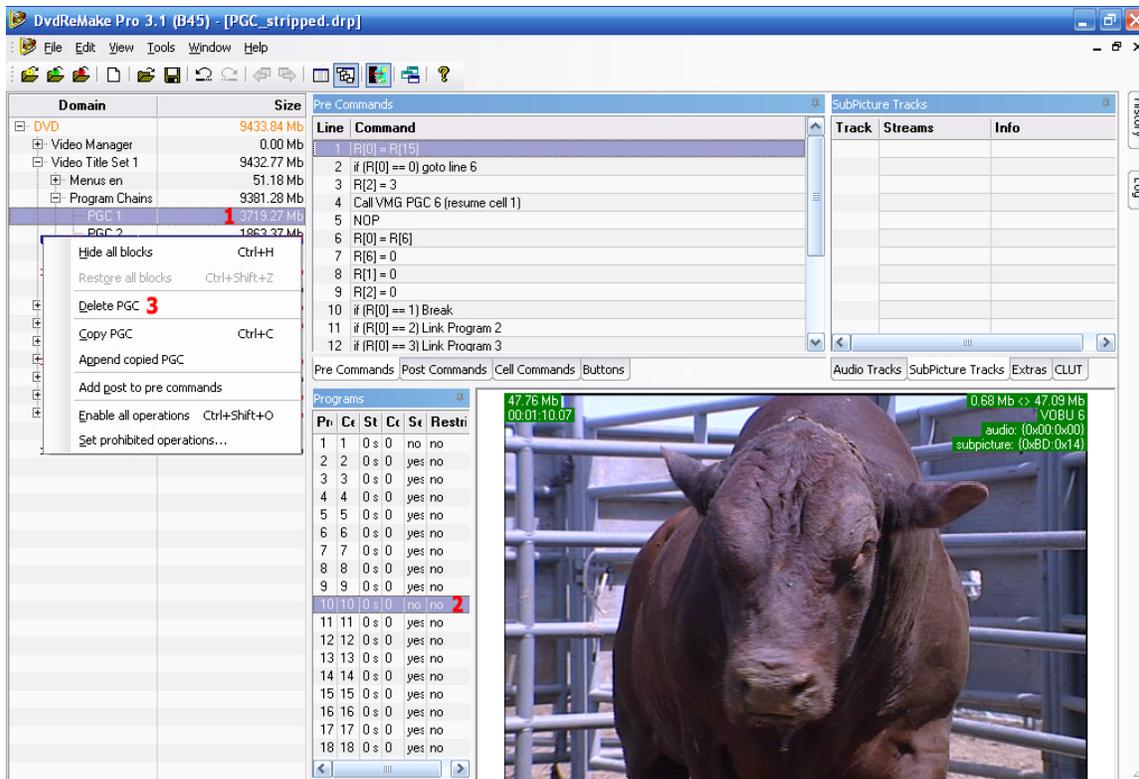
Normally, we would have deleted all the blank cells (cell 9 in every PGC), but I forgot to do that when making the screenshots. It's no big issue if you forget to remove them, but subtitling a blank cell is unneeded.

You can remove the cell by right-clicking on it, and selecting "Delete program and block(s)".

After deleting the cells, we right-click on the PGC for the second episode PGC (2) and select "Copy PGC" (5).

Then, we right-click our first episode PGC (1), and select "Append" (6).

We will now get the following situation. Just ignore all the DvdReMake warnings.



After we have appended the second episode, we will see that the PGC size of episode 1 has doubled (1).

If we open the PGC, and look at the cells, we will see that we now have 18 cells (16 if you removed the blank cell on every PGC) instead of the original 9 (2). This is because the second episode is appended after the first episode.

Repeat the append process for the other episodes, and when done, right-click on the copied PGC's, and select "Delete PGC" (3). Do not delete the PGC of episode 1, because this now contains all 4 episodes.

We need to do this, because otherwise every episode (except the first) will be on the disc twice. Once in the PGC of episode 1 (which now contains episodes 1, 2, 3, and 4) and again in it's original PGC.

We can now export the disc, demux, and process the discs as usual.

As you can see, even the more complicated disc can be handled with relative ease. All the "hard" parts are tackled in DvdReMake, which keeps muxing these types of discs really low-level and do-able by the average Joe.

Guess that's about it; the rest is up to you...

Don't hesitate to comment on this guide, whether its questions, remarks or suggestions, they are all welcome.