



v2.70a

super-quick start

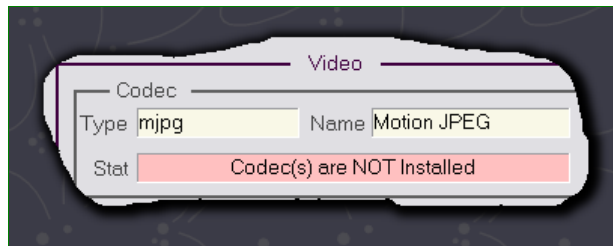
0. My video doesn't play - how do I use GSpot?

1) Download the latest [GSpot zip file](#), and extract the four files inside of it. If you don't know what a "zip file" is, ask a friend.

2) There is no "install". Simply double click on "gspot.exe" (one of the four extracted files) to run GSpot

3) Use the "File > Open" menu item (or just drag and drop) the unplayable file so that GSpot will be able to examine it.

4) If you see a message like the one at the right, you need to install a "codec" so that Windows Media Player can understand the file and play it. Codec downloads are not available at this site, but a simple Google search (e.g. "mjpg codec" or "Motion JPEG codec" for the example at right) should do the trick.



5) Download the appropriate codec and run its "install" or otherwise follow the instructions provided.

6) This will "upgrade" your system so that Windows Media Player (and/or other players you may have) will now play the file correctly.

Other notes

1) Audio problems: Examine GSpot's "Audio" section & perform the same procedure above - you may have the proper "video codec" but need to download and install an appropriate "audio codec".

2) Unusual file formats or corrupt files: Also pay attention to any understandable information in the "Container" section as well. This box may include messages about unusual file formats or may inform you that your file is corrupt in some way.

Alternative Media Players

Another solution is to download a media player like [VLC](#) or [MPlayer](#), which don't use "codecs" at all in the conventional sense; they are all "built in". MPlayer is a bit more technical, but VLC is quite easy to install and use. Simply download and install the one of the alternative players and use that to watch your file. Note that, unlike codec downloads, these will NOT help you solve Windows Media Player (or other media player) problems; they simply represent a completely alternative way to watch your movie file. This may sometimes represent the simplest solution for complex situations.

Additional Help

There is no additional help built into the GSpot app or available on this website at this time, although such help is "in the works". If you need additional help about GSpot itself, please try a quick Google search, as many sites discuss the app as well as solving related multimedia viewing problems.

GSpot v2.60 RC01: vsshort-for-edit

File System Options Tables Help

File

Path: C:\GTest\vsshort-for-edit.mpg

Size: 28.9 MB (or 29,618 KB or 30,328,836) 1/1

Container

MPEG-2 Program Stream << { 1 vid, 1 aud }
 Sys Bitrate: 3443 kb/s VBR

User Data / Metadata

[USER] encoded by TMPGEnc (ver. 2.53.35.130)

Audio

Codec: MPEG-1 Layer 2

Info: 0xc0:48000Hz 384 kb/s tot, Stereo

Stat: Codec(s) Installed

Proposed Codec Solutions and Tests

GSpot	MS	
Vid	Aud	A/V
1	1	1
2	2	2
3	3	

(Src)->-(A)->[PP MPEG-2 Splitter]->-(B)->[MainConcept MPEG Video Decoder]->-(C)->[Vid]
 Status: not rendered yet. Use [2] to render

(Src)->-(A)->[CyberLink TL MPEG-2 Splitter]->-(B)->[MainConcept MPEG Video Decoder]->-(C)->[Vid]
 Status: not rendered yet. Use [2] to render

(Src)->-(A)->[PD TLM2Spiter.ax]->-(B)->[MainConcept MPEG Video Decoder]->-(C)->[Vid]
 Status: not rendered yet. Use [2] to render

Video

Codec: MPEG2 Name: MPEG-2

Status: Codec(s) are Installed

AVID: NVOP PUOP BVOP GMC: 1700 POC 1470
 PB DF OPFL: 8170 8240

IPBS: 8% 30% 62%

2 max N=13 (99%)

Len: 1:10.360 Frms: 1,759 kbps: 3004 Qf: 0.290

Pics/s: 25.000 Frames/s: 25.000 Fields/s: 50.000

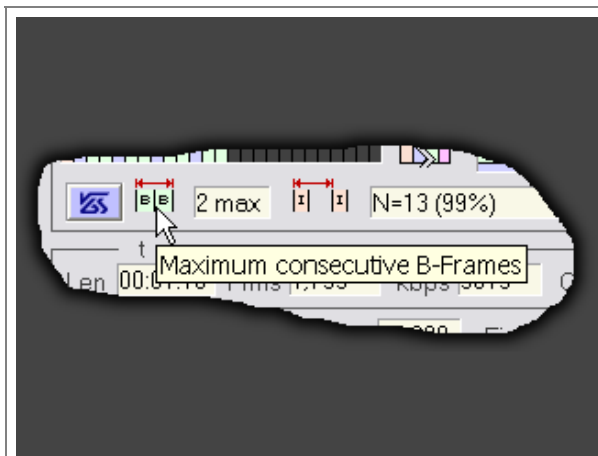
Pic (w x h): 720 x 576 SeqExt: 720 x 576 4:3 16:9

SAR: 1.250 (5:4) PAR: 1.067 DAR: 1.333 (4:3)

Resizing: + AVI - VCD SVCD DVD CVD

1 None, already DVD format 4:3 16:9

2 None, already DVD format info

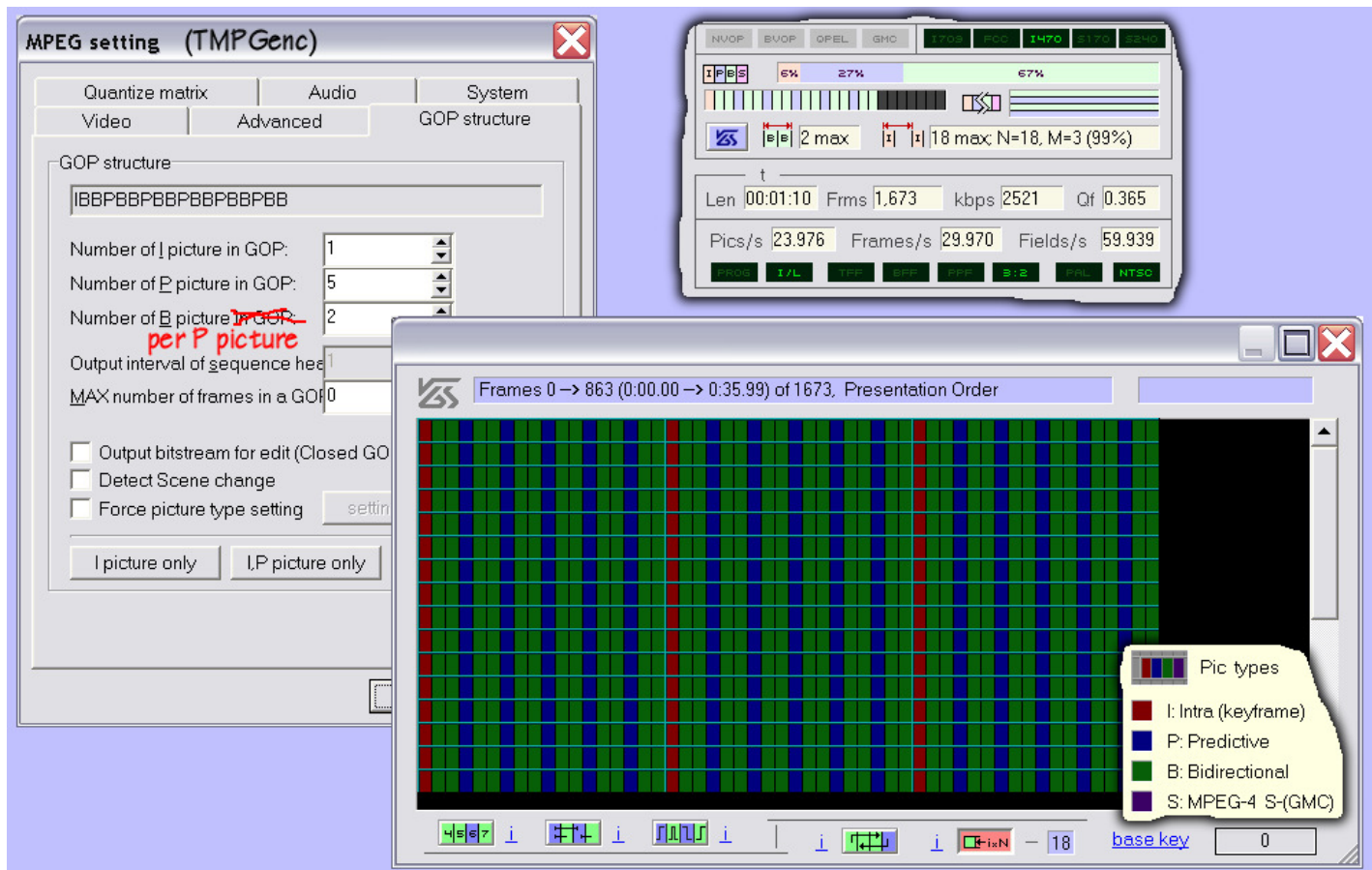


Above is the main GSpot dialog. Unlike the VGS Subsystem (shown in other screenshots), there is currently no specific detailed help available - either within the program or on the website here - for all the different fields. This will be taken care of in a later version of GSpot, or at any rate, a later version of the website.

For now, simply note that every field (and its corresponding label) should give you at least a basic description of what it is. For example, in the image to the left, if the cursor is placed over either the "B|B" label or the field itself to its immediate right, the phrase "Maximum Consecutive B-frames" appears. For now that will have to do.

As an aside, notice the small VGS button to immediate left of the cursor in the image. That's small button is the one that brings up the VGS subsystem, if applicable, which is described in other screenshots elsewhere on this website.

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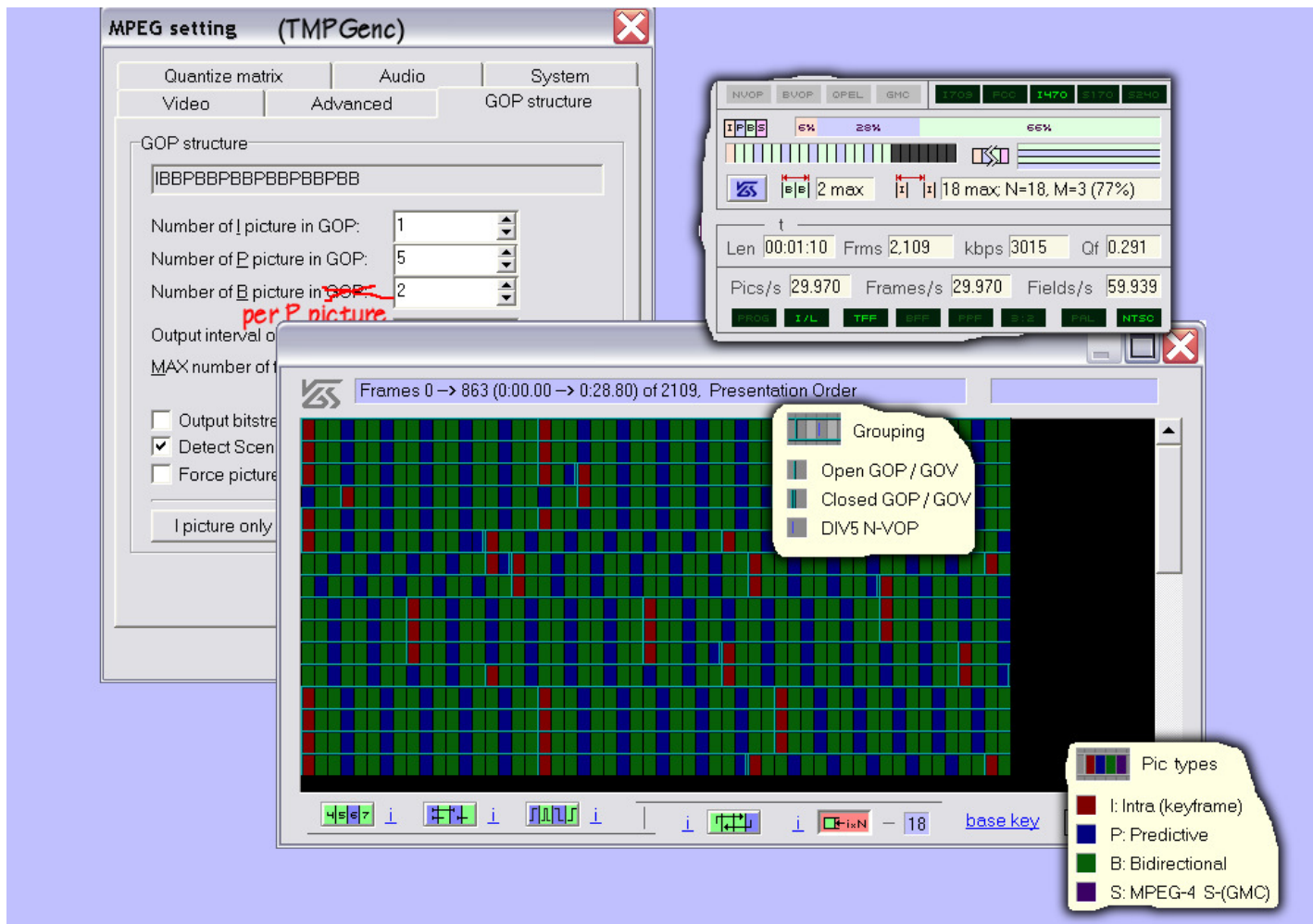
The "Visual GOP Structure" VGS feature information is present in limited summary form, as seen in the small cutout excerpt of the main dialog, above. VGS provides currently provides additional detailed information about MPEG-1, 2, and 4 files and MPEG within AVI (e.g. XviD, DivX). The summary shows items which are settable when encoding, but not usually "readable" from the finished files. This includes the types of frames used, percentage of each in the overall makeup, as max and average distance between "I-frames" ("keyframes"), and max consecutive "B-frames". It also shows the overall structure used and repetitive "GOP structure", if any.

The full VGS dialog itself, if available for the selected filetype, is separate from the main GSPot screen and is accessed from the main screen by pressing the small light blue button on the with stylized navy blue "VGS" logo, as seen main dialog excerpt above

The graphical looking dialog on the lower right of the image above is a simple example of this VGS detail dialog. Refer to the VGS detailed screenshots for the many other capabilities the VGS can provide.

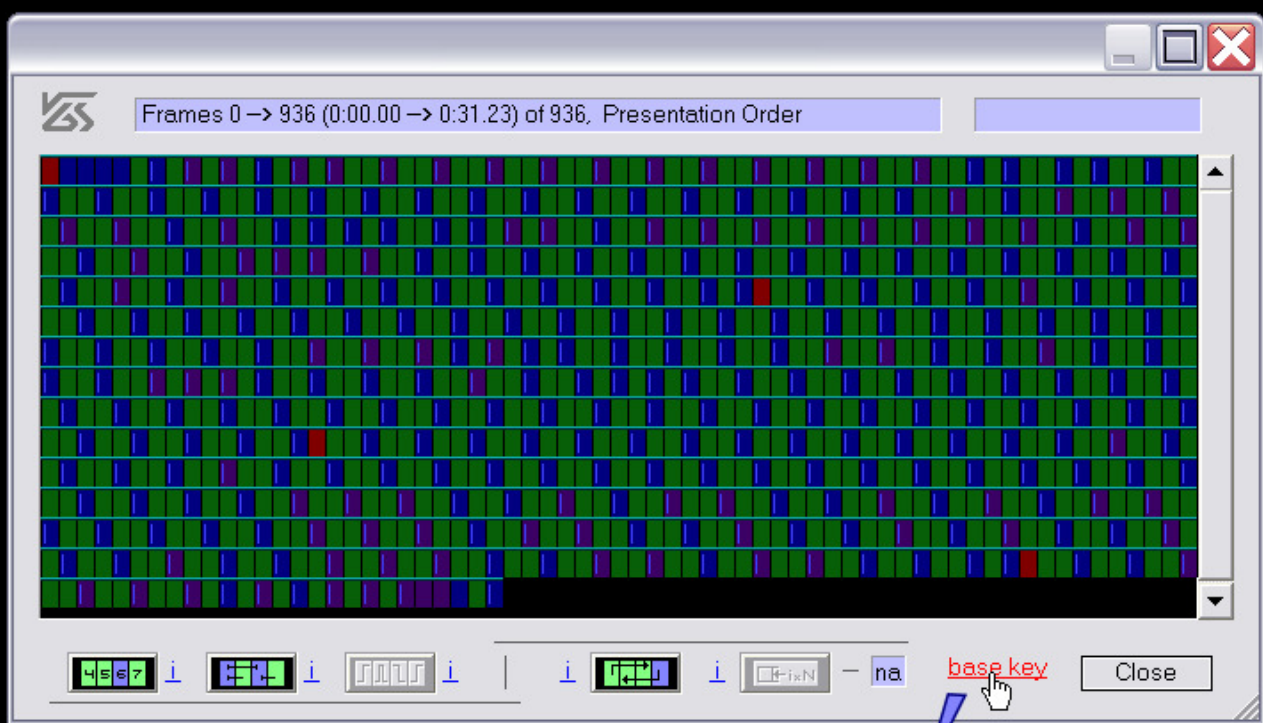
The gray dialog on the left of the image above is a settings dialog TMPGenc (a third-part MPEG creation app, unrelated to GSPot). TMPGenc is an app which allows these technical settings to be specified in detail. It is only shown for reference as an indication of how the settings used to create the test file shown are accurately reflected in by GSPot's analysis of the result. For example, the "IBBPBBPBBPBBPBBPBB" pattern shown on TMPGenc's advanced settings dialog is represented as corresponding colors on the GSPot VGS dialog.

Note: The reason I've crossed out and re-worded one of the labels in TMPGenc's settings dialog because, though it works fine, I consider that particular label poorly worded at best.



The set of screenshots above is nearly identical, although in this case I created the file with TMPGEnc's "Detect Scene Changes" checkbox ticked. As can be seen, the pattern is no longer as repetitive - some keyframes come at an earlier than expected interval and are marked as "Closed GOP". These markings can be used to detect at which frame a "scene change" occurs, as well as where the file could be cut and cleanly spliced (which is not just any keyframe, as people often believe). Again, see the VGS detailed screenshots for more information.

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Key to Base Designations

	Pic types	The colored rectangles represent what may be loosely thought of as "frames" but are technically "coded pictures", which may be different.
	I: Intra (keyframe)	
	P: Predictive	Each is color coded to indicate its basic type. The fourth type, "S", is a variation of "P" found only in certain MPEG-4 files, generally only those using "GMC" (General Motion Compensation).
	B: Bidirectional	
	S: MPEG-4 S-(GMC)	
	Grouping	In MPEG-1 & 2, pictures are always grouped into certain, often repetitive, patterns called GOPS. Grouping in MPEG-4 is optional and the group is called a GOV.
	Open GOP / GOV	
	Closed GOP / GOV	The last one, DIV5 N-VOP, is used in some MPEG-4 AVI files, resulting in a so-called packed bitstream ("PB"). It is not coded as a "marker" like the others, but is rather an actual pic (VOP). It is marked as both "not coded" & "zero duration", however.
	DIV5 N-VOP ("PB")	The latter property makes it more appropriate to show it as thin vertical line rather than having its own colored rectangle, since the rectangles indicate "real" VOPS which consume an actual frame interval.
	Discontinuities & misc.	These are frame (pic) indicator marks. The first four indicate pics where GSpot detected "discontinuities" - a place where a representation of time jumped either backwards or too far forwards relative to other indicators.
	GOP time	
	System time	These may or may not be errors, though they often indicate places where splices were made. "Broken frame bit set" is not a time problem, but rather a bit which is set specifically to indicate that a splice was made.
	Temporal sequence	
	Broken Frame bit set	
	Frame not coded	Not a discontinuity, but rather a frame marked as "not coded" (sometimes called "N-VOP") but with a "non-zero" duration (cf. DIV5 N-VOP above). Efficient for coding an unchanging portion of video (stationary credits, cartoon parts, "slide shows", etc.)

Note: Designations shown in this key comprise the base display. Each overlay button on the bottom has its own help dialog to describe it the information it will show. Click on the blue "i" near each button to display these.

This Lower part of this screenshot shows the main online help or "key" dialog realized by clicking the "base key" hyperlink as seen above. Additional dialogs, specific to the buttons to which they are adjacent, are activated by clicking the small "i" (information) links also seen at the bottom. In addition to being built-in to GSpot, other screenshots on this site show the contents of those dialogs.

The VGS display on the top is just one of many a typical example - this one happens to show a DivX (MPEG-4) file with "GMC", a feature which gives rise to the purple colored frames less commonly seen than the others. This file was also created as a so-called "packed bitstream", giving rise to the vertical light blue bars on many of the frames. Like many MPEG-4 files, there is a lack of any apparent repeating pattern, usually seen in MPEG-1 and MPEG-2. In a case like this, the red keyframes are may have been put in by the encoder at "scene changes", so this type of display can often be used to detect the frame number corresponding to a scene change. On the other hand, the decoder may have been set to "max 100 distance between keyframes", in which case they may not. Lower max distances between keyframes improve the random access capabilities of the file.

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The screenshot shows the GSpot v2.60 interface. At the top, a status bar displays "Frames 0 -> 899 (0:00.00 -> 0:30.00) of 936, Presentation Order". Below this is a large grid of video frames, each represented by a small colored square (green, blue, or red). At the bottom of the grid, there is a control bar with several icons and a button labeled "R=N" with a value of "15" and the text "base key". A blue arrow points from this button to a dialog box titled "Layout Width Control".

The "Layout Width Control" dialog box contains the following text:

This button activates a mode which reduces the display width down to the next multiple of "N", where N is a number GSpot has detected as a possible pattern repetition length characteristic of the file being examined.

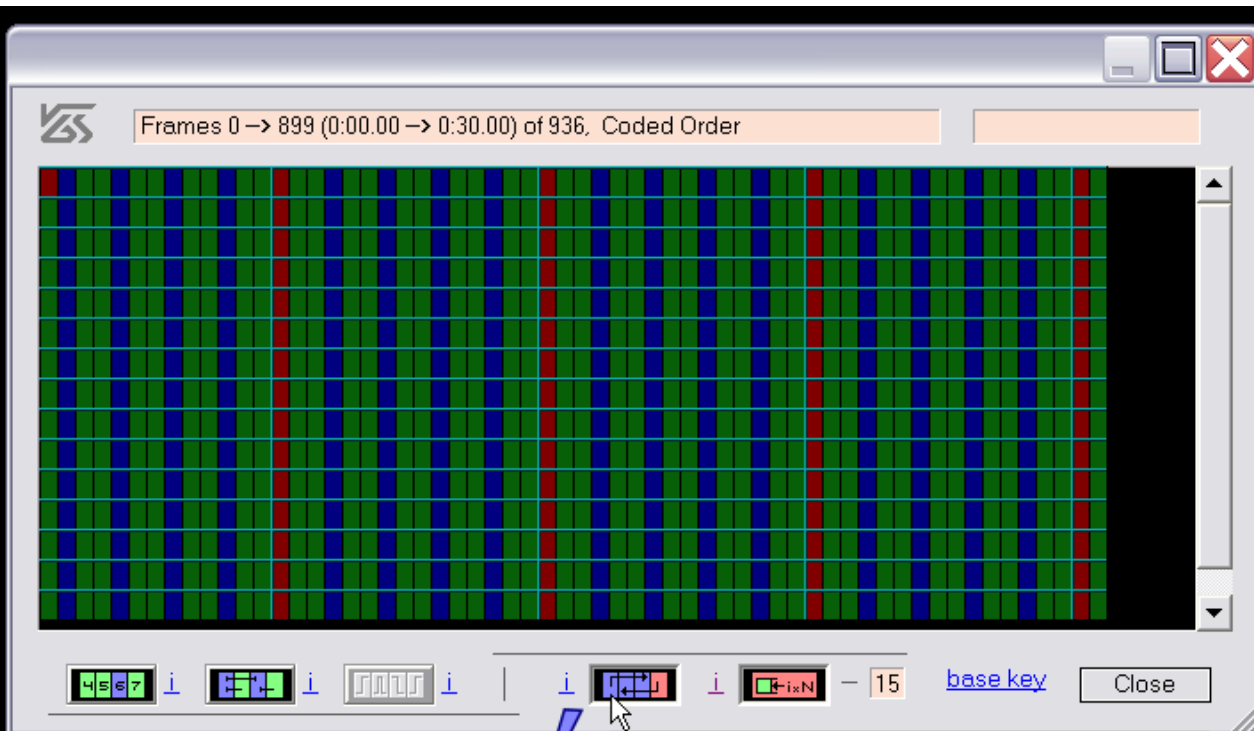
The button does not accomplish any function which cannot also be realized by simply resizing the dialog - which is, in fact, the more flexible method. But this is quick and convenient.

Below the text are two examples of the grid view:

- The first example shows a grid of frames with a pattern of colors. The text next to it says: "Excerpt from the view of a typical 'N=18, M=3' MPEG-1 file, before the layout width button is pressed." The grid is wide, and the repeating pattern is not clearly visible.
- The second example shows the same grid after the layout width button is pressed. The text next to it says: "View of the same file afterwards. GSpot adjusted to width of the display to a multiple of 18 so patterns of that length are more evident." The grid is narrower, and the repeating pattern of colors is much more prominent and easier to see.

This button controls the layout width, as described above.

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"Presentation Order" <==> "Bitstream Order" Select

Picture (frame) Display Order

Some file formats may utilize "B" ("bidirectionally predictive") frames. These "B" frames are partially reconstructed for display using data from a "future" "I" or "P" frame which will be displayed sometime AFTER the "B" frame(s) are displayed.

But to make decoding feasible, the "I" or "P" frame data is REQUIRED first.

For example, if a section of a file has four frames of types I, B, B, P to be displayed as frames 1, 2, 3 and 4 respectively, those four frames are encoded in the file (and hence decoded) in the following order: I, P, B, B.

That way the decoder has the all info it needs to decode those "B" frames.

The decoder first decodes and displays the "I", then decodes the "P" but does NOT display it yet. Using that info, it then decodes and displays the two "B" pics. Finally it displays the "P" - which has already been decoded and put aside a few frames ago.

This button toggles between two ways of presenting the file visually, and can be used in conjunction with any of the other buttons.

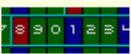
"Presentation Order" shows the order as of the pics as we see them, and equates to our normal definition of "frame number" (i.e. "1, 2, 3, 4" in the above example).

"Coded" or "Bitstream" order shows the pics as they are physically laid out in the file; this would be "1, 4, 2, 3" for the same example.

To avoid confusion, GSpot always DESIGNATES frame numbers with the more familiar "presentation" frame number, so in "presentation order" you will always see consecutive numbers (e.g. if "Frame Number Overlay" is pressed).


When toggled to "Coded Order", the visual display of the frames and their respective designations are rearranged to exhibit the actual file structure. In that case -assuming the file contains "B" frames - the numbers displayed are no longer consecutive.

Frame numbers, when view is set to "presentation order"



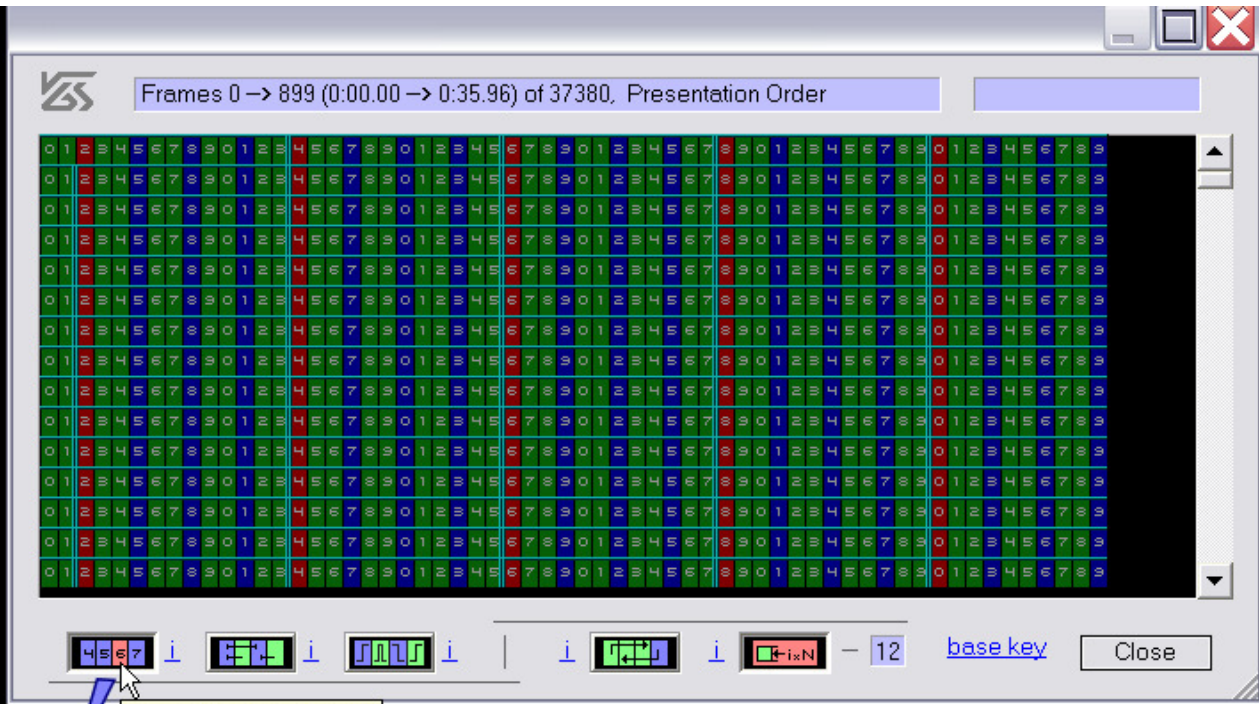
Frames "as you see them" - the numbers shown are always sequential

Frame numbers, when view is set to "coded bitstream order"



This button controls whether the frames are displayed in the order as "seen" or as "encoded", as explained above.

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Frame Number Overlay


Frame Number Overlay

The frame number overlay shows the last digit of the picture number (usually "frame number") for reference. The overlay can be used on either the "presentation" or "bitstream" view, but the number shown ALWAYS represents the presentation order number.

Presentation order picture number is equivalent to standard "frame number" for most PC applications. In some circumstances, though, in particular when a file employs the MPEG 3:2 pull-down feature and is presented on an interlaced display, they are not.


Note: To find the complete number corresponding to a last digit, put the mouse cursor on the picture in question and refer to the box in the upper right of the dialog.

Frame numbers, when view is set to "presentation order"



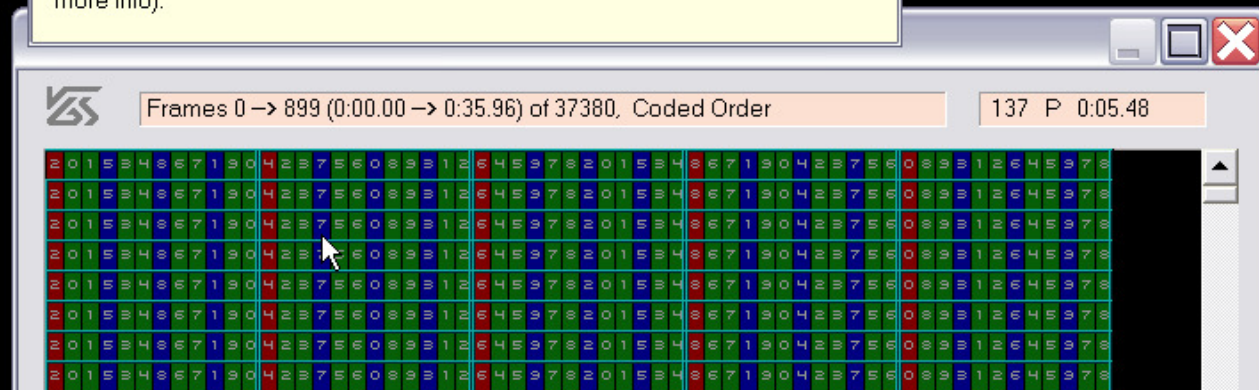
(In this view, the numbers shown are always sequential)

Frame numbers, when view is set to "coded bitstream order"



(Numbers shown may not appear sequential)

This overlay is available for all files, although not all files offer the two views referred to below (see "Presentation Order <=> Coded Bitstream Order" for more info).



This button controls whether the last digit of the frame number (which is all that fit, obviously) is displayed as an overlay on top of each frame, as explained above. The entire frame number is obtained by placing the cursor over the frame and observing the number displayed in the upper right. That's frame "137" in the lower picture, which is why it has a "7". The "P" in the upper right means it's a "P-Frame", which is why it's colored blue, as described in the main VGS key help. The "5:48" in the upper right indicates that this frame occurs located 5 minutes and 48 seconds into the video.

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Frames 0 → 974 (0:00.00 → 0:32.50) of 2402, Presentation Order

- 15 [base key](#)

B-Frame Dependency Overlay

Typical appearance when viewed in 'presentation order': When a gray line appears over green B-pics, it indicates their dependency on other pic(s) at the line's endpoints.

Example: B and C are dependent on A and D

Typical appearance viewed in 'bitstream order': Any gray line over green B-pics indicates their dependency on the pic where the line starts.

Example: B and C are dependent on A (due to the top gray line) and on D (due to the line on the bottom).

This overlay is applicable to files containing B-pictures (MPEG-1 & 2) or B-VOPS (MPEG-4). Option will be grayed out for other files.

Frames 0 → 974 (0:00.00 → 0:32.50) of 2402, Coded Order 420 I 0:14.01

Frames 0 → 318 (0:00.00 → 0:12.72) of 318, Coded Order 160 P 0:06.40

This button controls whether the frames are displayed with a "B-Frame dependency" overlay, as described above. This feature could be useful in determining where a file could be cleanly spliced. When used in conjunction with the "Coded Order" button, as shown on the bottom two screenshots, a file can be cleanly "ended" anywhere where the cut does not cross a horizontal gray line. If the resulting file is to be then appended to, the very next frame must be a keyframe. This should result in a 100% clean "splice".

In the first of the two images immediately above, the file was specifically encoded with a feature called "Closed GOPs", as indicated by the double light blue line at the end of each group. Files are sometimes encoded this way exactly for this purpose (easy splicing). You should never see a gray "dependency" line cross a double vertical "Closed GOP" indicator. This file could be spliced immediately before frame 420, where you see the cursor.

Files without "Closed GOPs" can also be cleanly spliced, though, and this feature will allow you to see where. In the very bottom screenshot, the file could, for example, be "cut" at frame 160 where the cursor is, because there are no horizontal gray lines there. Additional footage could then be appended provided it started with a new keyframe.

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Frames 0 -> 504 (0:00.00 -> 0:21.02) of 504, Presentation Order

Len 00:00:21 Frms 504 kbps 2522 Qf 0.365
 Pics/s 23.976 Frames/s 29.970 Fields/s 59.939

PROG I/L TFR BPF TFP S:2 PAL NTSC

4567 i E-L i J-K i L-M i N-O i P-Q i R-S i T-U i V-W i X-Y i Z-AA i

480 x 480 SeqExt 480 x 480 4:3

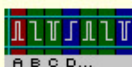
base key Close

Interlace / Field Info Overlay

Interlace / Field Info Overlay



Typical section of a PAL DVD using "top field first"



Typical section of an NTSC DVD using 3:2 pulldown

Key:

- 'B': Picture used to create a top field, then a bottom (1 full frame, total)
- 'D': As above, but reversed - "bottom field first". (1 full frame, total)
- 'A': Three fields: a bottom, a top, & another bottom (1.5 frames, total)
- 'C': As above, but reversed: top, bottom, then top (1.5 fields total)

In the first example, 25FPS material* remains 25FPS, displayed as 25 pairs of fields (50 fields) per second. For each coded picture, the odd numbered lines (top field) are displayed for half a frame time, then the even lines (bottom field).

* Most likely the original material was 24 FPS – it's simply played back 4% faster to get it to 25.

The second example shown is typical 3:2 pulldown, where each pic represents a frame from the original 24FPS material. Half the pics display as the normal two fields (2 fields=one frame), the other half display "half again as many" (3 fields = 1.5 frames).

The resulting 25% extra allows the 24FPS material to play back at 30FPS (60 fields/sec). On a non-interlaced display such as a PC, the media player is likely to ignore all of the above and just play back the original 24 pics at 24 full frames per second.

Regardless of the system, the pattern should be such that top fields always follow bottom and vice versa. This should be evident, assuming "presentation order" has been selected. Any violation is a "continuity error" and will be indicated in red.

Supported for MPEG-2 only.

This button controls toggles an overlay for files are displayed at an increased framerate ("pulldown") on an interlaced display, accomplished by repeating parts of a frame a second time (PAL) or occasionally a third time ("3:2 pulldown", for NTSC). The display is active when the file is encoded at the lower framerate (usually 24 FPS) but must be displayed for TV purposes at 50 or ~60 frames per second. The excerpt from the main dialog overlaying the top VGS screenshot shows that this file was encoded at 23.976 FPS but is intended to play back, on a TV anyway, at 29.970 FPS. This is less relevant on a computer, where it the player will probably just play it back at the lower frame rate, "non-interlaced" (progressive scan).

This feature is only available for certain MPEG-2 files and may still have a few bugs as of GSpot v2.60 vb00

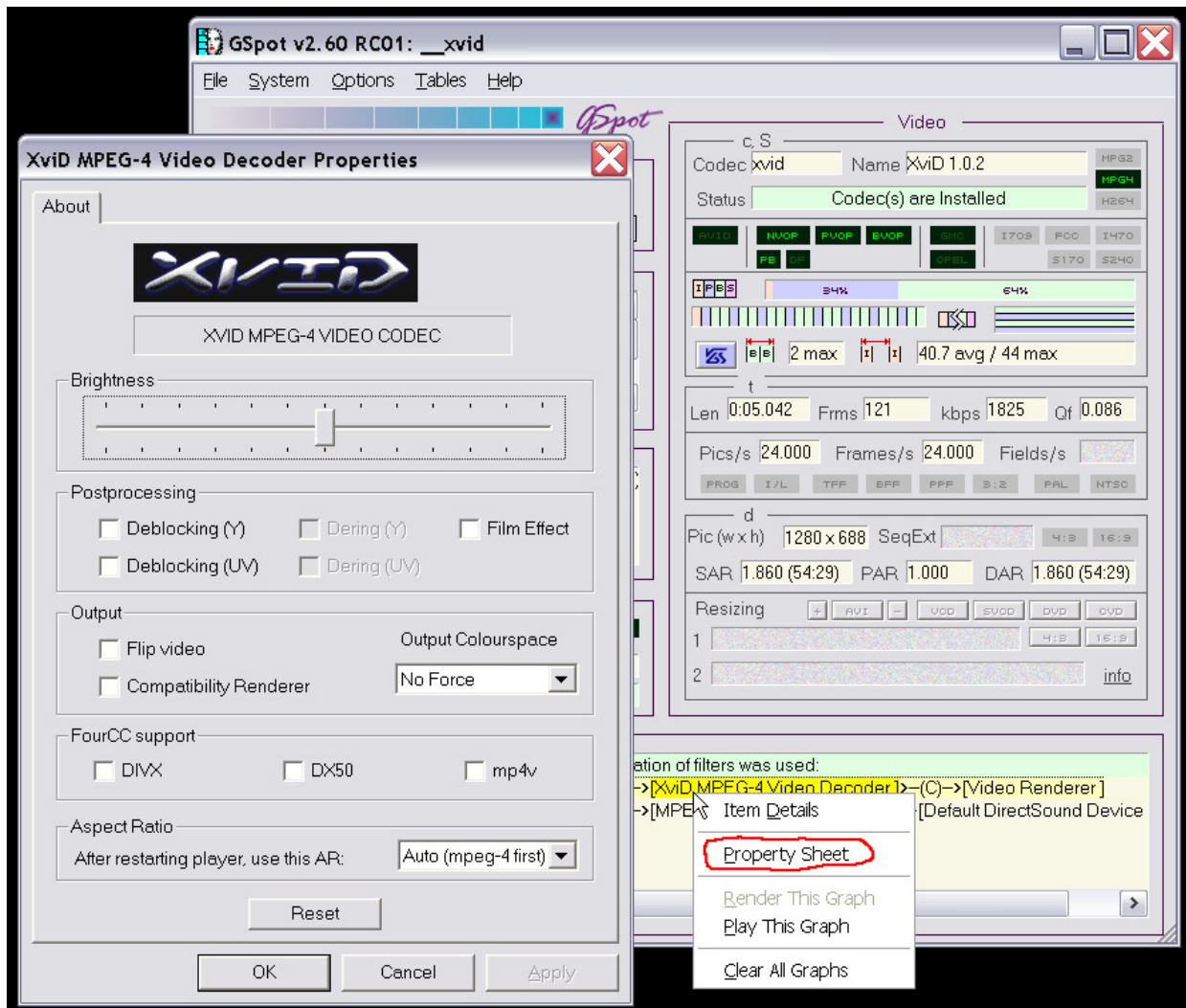
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As of v2.60 RC1, GSpot allows easy display of "third-party" "property pages" for any DirectShow codecs which have implemented this feature. Not available for VFW, ACM or DMO codecs (and many DSH codecs don't have one implemented either). If the menu option is grayed out for the selected filter, the feature is unavailable - otherwise, check it out. It's occasionally interesting, if nothing else, and may allow you to solve problems or at least optimize your playback quality.

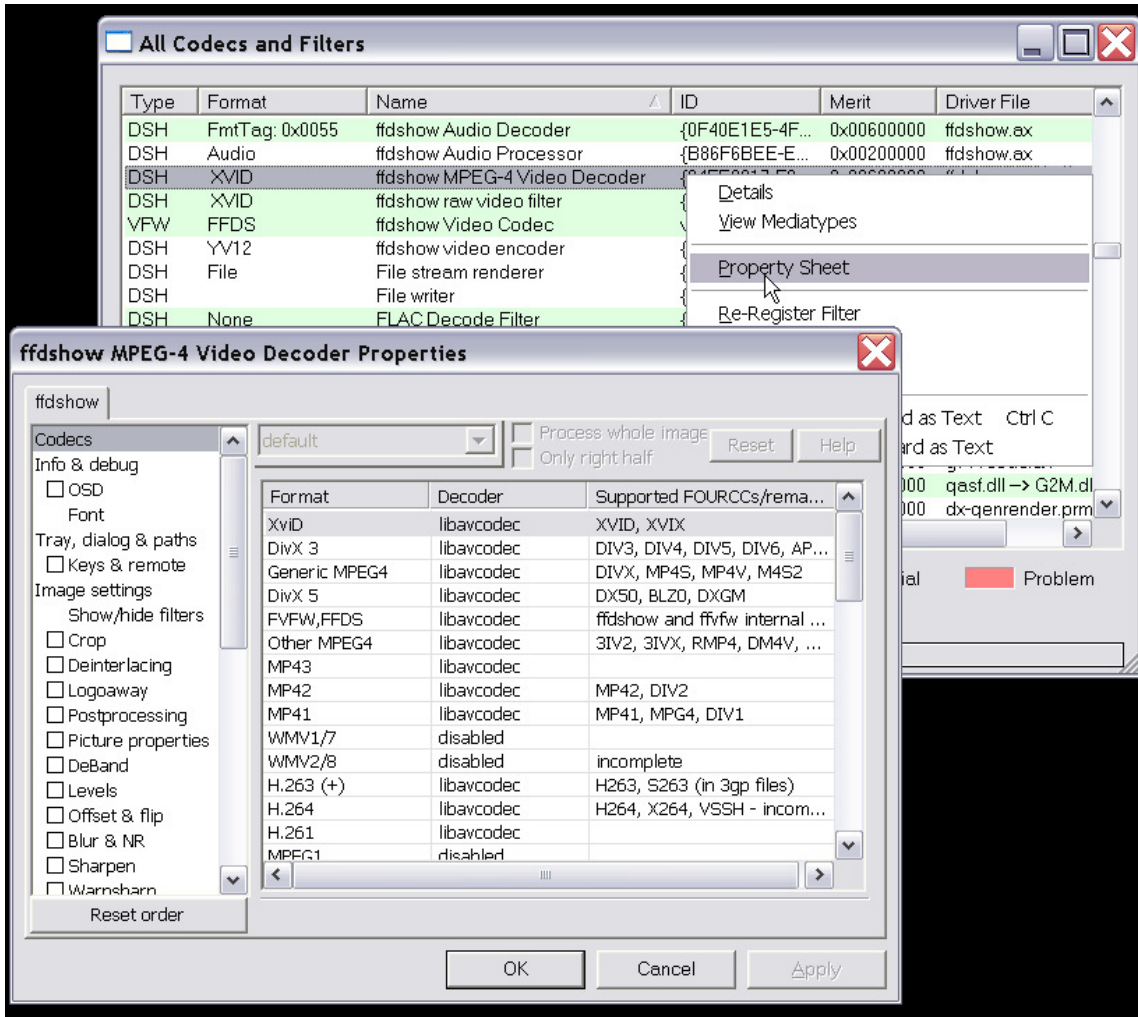
Users who are familiar with encoding files will note that some of these are similar to the Video Compression "Settings" dialog (e.g. when encoding with VirtualDub/VDubMod), and indeed those same dialogs are available if an encoding filter is selected using this feature.

"Decoder" filter property pages - not to mention specialized filters - are not encountered as often, however, so this may be a useful new feature for certain users.

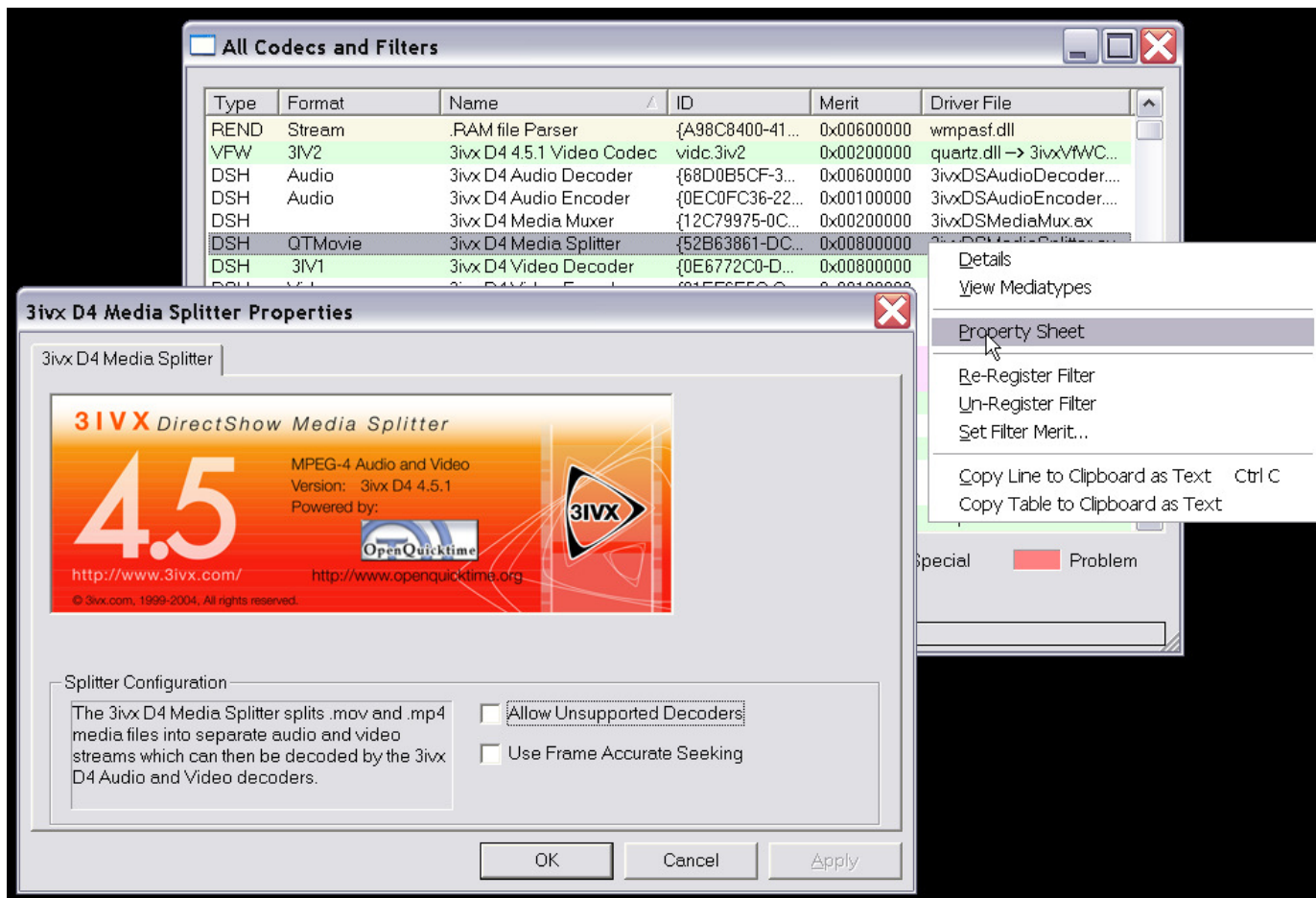
Example of the playback property page for the well-known XviD codec. In this case, the user brought up the page by right clicking on the decoder in question after performing a test render of the file.



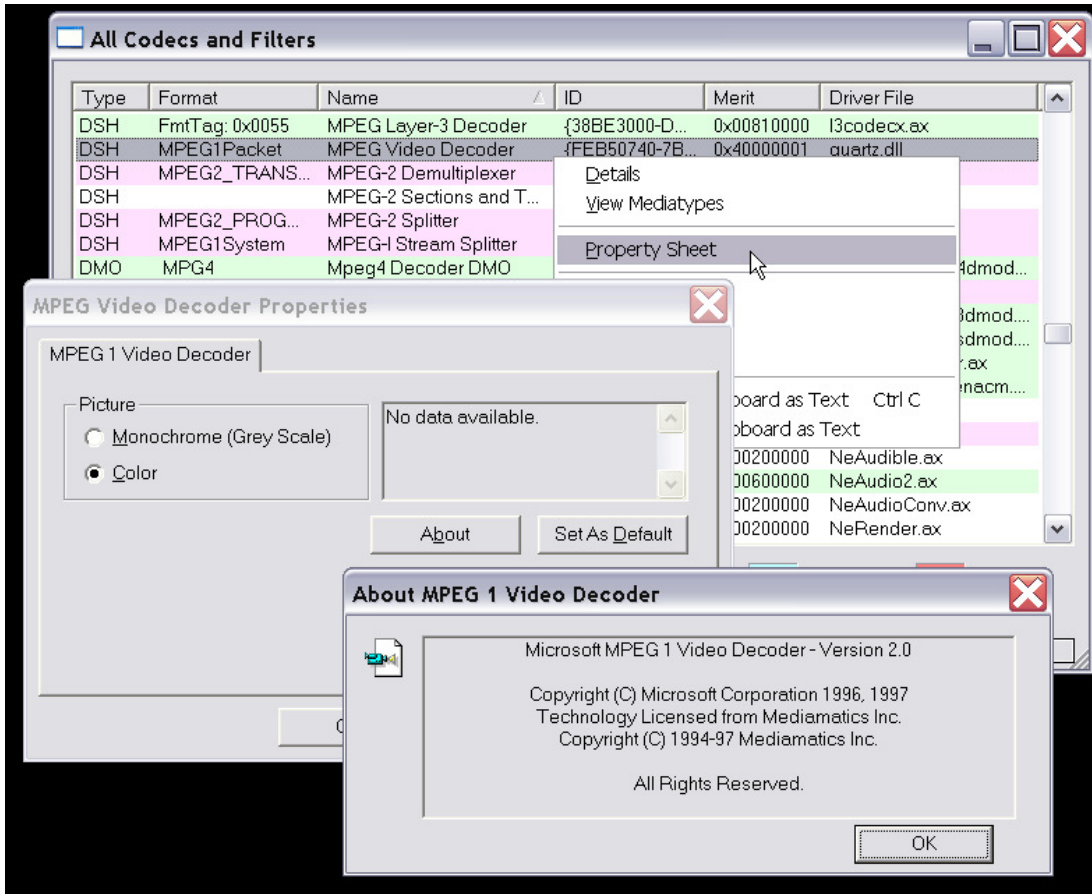
Property page for playback using the well-known ffdshow codec. In this case the user arbitrarily brought up the page from GSpot's "System > List Codecs and Other Filters" dialog - this can be done at any time regardless of whether there's a currently loaded file that may use this decoder.



Example of how you can set properties on DirectShow codecs which are neither encoders nor decoders. Here we see a property page related to "splitter" filter from 3ivx. GSpot will also show property pages for renderers and other filters - any DirectShow filter where the developer bothered to implement one.



You can even examine property pages from ancient codecs that have rarely been seen. Below is the property page for Microsoft's built in MPEG-1 codec which has probably been included in every O/S since Win95. Not exactly a lot of options (monochrome!?!). And who the heck is Mediomatics? I guess in 1996 Microsoft was unable to write their own MPEG-1 decoder!



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