

English version is derived from the [x264 x265 Ultimate Tutorial Project](#) by same author iAvoe

<u><a href="#">LigH</a></u>	.hevc GCC10 [single .exe 8-10-12bit] w/ x86 w/ libx265.dll
<u><a href="#">Rigaya</a></u>	.hevc GCC 9.3 [8-10-12bit] w/ x86
<u><a href="#">Patman</a></u>	.hevc GCC 11+MSVC1925 [8-10-12bit]
<u><a href="#">ShortKatz</a></u>	arm64~64e with x86 ? [?] macOS compiling needed
<u><a href="#">DJATOM-aMod</a></u>	Intel, AMD zen1~2 [10bit], zen3 [10-12bit] GCC 10.2.1+GCC10.3
<u><a href="#">MeteorRain-yuuki</a></u>	Is mash.mkv/mp4 或 .hevc [lavf isn't as reliable as pipe acc. rumor] GCC 9.3+ICC 1900+MSVC 1916 [8][10][12bit]+[8-10-12bit]
<u><a href="#">ffmpeg</a></u> all OS compatible. backup link: ottverse.com/ffmpeg-builds	
<u><a href="#">mpv player</a></u> a small sized opensource video player with no color issues afaik	
<u><a href="#">x265GuiEx (Rigaya)</a></u> 日本語, compiles by auto-setup, <a href="#">link for tutorial</a>	
<u><a href="#">Voukoder; V-Connector</a></u> free Premiere/Vegas/AE/Davinci Studio with libx264, libx265 presets from this tutorial loaded, currently the best exp. solution	

The screenshot shows the Voukoder website interface. The 'Download' dropdown menu is open, displaying a list of available connectors and their corresponding software versions:

- Voukoder 5
- Connector: Premiere 1.4.0
- Connector: After Effects 0.9.4
- Connector: VEGAS Pro 0.7.2

## x265.exe command line usage for new users

[Download ffmpeg & x265 to a memorable path, in screenshot they are at D:\]

Location	File Name	Date	Type	Size
София (D:)	ffmpeg.exe	2021/10/30 12:22	应用程序	93,660 KB
Creek-SC1NA400G (E:)				
Regme-HDWD120-58I				
Cabliccus (I:)				
Hersert-HUH728080 (J)				
Cynic-HUH724040 (N:)	x265-8bit.exe	2021/2/12 18:13	应用程序	20,720 KB
	x265-10bit.exe	2021/3/17 17:13	应用程序	1,174 KB

[Open Windows CMD.exe, click Start and punch in c, m, d will do]

```
C:\Users\ADMINI~1>选择管理员: 命令提示符
```

```
Microsoft Windows [版本 10.0.17763.2628]  
(c) 2018 Microsoft Corporation。保留所有权利。
```

```
C:\Users\JC>D:\x265-10bit.exe -V  
x265 [info]: HEVC encoder version 3.5+20-4c4ae0bc [DJATOM's Mod]  
x265 [info]: build info [GCC 10.2.1][64 bit] 10bit  
x265 [info]: using cpu capabilities: MMX2 SSE2Fast LZCNT SSSE3 SSE4.2 AVX FMA3 BMI2 AVX2
```

```
C:\Users\JC>D:\ffmpeg.exe  
ffmpeg version n4.4.1-20211030 Copyright (c) 2000-2021 the FFmpeg developers  
built with gcc 10-win32 (GCC) 20210610  
configuration: --prefix=ffbuild\prefix --pkg-config-prefix= --pkg-config-pkg-config= --cross-prefix=x86_64-w64-mingw32 --arch=x86_64 --target-os=mingw32 --enable-gpl --enable-version3 --disable-debug --disable-w32threads --enable-  
pthread --enable-iconv --enable-libxml2 --enable-zlib --enable-lbfreetype --enable-lbfribidi --enable-gmp --enable-lzma --enable-fontconfig --enable-libvorbis --enable-opencsl --enable-libvmaf --enable-vulkan --enable-libxcb --disable-xl  
ib --enable-amf --enable-lbaom --enable-avisynth --enable-libdavd --enable-libdav2s --disable-lbfdk-aac --enable-fnfn  
codec --enable-cuda-llvm --disable-frei0r --enable-libgslang --enable-libgme --enable-libass --enable-libbluray --enab  
le-libmp3lame --enable-libopus --enable-libtheora --enable-libvp8 --enable-libwebp --enable-lv2 --enable-libmfx --enable-  
libopencore-amrn --enable-libopencore-amrw --enable-libopenh264 --enable-librav1e --enable-librubberband --enable-sch  
annel --enable-sdl2 --enable-libsoxr --enable-lbsrt --enable-lbsvtav1 --enable-libtwolame --enable-libuavs3d --disabl  
elibrdm --disable-vaapi --enable-libvidstab --enable-libx264 --enable-libx265 --enable-libxavs2 --enable-libxvid --enab  
le-libzing --enable-libzvbi --extra-cflags=-DLIBTWOLAME_STATIC --extra-cxxflags= --extra-ldflags=-pthread --extra-ldexefla  
gs= --extra-libs=lgomp --extra-version=20211030
```

[CMD auto-filling] Write some portion of PATH/filename, and hit [Tab] will trigger it

[ffmpeg build ver.] `ffmpeg.exe`; [x265 build ver.] `x265.exe -V`

[Export, Import] `x265.exe [options] --output C:\folder\export.mp4 C:\folder\import.mp4`

- Only possible with x265.exe with lavf decoder built-in, but you are copying completed command anyways, so no worries about this

[Unix pipe formats] Check [ffmpeg, VS, avs2yuv pipe](#)

[Use case] `D:\ffmpeg.exe -i F:\video.mov -an -pix_fmt yuv420p10 -f yuv4mpegpipe -strict unofficial - | D:\x265-10bit.exe -D 10 --input-csp i444 --allow-non-conformance --rect --ctu 64 --min-cu-size 8 --limit-tu 1 --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 16 --me star --subme 6 --merange 48 --analyze-src-pics --max-merge 4 --early-skip --b-intra --no-open-gop --radl 3 --min-keyint 5 --keyint 240 --ref 3 --fades --bframes 14 --b-adapt 2 --crf 16.5 --rdoq-level 2 --psy-rdoq 4 --aq-mode 4 --qg-size 16 --rd 5 --limit-modes --limit-refs 1 --rskip 1 --rd-refine --splitrd-skip --no-sao --tskip --master-display G(8500,39850)B(6550,2300)R(35400,14600)WP(15635,16450)L(10000000,1) --colorprim bt2020 --colormatrix bt2020nc --transfer smpte2084 --y4m - --output F:\done.hevc`  
`2>D:\Desktop\ffmpeg_or_x265_error_logs.txt`

## ffmpeg, VS, avs2yuv pipe

`ffmpeg -i video_in.mp4 -an -f yuv4mpegpipe -strict unofficial - | x265 --y4m - --output`

`ffmpeg -i video_in.mp4 -an -f rawvideo - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output`

`-format`, `-an` bypass audio, `-strict unofficial` lift std. restrictions, `--y4m` for "YUV for MPEG", both "-" passes stream through the Unix pipe

`VSpire.exe VSScript.vpy --y4m - | x265.exe - --y4m --output`

`VSpire/avs2yuv VSScript.vpy - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output`

`avs2yuv.exe AVSScript.avs -raw - | x265.exe --input-res <WxH> --fps <int/flo/frac> - --output`

## .ass subtitle rendering

Single font, math operators( $\sum \int \infty$ ): `avs texttosub()`

Multi font, math opts, art letters ( $\mathcal{K}\mathfrak{A}$ ), super/subscripts( $9^9_9$ ): `ffmpeg -filter_complex "ass='F\:/mySub.ass'"`

**Stop encoding & mux encoded frames:** Ctrl+C (x265.exe built-in feature?)

**ffmpeg multiplexing** (*change extension for different formats*)

- `ffmpeg.exe -i ".\video_stream.mp4" -an -c:v copy -i ".\audio_stream.aac" -c copy "mux_out.mov"`

**ffmpeg replace existing audio** (*itoffset ±seconds to align new audio stream*)

- `ffmpeg.exe -i ".\mux_in.mov" -itsoffset 0 -i ".\new_ad_st_in.aac" -c:v copy -map 0:v:0 -map 1:a:0 -c:a copy ".\new_mux_out.mov"`

**ffmpeg conv. framerate mode:** `-vsync cfr (1) / vfr (2) / drop`

**ffmpeg built-in scaling:** `-sws_flags bicubic bitexact gauss neighbor bicublin lanczos spline +full_chroma_int`

`+full_chroma_inp +accurate_rnd` (e.g.: `-sws_flags bitexact+full_chroma_int+full_chroma_inp+accurate_rnd`)

**HDR Tags** `--master-display` <manually tagging for instruct video players or decoders to correctly play HDR sources

**DCI-P3:** `G(13250,34500)B(7500,3000)R(34000,16000)WP(15635,16450)L(? ,1)`

**bt709:** `G(15000,30000)B(7500,3000)R(32000,16500)WP(15635,16450)L(? ,1)`

**bt2020:** `G(8500,39850)B(6550,2300)R(35400,14600)WP(15635,16450)L(? ,1)`

- Check HDR source's metadata for color space , then copy the corresponding settings above as param value
- max for L has no standards, which means every video could be different, check your source stream

**DCI-P3:** `G(x0.265, y0.690), B(x0.150, y0.060), R(x0.680, y0.320), WP(x0.3127, y0.329)`

**bt709:** `G(x0.30, y0.60), B(x0.150, y0.060), R(x0.640, y0.330), WP(x0.3127,y0.329)`

**bt2020:** `G(x0.170, y0.797), B(x0.131, y0.046), R(x0.708, y0.292), WP(x0.3127,y0.329)>`

`-- cll` <same value as master-display max L>

**Color** `--colormatrix` <as src, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2085 ictcp>

**Primaries** `--transfer` <as source, e.g.: gbr bt709 fcc bt470bg smpte170m YCgCo bt2020nc bt2020c smpte2085 ictcp>

# General Purpose·Simple

---generalized configurable options for simplicity

<b>splt-trans</b>	<code>--min-cu-size 16 --limit-tu 1 --tu-intra-depth 2 --tu-inter-depth 2 --rdpenalty 1</code>
<b>srch-cmpn</b>	<code>--me umh --subme 5 --merange 48 --rskip 1 --weightb --mctf</code>
<b>ref-rateol</b>	<code>--ref 3 --early-skip --no-open-gop --min-keyint 5 --fades --bframes 11 --b-adapt 2</code>  <code>--radl 2 --fast-intra --hist-scenecut</code>
<b>quantize</b>	<code>--crf 18 --crqpoffs -2</code>
<b>adpt quant</b>	<code>--aq-mode 4 --qg-size 16</code>
<b>rdo-mdecs</b>	<code>--rd 5 --splitrd-skip --rdoq-level 1 --limit-modes --rect --tskip-fast</code>
<b>sao</b>	<code>--limit-sao --sao-non-deblock --deblock 0:-1</code>
<b>io</b>	<code>--hash crc --allow-non-conformance</code>
<b>tgt. depth</b>	<code>-D 8/10/12</code> (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ <code>--dither</code> )
<b>multi node</b>	<code>--pools ,,,</code> , (e.g.: <code>"-,+"states PC w/ 2 nodes &amp; use the 2<sup>nd</sup> only</code> , using both nodes causes mem. delay)
<b>Others</b>	<u><a href="#">crop:</a></u> <code>--display-window &lt; integer "←, ↑, →, ↓ " pixels &gt;</code> , <u><a href="#">≥16 core cpu opt.:</a></u> <code>--pme</code> , <u><a href="#">interlaced:</a></u> <code>--</code>  <code>field</code> , <u><a href="#">pixel depth reduction quality+:</a></u> <code>--dither</code> , <u><a href="#">begin; ending frame:</a></u> <code>--seek; --frames</code> , <u><a href="#">crf/abr resist</a></u>  <u><a href="#">noise factor:</a></u> <code>--rc-grain</code>

## (ffmpeg pipe) x265 CLI parameters

- `ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --min-cu-size 16 --limit-tu 1 --tu-intra-depth 2 --tu-inter-depth 2 --rdpenalty 1 --me umh --subme 5 --merange 48 --rskip 1 --weightb --mctf --ref 3 --early-skip --no-open-gop --max-merge 2 --min-keyint 5 --fades --bframes 11 --b-adapt 2 --radl 2 --fast-`

```

intra --hist-scenecut --crf 18 --crqpoffs -2 --aq-mode 4 --qg-size 16 --rd 5 --splitrd-skip --
rdoq-level 1 --limit-modes --rect --tskip-fast --limit-sao --sao-non-deblock --deblock 0:-1 --
hash crc --allow-non-conformance --y4m - --output ".\v_out.mp4"

```

### libx265 CLI, compatible w/ libav fork

- ```

ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -x265params
"min-cu-size=16:limit-tu=1:tu-intra-depth=2:tu-inter-
depth=2:rdpenalty=1:me=umh:subme=5:merange=48:rskip=1:weightb=1:mctf=1:ref=3:early-skip=1:max-
merge=2:open-gop=0:min-keyint=5:fades=1:bframes=11:b-adapt=2:radl=2:fast-intra=1:hist-
scenecut=1:crf=18:crqpoffs=-2:aq-mode=4:qg-size=16:rd=5:splitrd-skip=1:rdoq-level=1:limit-
modes=1:rect=1:tskip-fast=1:limit-sao=1:sao-non-deblock=1:deblock=0:-1:hash=crc:allow-non-
conformance=1" -c:a copy ".\v_out.mp4"

```
- Depth, colorspace:** -pix\_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

### libkvazaar CLI (in dev, crf mode missing) (libx265 ffmpeg CLI is lacking 85% of params, skipped)

- ```

ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libkvazaar -kvazaar-
params "limit-tu=1:tr-depth-intra=2:pu-depth-intra=4:pu-depth-
inter=3:smp=1:amp=1:bipred=1:me=tz:subme=4:merange=48:me-early-termination=off:max-
merge=2:ref=3:open-gop=0:period=360:gop=16:transform-skip=1:qp=16:fast-residual-cost=1:early-
skip=1:max-merge=4:rd=3:mv-rdo=1:rdoq-skip=1:intra-rdo-et=1:sao=edge:hash=checksum" -c:a copy
".\v_out.mp4"

```

# General Purpose·Std.

---Contains many custom options for some trade offs

**splt-trans** --tu-intra-depth 3 --tu-inter-depth 3 --limit-tu 1 --rdpenalty 1

**srch-cmpns** --me umh --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --merange 48 --analyze-src-pics  
--weightb --mctf

**ref-rateol** --ref 3 --max-merge <2fast, 3, 4slow> --early-skip --no-open-gop --min-keyint 5 --  
keyint <9×fps> --fades --bframes 11 --b-adapt 2 --radl 3 <sharp source: --pbratio 1.2>

**intra coding** --hist-scenecut <fast: --fast-intra / mid: 不填 / slow: --b-intra / slower: + --constrained-intra >

**quantization** --crf <16~18less-loss 19 ~20good> --crqpoffs -3 --cbqpoffs -1

**rdoq** --rdoq-level <1fast, 2slow>

**adapt quant** <anime source: --hevc-aq, remove aq-mode> --aq-mode 4 --aq-strength <flat=0.8, edgy=1>

**md decision** --rd 5 --limit-modes --limit-refs 1 --rskip <3fast, 2, 1slow> --rc-lookahead <3×fps> --  
tskip-fast --rect <veryslow: --amp>

**rdo** --psy-rd <film=1.6, anime=0.6, +0.6 if ctu=64, -0.6 if ctu=16> --splitrd-skip <EXP: --qp-  
adaptation-range 3>

**deblock-sao** --limit-sao --sao-non-deblock --deblock 0:-1

**io** --hash crc --allow-non-conformance <外/内网 NAS 串流: --idr-recovery-sei>

**tgt. depth** -D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ --dither)

**multi node** --pools ,,, (e.g.: "-,+ "states PC with 2 nodes & use the 2<sup>nd</sup> only, using both nodes causes mem. delay)

**Others** [crop:](#) --display-window < integer "←, ↑, →, ↓ " pixels >, [≥16 core cpu opt.:](#) --pme, [interlaced:](#) --  
field, [pixel depth reduction quality+:](#) --dither, [begin; ending frame:](#) --seek; --frames, [crf/abr resist](#)  
[noise factor:](#) --rc-grain

## (ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide\_banner -i ".\v\_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --ctu ○ --min-cu-size 16 --tu-intra-depth 3 --tu-inter-depth 3 --limit-tu 1 --rdpenalty 1 --me umh --subme ○ --merange 48 --analyze-src-pics --weightb --mctf --ref 3 --max-merge ○ --early-skip --no-open-gop --min-keyint 5 --fades --bframes 11 --b-adapt 2 --radl 3 --pbratio 1.2 --hist-scenecut --fast-intra --b-intra --constrained-intra --crf ○ --crqpoffs -3 --crqpoffs -1 --rdoq-level ○ --aq-mode 4 --aq-strength ○ --rd 5 --limit-modes --limit-refs 1 --rskip ○ --rc-lookahead ○ --tskip-fast --rect --amp --psy-rd ○ --splitrd-skip --qp-adaptation-range 4 --limit-sao --sao-non-deblock --deblock 0:-1 --hash crc --allow-non-conformance --y4m - --output ".\v\_out.mp4"

## libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide\_banner -i ".\v\_in.mp4" -c:v libx265 -x265params "ctu=○:min-cu-size=16:tu-intra-depth=3:tu-inter-depth=3:limit-tu=1:rdpenalty=1:me=umh:subme=○:merange=48:analyze-src-pics=1:weightb=1:mctf=1:ref=3:max-merge=○:early-skip=1:open-gop=0:min-keyint=5:fades=1:bframes=11:b-adapt=2:radl=3:pbratio=1.2:hist-scenecut=1:fast-intra=1:b-intra=1:constrained-intra=1:crf=○:crqpoffs=-3:cbqpoffs=-1:rdoq-level=○:aq-mode=4:aq-strength=○:rd=5:limit-modes=1:limit-refs=1:rskip=○:rc-lookahead=○:tskip-fast=1:rect=1:amp=1:psy-rd=○:splitrd-skip=1:qp-adaptation-range=4:limit-sao=1:sao-non-deblock=1:deblock=0:-1:hash=crc:allow-non-conformance=1" -c:a copy ".\v\_out.mp4"
- Depth, colorspace:** -pix\_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

# High Compression·Film

**splt-trans** --tu-intra-depth 4 --tu-inter-depth 4 --limit-tu 1

**srch-cmpns** --me star --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --merange 48 --analyze-src-pics --weightb --mctf

**ref-rateol** --ref 3 --max-merge 4 --no-open-gop --min-keyint 3 --keyint <13 × fps> --fades --bframes 14 --b-adapt 2 --radl 3

**intra coding** --hist-scenecut --constrained-intra --b-intra

**quantization** --crf 21.8 --qpmin 8 --crqpoffs -3 --ipratio 1.2 --pbratio 1.5

**rdoq** --rdoq-level 2

**adapt.quant** --aq-mode 4 --aq-strength <clean source=0.8, film=1> --qg-size 8

**md decision** --rd 5 --limit-refs 0 --rskip 0 --rc-lookahead <1.8 × fps> --rect --amp

**rdo** --psy-rd <film=1.6, animation=0.6, +0.6 if ctu=64, -0.6 if ctu=16> --rd-refine <EXP: --qp-adaptation-range 3>

**deblock** --deblock 0:0

**sao** --limit-sao --sao-non-deblock --selective-sao 3

**io** --hash crc --allow-non-conformance --nr-inter 8 <NAS streaming: --idr-recovery-sei>

**tgt. depth** -D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ --dither)

**others** [crop:](#) --display-window < integer "←, ↑, →, ↓" pixels >, [≥16 core cpu opt.:](#) --pme, [interlaced:](#) --field, [pixel depth reduction quality+:](#) --dither, [begin; ending frame:](#) --seek; --frames, [crf/abr resist](#)  
[noise factor:](#) --rc-grain, [multi-node:](#) --pools ,,,



## (ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide\_banner -i ".\v\_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --tu-intra-depth 4 --tu-inter-depth 4 --limit-tu 1 --me star --subme ☐ --merange 48 --analyze-src-pics --weightb --mctf --ref 3 --max-merge 4 --no-open-gop --min-keyint 3 --keyint ☐ --fades --bframes 14 --b-adapt 2 --radl 3 --hist-scenecut --constrained-intra --b-intra --crf 21.8 --qpmin 8 --crqpoffs -3 --ipratio 1.2 --pbratio 1.5 --rdoq-level 2 --aq-mode 4 --aq-strength ☐ --qg-size 8 --rd 5 --limit-refs 0 --rskip 0 --rc-lookahead ☐ --rect --amp --psy-rd ☐ --rd-refine --qp-adaptation-range 3 --deblock 0:0 --limit-sao --sao-non-deblock --selective-sao 3 --hash crc --allow-non-conformance --y4m - --output ".\v\_out.mp4"

## libx265 CLI, compatible w/ libav fork

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide\_banner -i ".\v\_in.mp4" -c:v libx265 -x265params "tu-intra-depth=4:tu-inter-depth=4:limit-tu=1:me=star:subme=☐ :merange=48:weightb=1:mctf=1:ref=3:max-merge=4:open-gop=0:min-keyint=3:keyint=☐ :fades=1:bframes=14:b-adapt=2:radl=3:hist-scenecut=1:constrained-intra=1:b-intra=1:crf=21.8:qpmin=8:crqpoffs=-3:ipratio=1.2:pbratio=1.5:rdoq-level=2:aq-mode=4:aq-strength=☐ :qg-size=8:rd=5:limit-refs=0:rskip=0:rc-lookahead=☐ :rect=1:amp=1:psy-rd=☐ :rd-refine=1:qp-adaptation-range=3:deblock=0:0:limit-sao=1:sao-non-deblock=1:selective-sao=3:hash=crc:allow-non-conformance=1" -c:a copy ".\v\_out.mp4"
- Depth, colorspace:** -pix\_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

# Editing footage·Render & Reuse

<b>block/unit spitting</b>	<code>--ctu 32</code>
<b>motion search</b>	<code>--me star --subme &lt;24fps=3, 48fps=4, 60fps=5, 100fps=6&gt; --merange 48 --analyze--src-pics</code>
<b>intraframe search</b>	<code>--max-merge 4 --early-skip --b-intra</code>
<b>rate control</b>	<code>--hist-scenecut --no-open-gop --min-keyint 1 --keyint &lt;7×fps&gt; --ref 3 --fades</code>
<b>quantization</b>	<code>--bframes 7 --b-adapt 2</code>
<b>mode decision</b>	<code>--crf 17 --crqpoffs -3 --cbqpoffs -2</code>
<b>R-D optimization</b>	<code>--rd 5 --limit-modes --limit-refs 1 --rskip 1 --rc-lookahead &lt;4 × fps&gt; --splitrd-skip --rd-refine</code>
<b>deblock</b>	<code>--deblock 0:-1</code>
<b>input output</b>	<code>--hash crc --allow-non-conformance</code>
<b>tuning</b>	<code>--tune grain</code>
<b>tgt pixel bit depth</b>	<code>-D 8/10/12</code>
<b>others</b>	<code><a href="#">crop</a>: --display-window &lt; integer "←, ↑, →, ↓ " pixels &gt;, <a href="#">≥ 16 core cpu opt.</a>: --pme, <a href="#">interlaced</a>: --field, <a href="#">pixel depth reduction quality+</a>: --dither, <a href="#">begin; ending frame</a>: --seek; --frames, <a href="#">crf/abr resist noise factor</a>: --rc-grain, <a href="#">multi-node</a>: --pools ,,,</code>

## (ffmpeg pipe) x265 CLI parameters

- ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide\_banner -i ".\v\_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --ctu 32 --me star --subme ○ --merange 48 --analyze--src-pics --max-

```
merge 4 --early-skip --b-intra --hist-scenecut --no-open-gop --min-keyint 1 --keyint ○ --
ref 3 --fades --bframes 7 --b-adapt 2 --crf 17 --crqpoffs -3 --cbqpoffs -2 --rd 5 --limit-modes
--limit-refs 1 --rskip 1 --rc-lookahead ○ --splitrd-skip --deblock -1:-1 --hash crc --allow-
non-conformance --tune grain --y4m - --output ".\v_out.mp4"
```

## libx265 CLI, compatible w/ libav fork

- ```
ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -x265params
"ctu=32:me=star:subme=○:merange=48:analyze-src-pics=1:max-merge=4:early-skip=1:hist-
scenecut=1:open-gop=0:min-keyint=1:keyint=○:ref=3:fades=1:bframes=7:b-
adapt=2:radl=3:constrained-intra=1:b-intra=1:crf=17:crqpoffs=-3:cbqpoffs=-2:rd=5:limit-
modes=1:limit-refs=1:rskip=1:rc-lookahead=○:splitrd-skip=1:deblock=-1:-1:hash=crc:allow-non-
conformance=1:tune=grain" -c:a copy ".\v_out.mp4"
```
- Depth, colorspace:** -pix\_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...

# Anime·High Compression·Subtitle Groups

**splt-trans** --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 16

**srch-cmpns** --me umh --merange 48 --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --weightb <remove  
weightb for 80's anime that doesn't have lighting fades> --max-merge 4 --early-skip --mctf

**ref-rateol** --ref 3 --no-open-gop --min-keyint 5 --keyint <12×fps> --fades --bframes 16 --b-adapt  
2 --radl 3 --bframe-bias 20

**intra coding** --hist-scenecut --constrained-intra --b-intra

**quantization** --crf 19 --crqpoffs -4 --cbqpoffs -2 --ipratio 1.6 --pbratio 1.3 --cu-lossless --tskip

**rdoq** --psy-rdoq 2.3 --rdoq-level 2

**aq** --hevc-aq --qg-size 8

**md** --rd 5 --limit-modes --limit-refs 1 --rskip 1 --rc-lookahead <2.5 × fps> --rect --amp

**rdo** --psy-rd 1.5 --rd-refine --splitrd-skip --rdpenalty 2 <EXP: --qp-adaptation-range 4>

**deblock** --deblock 0:-1

**sao** --limit-sao --sao-non-deblock

**io** --hash crc --allow-non-conformance --single-sei <NAS streaming: --idr-recovery-sei>

**multi nodes** -D 8/10/12 (default 8bit or lowest built in x265.exe, same or convert to lower depth only w/ --dither)

**tgt. depth** --pools ,,, (e.g.: "-", "+" states PC with 2 nodes & use the 2<sup>nd</sup> only, using both nodes causes mem. delay)

**others** [crop](#): --display-window < integer "←, ↑, →, ↓" pixels >, [≥16 core cpu opt.](#): --pme, [interlaced](#): --field,  
[pixel depth reduction quality+](#): --dither, [begin; ending frame](#): --seek; --frames, [crf/abr resist noise](#)  
[factor](#): --rc-grain

## (ffmpeg pipe) x265 CLI parameters

- `ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 16 --me umh --subme 0 --merange 48 --weightb --max-merge 4 --early-skip --mctf --ref 3 --no-open-gop --min-keyint 5 --keyint 0 --fades --bframes 16 --b-adapt 2 --radl 3 --bframe-bias 20 --hist-scenecut --constrained-intra --b-intra --crf 19 --crqpoffs -4 --cbqpoffs -2 --ipratio 1.6 --pbratio 1.3 --cu-lossless --tskip --psy-rdoq 2.3 --rdoq-level 2 --hevc-aq --qg-size 8 --rd 5 --limit-modes --limit-refs 1 --rskip 1 --rc-lookahead 0 --rect --amp --psy-rd 1.5 --rd-refine --splitrd-skip --rdpenalty 2 --qp-adaptation-range 4 --deblock -1:0 --limit-sao --sao-non-deblock --hash crc --allow-non-conformance --single-sei --y4m - --output ".\v_out.mp4"`

## libx265 CLI, compatible w/ libav fork

- `ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -x265params "tu-intra-depth=4:tu-inter-depth=4:max-tu-size=16:me=umh:subme=0:merange=48:weightb=1:max-merge=4:early-skip=1:mctf=1:ref=3:open-gop=0:min-keyint=5:keyint=0:fades=1:bframes=16:b-adapt=2:radl=3:bframe-bias=20:hist-scenecut=1:constrained-intra=1:b-intra=1:crf=19:crqpoffs=-4:cbqpoffs=-2:ipratio=1.6:pbratio=1.3:cu-lossless=1:tskip=1:psy-rdoq=2.3:rdoq-level=2:hevc-aq=1:qg-size=8:rd=5:limit-modes=1:limit-refs=1:rskip=1:rc-lookahead=0:rect=1:amp=1:psy-rd=1.5:rd-refine=1:splitrd-skip=1:rdpenalty=2:qp-adaptation-range=4:deblock=-1:0:limit-sao=1:sao-non-deblock=1:hash=crc:allow-non-conformance=1:single-sei=1" -c:a copy ".\v_out.mp4"`
- Depth, colorspace:** `-pix_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...`

# Anime·ripper's cold war·HEDT Only

Paused dark flat scenes must look AS-IS, results less & slower compression than sub grps

**splt-trans** --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 4 --limit-tu 1

**srch-cmpns** --me star --subme <24fps=3, 48fps=4, 60fps=5, 100fps=6> --merange 52 --analyze-src-pics --weightb --max-merge 4 --mctf

**ref-rateol** --ref 3 --no-open-gop --min-keyint 1 --keyint <12×fps> --fades --bframes 16 --b-adapt 2 --radl 2

**intra coding** --hist-scenecut --b-intra

**quantization** --crf 16 --crqpoffs -t5 --cbqpoffs -2 --ipratio 1.67 --pbratio 1.33

**lossless qnt** --cu-lossless

**rdoq** --psy-rdoq 2.5 --rdoq-level 2

**aq** --hevc-aq --aq-strength 1.4 --qg-size 8

**md** --rd 5 --limit-refs 0 --rskip 0 --rc-lookahead <2.5 × fps> --rect --amp --no-cutree

**rdo** --psy-rd 1.5 --rd-refine --rdpenalty 2 <EXP: --qp-adaptation-range 5>

**deblock** --deblock -2:-2

**sao** --limit-sao --sao-non-deblock --selective-sao 1

**io** --hash crc --allow-non-conformance --single-sei <NAS streaming: --idr-recovery-sei>

**others** [crop:](#) --display-window < integer "←, ↑, →, ↓" pixels >, [≥16 core cpu opt.:](#) --pme, [interlaced:](#) --field, [pixel depth reduction quality+:](#) --dither, [begin; ending frame:](#) --seek; --frames, [crf/abr resist](#)  
[noise factor:](#) --rc-grain, [target depth:](#) -D 8/10/12, [multi-node:](#) --pools ,,,

## (ffmpeg pipe) x265 CLI parameters

- `ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -an -f yuv4mpegpipe -strict unofficial - | x265.exe --tu-intra-depth 4 --tu-inter-depth 4 --max-tu-size 4 --limit-tu 1 --me-star --subme ○ --merange 52 --analyze-src-pics --weightb --max-merge 4 --mctf --ref 3 --no-open-gop --min-keyint 1 --keyint ○ --fades --bframes 16 --b-adapt 2 --radl 2 --hist-scenecut --b-intra --crf 16 --crqpoffs -5 --cbqpoffs -2 --ipratio 1.67 --pbratio 1.33 --cu-lossless --psy-rdoq 2.5 --rdoq-level 2 --hevc-aq --aq-strength 1.4 --qg-size 8 --rd 5 --limit-refs 0 --rskip 0 --rc-lookahead ○ --rect --amp --no-cutree --psy-rd 1.5 --rd-refine --rdpenalty 2 --qp-adaptation-range 5 --deblock -2:-2 --limit-sao --sao-non-deblock --selective-sao 1 --hash-crc --allow-non-conformance --single-sei --y4m - --output ".\v_out.mp4"`

## libx265 CLI, compatible w/ libav fork

- `ffmpeg.exe -loglevel 16 -hwaccel auto -y -hide_banner -i ".\v_in.mp4" -c:v libx265 -x265params "tu-intra-depth=4:tu-inter-depth=4:max-tu-size=4:limit-tu=1:me=star:subme=○:merange=52:analyze-src-pics=1:weightb=1:max-merge=4:mctf=1:ref=3:open-gop=0:min-keyint=1:keyint=○:fades=1:bframes=16:b-adapt=2:radl=2:hist-scenecut=1:b-intra=1:crf=16:crqpoffs=-5:cbqpoffs=-2:ipratio=1.6:pbratio=1.33:cu-lossless=1:psy-rdoq=2.5:rdoq-level=2:hevc-aq=1:aq-strength=1.4:qg-size=8:rd=5:limit-refs=0:rskip=0:rc-lookahead=○:rect=1:amp=1:cutree=0:psy-rd=1.5:rd-refine=1:rdpenalty=2:qp-adaptation-range=5:deblock=-2:-2:limit-sao=1:sao-non-deblock=1:selective-sao=1:hash=crc:allow-non-conformance=1:single-sei=1" -c:a copy ".\v_out.mp4"`
- Depth, colorspace:** `-pix_fmts yuv420p / yuv422p / yuv444p / yuv420p10 / yuv422p10 / yuv444p10...`