



*Victor Steinberg*

# **VideoQ VQMP**

## **QA/QC Media Player**

*Training Presentation*

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[www.videoq.com](http://www.videoq.com)

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## General




- VideoQ **VQMP**  is a real-time media player that can be used as a stand-alone QA/QC tool or it can work in close co-operation with VideoQ **VQV** \* player-analyzer

<http://www.videoq.com/vqmp.html>

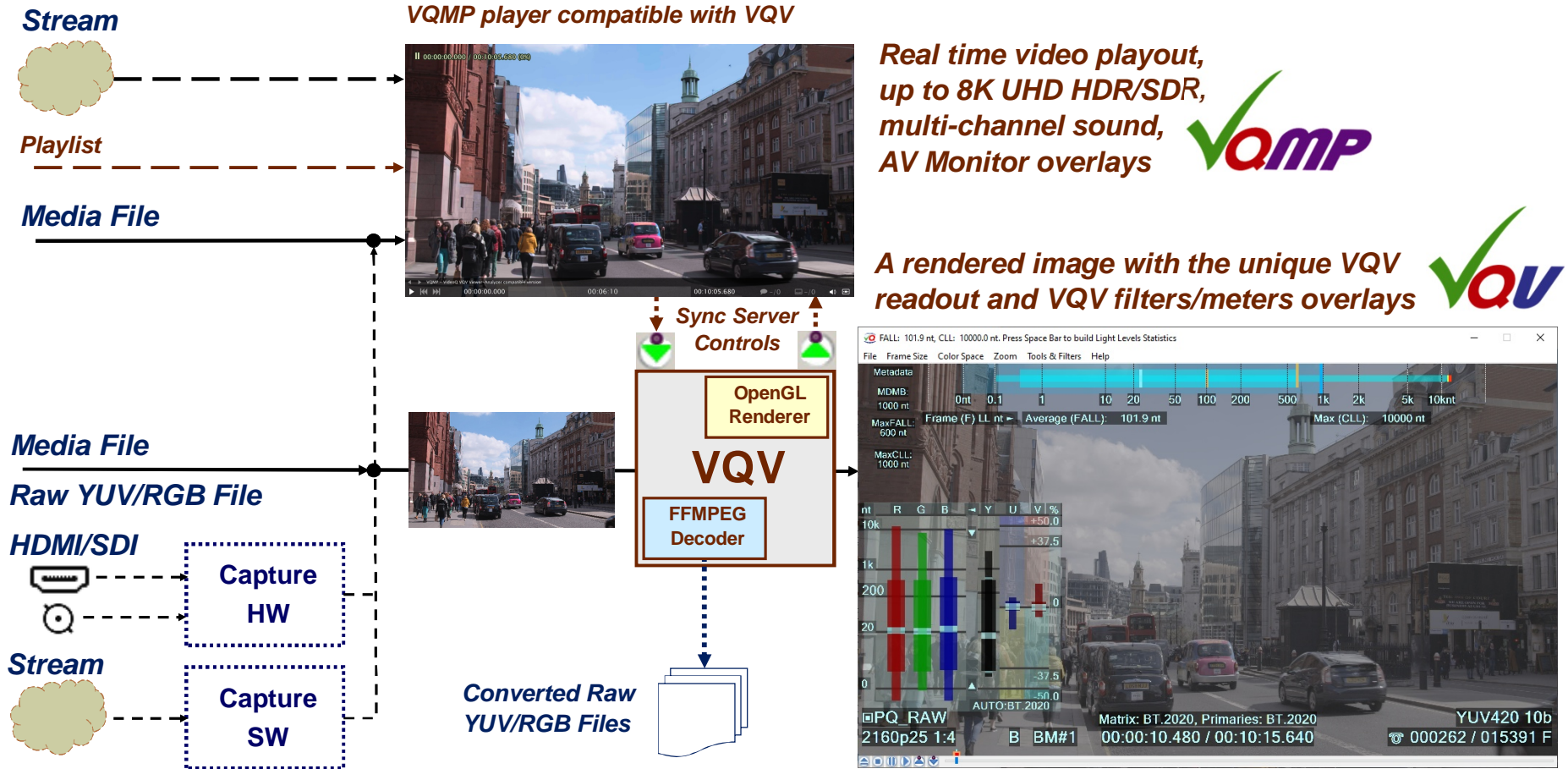
<http://www.videoq.com/vqv.html>

VQMP via built-in server can exchange with VQV short command messages containing:

- Full path to media file
- Timeline position in s.ms format
- VQMP is using **MPV**  core engine and some of MPV keybindings (shortcuts)  
<https://mpv.io>
- VQMP supports a large recent files list, internal and external playlists, multiple internal/external audio/subtitles tracks and timeline bookmarks
- It also features Advanced AV Monitor vitally important for QA/QC functionality

\* For more about VQV see separate presentation

# VQMP & VQV – Top Level Workflow Diagram



UHD HDR10 sample video – courtesy of newsbyte.co.uk

# VQMP Features



- Real time media player combining minimalistic GUI (OSC = On-Screen Controller pop-up bar) with intuitive keyboard/mouse/overlay controls
- Powerful ffmpeg-based hardware-accelerated rendering and decoder that supports nearly all media formats, up to 8K UHD HDR/SDR
- HDR (PQ and HLG) to SDR conversion for easy HDR preview on SDR screen
- Multi-channel audio rendering engine, up to 7.1 surround sound
- Fast intuitive timeline navigation, including switchable messages and GoTo Manager
- Smart speed/scale/zoom/pan controls with info overlays
- Smart file opening, including configurable use of last-used timeline position and track controls
- Playlist Manager with editing controls
- Recent Files Manager with editing controls
- Smart video, audio and subtitle tracks selection
- Advanced AV Monitor overlays, various modes of operation

# VQMP Command Line Interface & Usage Info Helper

Enter **VQMP** without any **CLI parameters** to bring up **Short Guide** image (**Start Page**) showing **Main Shortcuts**.

Launching VQMP executable with **-h flag**, brings up the following help message:

Usage:

**VQMP [-h] [InFileName] [TimePosition\_s]**

Use VQMP **without optional components** to launch VQMP showing **Short Guide** (static image)

InFileName option: specify Full Path to the **media file** or **URL**

**TimePosition\_s** option: specify timeline position in s.ms. Default: 0.0

**VQMP.EXE** must be co-sited with **VQMP\_.EXE** and other files of **VQMP package**

Use **-h flag** option to display this help message in **Windows console**

## ---- Opening URL ----

If InFileName = **URL**, e.g. "**https://z001-stream...**" the VQMP **OSD** (On-screen Display) **timeline 0s** starts at the **batch launch**, which corresponds to a **random position** within the incoming **live stream**, thus [TimePosition\_s] option ***should not be used***.

## ---- Receiving AV stream over UDP or SRT protocol ----

VQMP can work with **explicit network address**: **vqmp "udp://192.168.0.47:32768"**

Alternatively, VQMP may receive AV data from "**localhost**" address: **vqmp "udp://localhost:32768"**

# VQMP Start Page – Main Shortcuts Short Guide



[www.videoq.com](http://www.videoq.com)

**Shift+Up/Down, Shift+Mouse\_Wheel** - Window Size

**Alt+Up/Down, Alt+Mouse\_Wheel** - Zoom

**v, a, s** - Video, Audio, Subtitles Track

**Alt+1,2,3,4** - AV Monitor Mode

**Esc** - AV Monitor Off

**F1** - Help

**Ctrl+o** - Open File

**Ctrl+u** - Open URL

**Ctrl+r** - Recent Files

**Ctrl+p** - Playlist

**F6** - Full Path

**F7** - Title/FileName

**F8** - Track List

**F9** - Window Size & Zoom

**MBTN\_RIGHT, t** - osd level

**g** - GoTo Manager

**9/0, Ctrl+ Mouse\_Wheel** - Volume

**m, Alt+MBTN\_MID** - Mute

**Alt+0** - AV Monitor On

**Esc** - AV Monitor Off

L R C LFE Ls/Lrs Rs/Rrs Ls Rs





# VQV and VQMP Synchronization





**VQV** is a **master control point**, launching **VQMP** player (and sync server running in the background) as needed. Video files can be opened in VQV and/or in VQMP, so there are **several cases**:

- VQV and VQMP render **the same file**, possibly at different *timeline positions*.
- VQV and VQMP render **two different files**, even of two different types, e.g., video file by VQV, audio file by VQMP

In any case, VQV can exchange with VQMP short command messages containing:

- Full path to media file
- Timeline position in s.ms format

Click on **VQV**  button or use **Ctrl+ Up Arrow** to send message **from VQV to VQMP**

Click on **VQV**  button or use **Ctrl+ Down Arrow** to request and receive message **from VQMP to VQV**

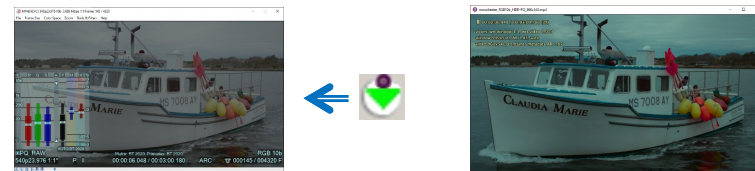
Idle VQV **launches** idle VQMP (server initialization only)



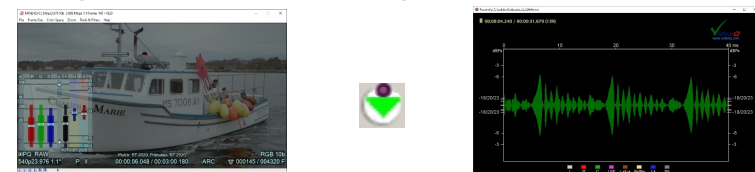
VQV **sends** to VQMP current file path and timeline position





VQV **requests and receives** from VQMP file path and timeline position



**Special case:** VQV can not open audio file, but VQMP can

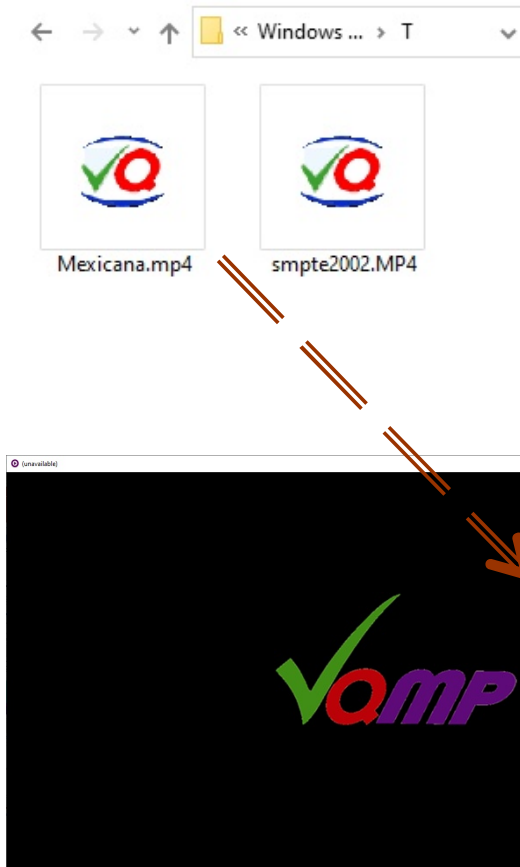


# Keybindings – Keyboard and Mouse Controls

- The default keybindings are included into the original mpv  core engine.
- See <https://mpv.io> for full list of original built-in mpv keybindings.
- Some built-in mpv keybindings are still in use by VideoQ VQMP, some of them disabled, and some others replaced by VQMP  keybindings.
- Majority of VQMP shortcuts use lower-case keys
- All upper-case keys mentioned below mean Shift+key.
- Dynamic keybindings are valid only while the related mode is active
- Press **F1** to open the VQMP keybindings list document in WordPad
- See next slides for the detailed description of VQMP controls and shortcuts



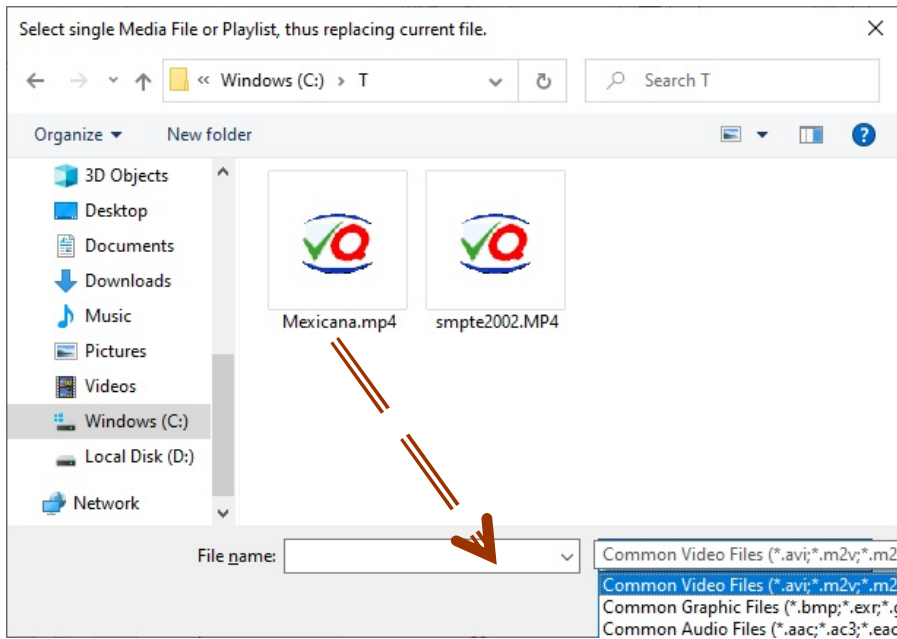
# Opening Media File via Drag-And-Drop



VQMP supports Windows OS **drag-and-drop** (quick & easy) procedure.  
*Note that if “quit-watch-later” option was not disabled on previous exit, the last-used timeline positions and other controls stored for this file will be auto-applied.*



# File Manager Controls 1



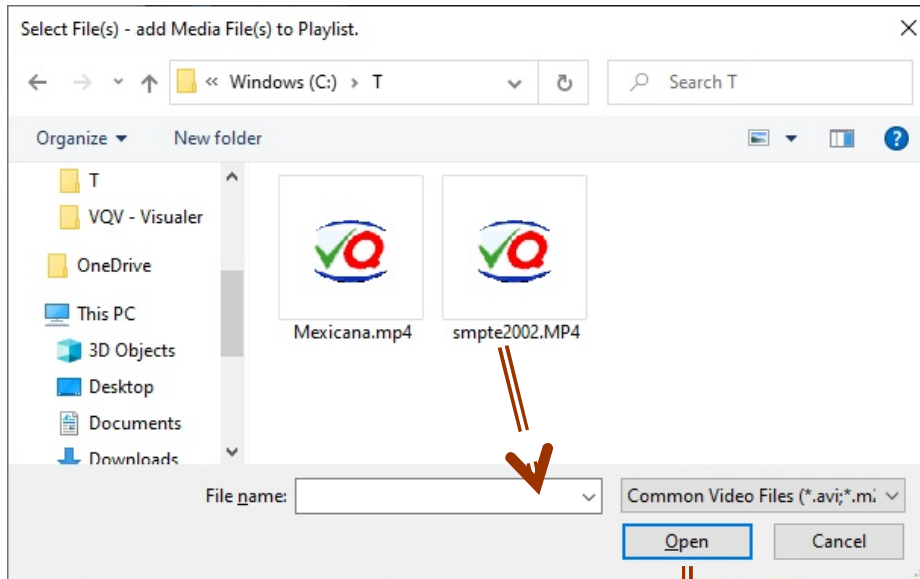
**Ctrl+ o** brings up standard File Open Dialog, the selected file or playlist will **replace** currently playing file or playlist.

New media file will be automatically included in **recent files list**. Also this operation will auto-reduce **internal playlist table** to just one item – new file.

*Note that the upper-case “Ctrl+ O” should not be used.*



## File Manager Controls 2



**Internal playlist**

**Ctrl+ a** brings up Add File Dialog.

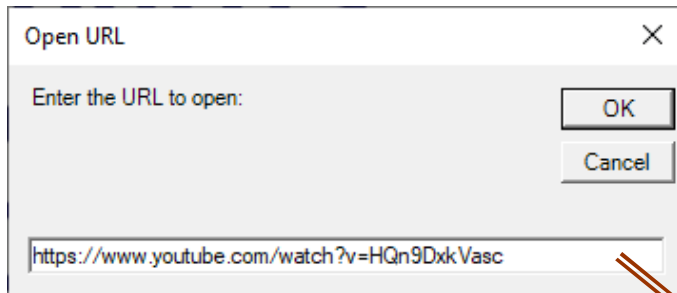
The selected “*smpte2002.MP4*” file will be **appended** to the **internal playlist table**.

Currently playing file will **continue to play**.

*Note that the upper-case “Ctrl+ A” should not be used.*



## File Manager Controls 3




**Ctrl+ u** opens URL text edit box pop-up. Paste your URL into it.

*Note that the upper-case “Ctrl+ U” should not be used.*

<https://www.youtube.com/watch?v=HQn9DxkVasc>

**Victor Steinberg,  
Roderick Snell**


**Video Standards**  
Signals, Formats and Interfaces  
**Part 10**  
HDR Video Flavors & Inconvenient Truth

 [www.videoq.com](http://www.videoq.com)


**Alt+ a** opens **Add Subtitles File** dialog, the selected file will be **appended** to the **internal subtitles list table**.  
Currently playing file will continue to play.



# Classic Playout Controls

Use **Space** or **p** or **Mouse Middle Button** or  symbol of OSC (On-Screen Controller pop-up bar) to toggle pause/play.  
Use **q** or **Q** to quit and watch later: save timeline position and quit.

OSD (On-Screen Display) info message showing current **timeline position**, **duration** and **relative position** percentage.



The screenshot shows a video player window titled 'Mexicana.mp4'. The video content displays two women standing behind a table with food and flowers in a park-like setting. The OSD (On-Screen Display) at the top of the video frame shows a play/pause symbol, a timeline position of 00:00:50.680, a duration of 00:06:55.123, and a relative position of 12%. Below the video frame is a control bar with several elements: a play/pause button, a timeline slider, an audio tracks control (3/9), and a subtitle tracks control (-/0). Annotations with dashed purple arrows point to these controls and other features:

- Currently playing file name:** Points to the window title 'Mexicana.mp4'.
- Play/pause symbol:** Points to the play/pause icon in the OSD.
- Previous/Next Chapter:** Points to the left and right arrow icons in the control bar.
- Previous/Next file of the Playlist:** Points to the double left and double right arrow icons in the control bar.
- Play/Pause:** Points to the play/pause button in the control bar.
- OSC (On-Screen Controller pop-up bar):** Points to the OSD area.
- Timeline Slider:** Points to the progress bar in the control bar.
- Audio Tracks Control:** Points to the '3/9' indicator in the control bar.
- Subtitle Tracks Control:** Points to the '-/0' indicator in the control bar.
- Mute Control:** Points to the speaker icon in the control bar.
- Fullscreen Mode ON/OFF:** Points to the fullscreen icon in the control bar.

# Recent Files Manager

**Ctrl+ r** toggles the **Recent Files List** overlay ON/OFF.

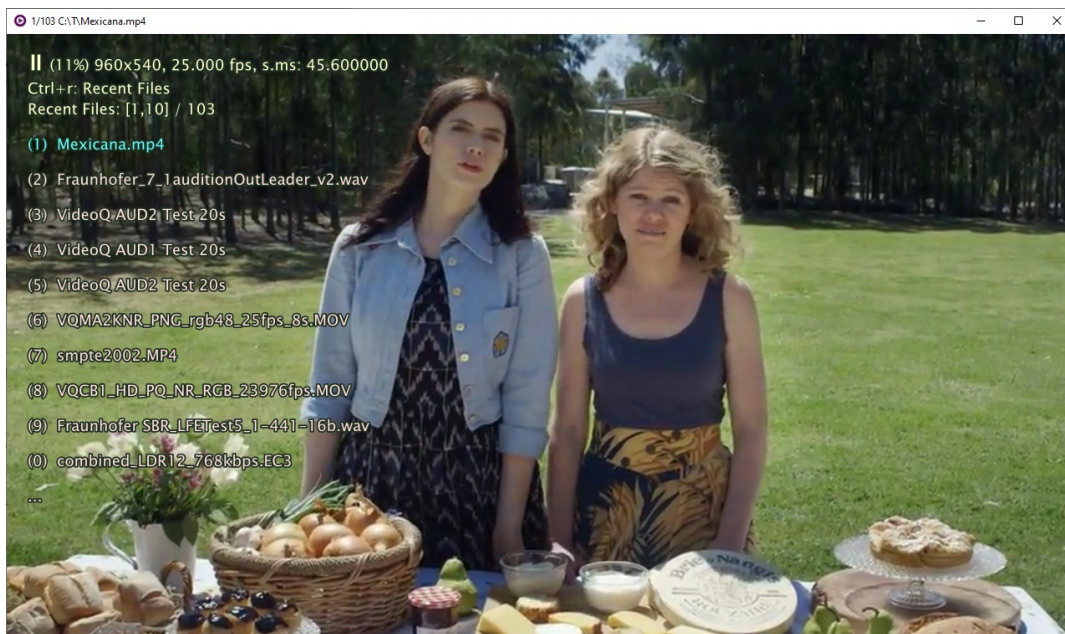
List size is unlimited, but the list is subdivided into pages, showing no more than 10 items at a time.

Use **Enter**, **Mouse Left Button** or digits **1 - 9**, or **0** to select the file from the list.

Use **Up/Down Arrows** or **Mouse Wheel** to scroll the list, one item at a time.

Use **PageUp/PageDown** to scroll the list, one page (10 items) at a time.

**Del** deletes item from the list, **Esc** switches list display OFF.



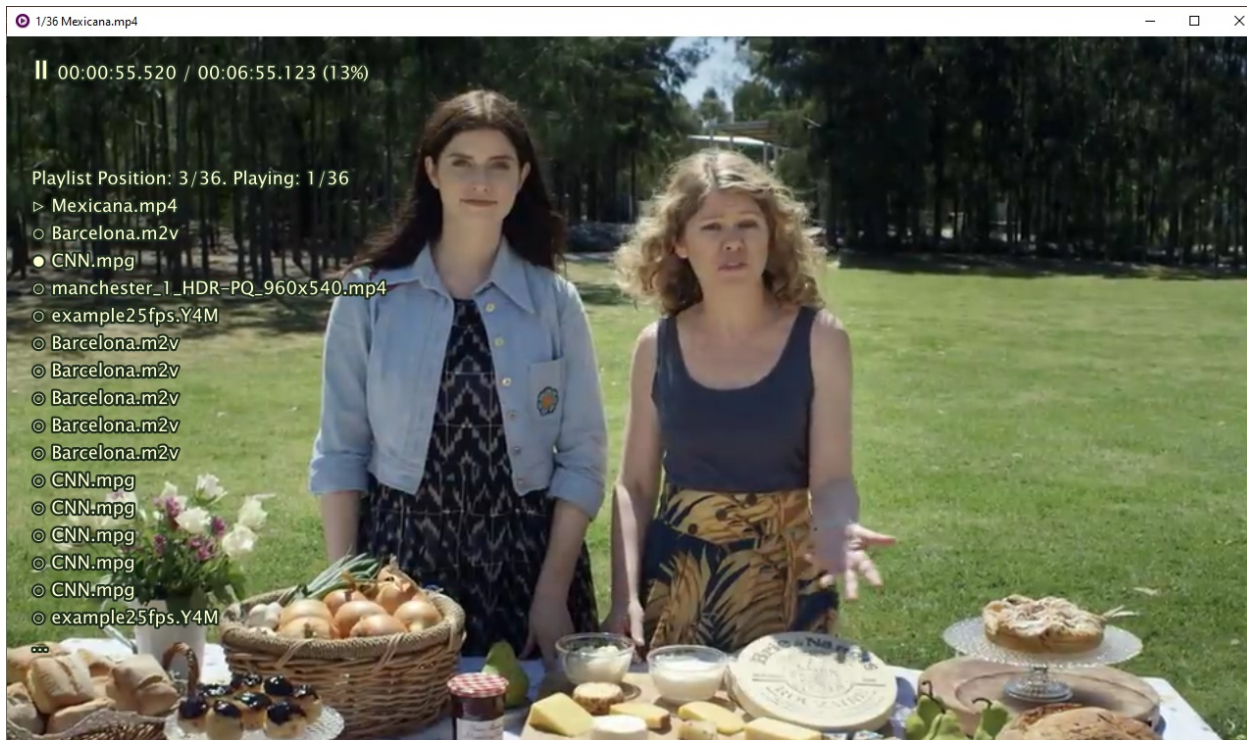
*Note that Recent Files Manager and Playlist Manager are mutually exclusive.*

*Thus, if **Playlist Files Manager** was used, then launch of **Recent Files Manager** will auto-reduce playlist to just one item - currently playing file.*

# Playlist Manager 1

**Ctrl+ p** brings up the **Playlist** overlay. List size is unlimited, but the displayed section is limited by VQMP window size.

*See next two slides for item selection types, playlist navigation, modification and saving options.*



*Note that Recent Files Manager and Playlist Manager are mutually exclusive.*

*Thus, if **Playlist Files Manager** was used, then launch of **Recent Files Manager** will auto-reduce playlist to just one item - currently playing file.*

*You can select multiple media files in the Explorer and drag-and-drop them. In such case new playlist will be created, thus replacing the current list.*

*In absence of user actions, playlist display will auto-hide after the preconfigured OSD delay, e.g. 4000ms.*



## Playlist Manager 2

If **URL media titles** are available, they are shown as **playlist items**, otherwise **file names** or **URLs** are displayed.

While the playlist is **displayed**, the following **selection** and **modification** controls are active:

**Up/Down Arrows** or **Mouse Wheel**:

- if no item selected: scroll the list -- move the cursor up/down with wrap-around at the list end
- for the selected item: move its position in the list with wrap-around at the list end

**Left/Right Arrows** or **Mouse Right Button** modify the **selection type** and list's bullet point **shape**:

- – default (any item, except the selected or playing item)
- – hovered item (the item that can be played or selected)
- ➔ – the selected item
- ▷ – item is currently playing, but not hovered, nor selected
- ▶ – the hovered item is currently playing
- – the selected file is currently playing

**Enter** or click **Mouse Left Button**: auto-select and play the item at the current cursor position

**Del** – deletes the **hovered** item from the list (selected or not selected).



# Playlist Manager 3

If playlist count > 1, then the following dynamic keybindings are active:

**Enter** plays next item in the playlist

**<** or **Ctrl+ ,** plays previous item in the playlist

**>** or **Ctrl+ .** plays next item in the playlist

Playlist mode **ON**

Playlist mode **OFF**

High-lighted top row arrow symbols within the OSC Bar indicate the **playlist count > 1**, i.e. **Playlist Mode ON**.



**Ctrl+ P** saves playlist in **.m3u** UTF-8 format.

Saved **playlist file name** is created **automatically** (*no file name edit dialog*);

saving **location** is **fixed** (pre-defined folder): “**.\playlists** “; saved file can be renamed, copied or moved for further use.

**Ctrl+ Backspace** clears the playlist, except the currently playing file, i.e. playlist is **reduced** to the **currently playing item**.

**Ctrl+ Del** deletes playlist table **completely** and forces VQMP engine to display **start page**:



# Playlist Manager 4

**Ctrl+ I** (lower-case "L" key) auto-updates or creates the **internal playlist table**, which can be saved later.

VQMP will search the folder containing the **currently playing file** and append **all files of all supported formats to the playlist**.

Besides regular playlist mode there is a special "**Playlist Scan Mode**".

By default it is ON.

In this mode each file is opened for just **12 seconds**, **AV Monitor** and **text messages** show its video and audio parameters. This mode is handy for fast preview of large number of media files.

For example, to preview **all files in the folder** press **Ctrl+ I** (to create temporary volatile playlist), playout starts automatically. At any moment press **Ctrl+ Backspace** to delete the temporary playlist and start detailed analysis of currently playing file.

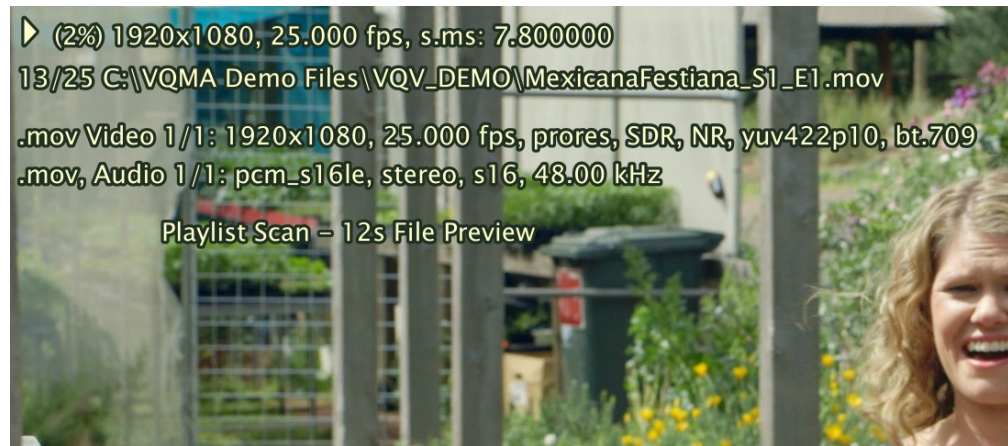
- Alt+ v** switch Playlist Scan Mode ON
- Ctrl+ v** switch Playlist Scan Mode OFF

PlayList Mode Fast Scan Preview ON

PlayList Mode Fast Scan Preview OFF

PlayList Mode ON  
Fast Scan Preview OFF

PlayList Mode ON  
Fast Scan Preview ON



# Timeline Navigation Controls 1

There are several ways to control the timeline position.

## General Timeline Navigation Controls:

To pause and seek the desired **relative** position use the following shortcuts:

- . (dot) or , (comma) or **Mouse Wheel** +/- 1 frame
- **TAB** +/- 1s
- **Ctrl+ TAB** +/- 10s
- **PageUp/PageDown** +/- 60s (1m)
- **Shift+ PageUp/PageDown** +/- 600s (10m)

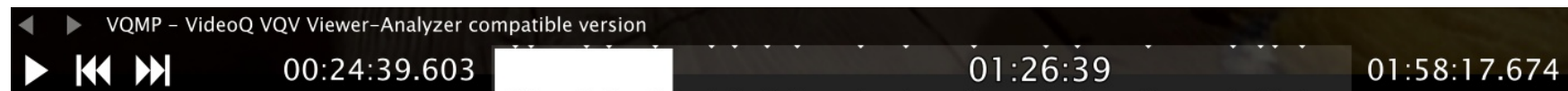
Alternatively, use the **slider strip** within the **OSC Bar** (*Note that clicking/dragging this slider does not force pause*).

In pause mode dragging the slider bar provides for fast preview of the visual content with on-the-fly timecode display.

*Note that the OSC Bar slider **precision** is limited to a few seconds; it is not enough for long duration file QA/QC purposes.*

Press **O** to cycle OSC Bar **visibility**: "auto" (default), "always", "never".

In auto-visibility mode OSC appears when mouse is in the bottom 25% of the video image.



## Timeline Navigation Controls 2

### Loop Controls:

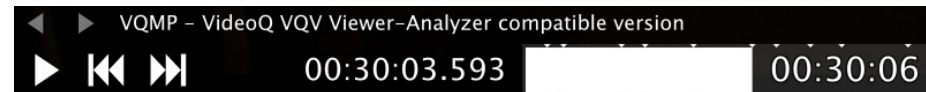
**I** (lower-case "L" key) Set/clear **A-B Loop** points: 'Set A', 'Set B (AB Loop Mode active)', 'Clear A&B'

**L** Toggle **File Loop** playout mode: "inf" (default, except the playlist mode) or "no"

*Note that in regular playlist mode selecting "inf" prevents jumping to next playlist file after previous file ends.*

### Chapter Navigation Controls:

**Ctrl+ PageUp/PageDown** Next / previous chapter



*Click on double-arrow symbol within the OSC Bar to see chapter list overlay. If currently playing file **metadata** include **chapter list**, then these symbols are **activated** (highlighted) and chapter markers (small white triangles) added to the slider bar.*

### Bookmark Manager Controls:

User can store and recall up to 4 **permanent bookmarks** (store, see and recall **file path** and **timeline position**).

**Ctrl+ 1,2,3,4** Set (store) bookmark #1,#2,#3,#4

**Ctrl+Alt+ 1,2,3,4** Recall (load) bookmark #1,#2,#3,#4

**Ctrl+Alt+0** Peek (preview) all 4 bookmarks: #1,#2,#3,#4

*Peek here means display the media title/filename/URL and seek position saved in the bookmark slot.*

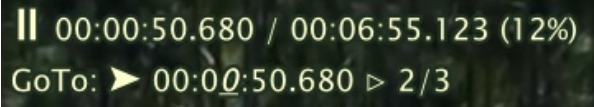
**Ctrl+Shift+ Backspace** Set one "revert-seek" mark

*This is the **single volatile bookmark**, i.e. the timeline position for revert-seek, valid only for the currently playing file.*

**Shift+ Backspace** Toggle between the "revert-seek" marked position and last used timeline position.

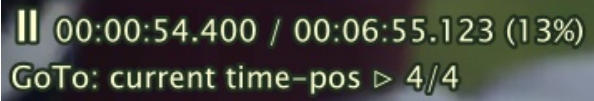
## GoTo Manager Controls

**g** Toggle editable 'GoTo' **timecode string** overlay



|| 00:00:50.680 / 00:06:55.123 (12%)  
GoTo: ▶ 00:00:50.680 ▷ 2/3

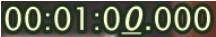
**b** Store **current timeline position** as GoTo record (volatile bookmark)



|| 00:00:54.400 / 00:06:55.123 (13%)  
GoTo: current time-pos ▷ 4/4

*GoTo Manager dynamic keybindings:*

**Left/Right Arrows** Move to previous/next digit position (*underline italic*)



00:01:00.000

**0 - 9** Enter current digit and move right to next digit

**Backspace** Clear current digit (set 0), then go left to previous digit

**Up/Down Arrows** Scroll through the **GoTo history**, numbers after  symbol show **current record / record count**

**Esc** Cancel current timecode string editing and remove the overlay

**Enter** Seek to the displayed **absolute** timeline position 

*GoTo Manager **history list** size is practically unlimited, and it can be used for setting up very handy **editable volatile bookmarks**, valid across multiple media files, e.g. Recent Files, but they are valid only whilst the VQMP instance is running.*

# Window Controls

## General Window Controls:

**f** or **Mouse Double Click**  
**Esc**

Toggle full screen mode ON/OFF  
Switch full screen mode OFF

**T**  
**Ctrl+ N**  
**Ctrl+ R**

Toggle VQMP window staying on top of other windows, default value is "no"  
Create new VQMP instance with empty playlist (start page)  
Re-open (close and open the same file)

**Ctrl+ A**

Cycle the rendered video **aspect ratios**: "16:9", "1.85", "2.0", "2.2", "2.35", "2.39", "4:3", "-1", "no"  
"-1" means the container/stream metadata aspect ratio, i.e. "auto mode",  
"no" means that aspect ratio defaults to unscaled video width/height, i.e. "square pixels mode".

**Ctrl+Alt+ a**

Toggle the aspect ratio **metadata source**: **container/stream**

## Window Size Controls:

Except full screen mode, **active video image always fits the VQMP window boundaries**, thus window size controls indirectly change **window scaling** and **zoom factor** with reference to the **original video frame size**.

**Shift+ Up/Down Arrows**  
**F9**

```
zoom: wrt window 1:1, wrt video 1.85:1  
window 1779x1001, AR 1.78, auto  
video 960x540, container metadata AR 1.78
```

Enlarge/shrink VQMP window (you can also use **Shift+ Mouse Wheel**)  
Brings up text message overlay showing window size, video size, and zoom values  
Max window size is limited by screen size, min window height = 480 pixels.  
You can use **mouse dragging** for classic OS window size/position change **without any restrictions**, but scaling and zoom values will be hard to control and monitor.

**w, W, Ctrl+ w**

Reset all window size & zoom related parameters



# Zoom and Pan Controls

The controls listed below affect only **active video image**, window size remains **unchanged**.

Note that the "**smart limits**" of the Zoom and Pan controls depend on **video frame size** and **current window size**.

**Alt+ Up/Down Arrows**

Increase/decrease zoom factor: 1:1, 2:1, 4:1, 8:1, 16:1 (you can also use **Alt+ Mouse Wheel**)

**z, Z, Ctrl+ z**

Reset video zoom & pan controls

**Ctrl+ Left/Right Arrows**

Move (H pan) visible image within the window

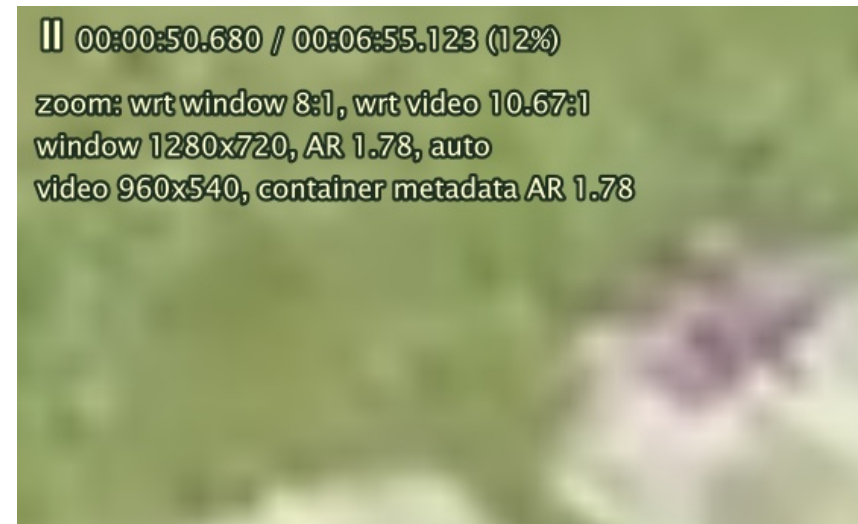
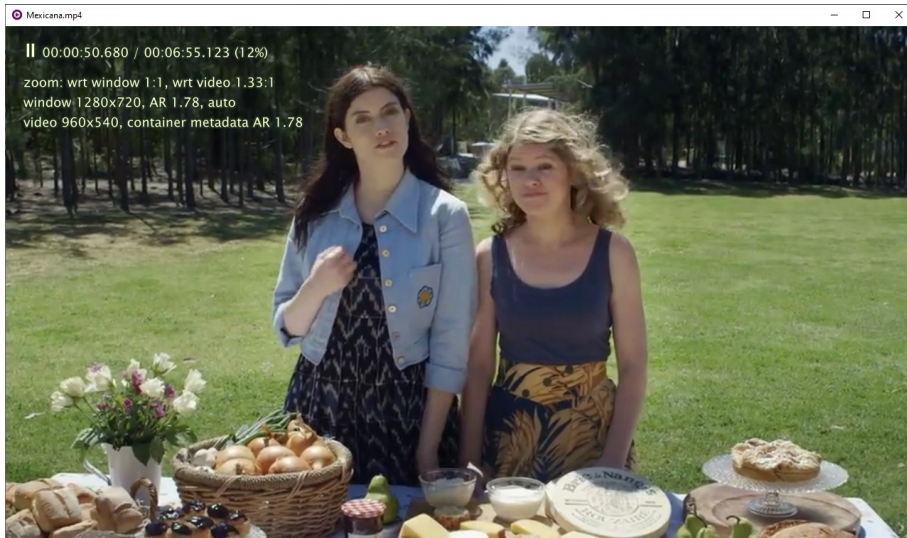
**Ctrl+ Up/Down Arrows**

Move (V pan) visible image within the window

**F9**

Show window size, video size, and zoom values.

```
pan %: x +50.0 y -29.3  
zoom 4:1
```



# On-screen Display (OSD) Controls

**t** or **Mouse Right Button**

Cycle osd-level 3, 2, 1, 0 (*modify the content of the topmost message line*)

osd-level 3 (default):

current timecode / duration timecode

|| 00:06:04.440 / 00:06:55.123 (88%)

osd-level 2:

current frame number / frame count, speed

|| (88%) frame 9111 / 10378 speed 1.00

osd-level 1:

frame size, frame rate, time position in s.ms

|| (88%) 960x540, 25.000 fps, s.ms: 364.440000

All 3 variants also include play/pause/seek/wait symbol and time position in %.

For **audio files** and **AV Monitor overlays** the osd-level selection is fixed: **osd-level 3**.

Selection of **osd-level 0** means that not only the topmost line, but nearly all osd messages will be hidden: **timeline messages OFF**

*Important note: VQMP scripts may override this control by forcing the pre-defined osd-level: 1, 2 or 3.*

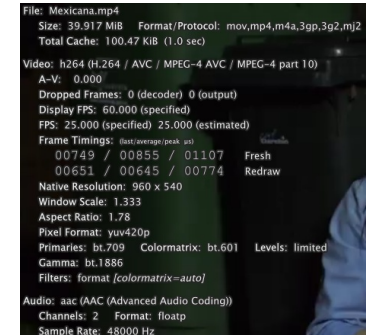
**o, P** Short time display of **progress bar** (absolute time position) overlay



**i** Short time display of **status info** page (aka "stats") overlay

**I** Toggle **permanent display** of **status info** page (aka "stats")

*While in "stats" mode 1, 2, 3, 4 keys can be used to browse 4 info pages*



**F6** Short time display of **path + filename** or **URL**

**F7** Short time display of **media-title** (e.g., of URL) or **filename**

**F8** Short time display of video/audio/sub **tracks list**  
*with language and short description tags – if available*

**F9** Short time display of **window/zoom parameters**

**F10** Cycle the **osd duration** values: 2s, 4s (default), 8s



# Other Controls 1

## Sound Volume Controls:

**m** or **Alt+ Mouse Middle Button**

Toggle **mute** ON/OFF

*Default value of Mute control is OFF (reset for each new file opened)*

**0 / 9** or **Ctrl+ Mouse Wheel**

Increase/decrease **volume**

*Default volume value is 50% (reset for each new file opened)*

## Playback Speed Controls:

**]** or **Ctrl+Alt+ f**

Increase **speed**: .05, .15, .3, .5, 1, 2, 3, 4, 10, 20

*Note that **audio** rendering is possible only*

**[** or **Ctrl+Alt+ s**

Decrease **speed**: 20, 10, 4, 3, 2, 1, .5, .3, .15, .05

*for speed values from **0.3** to **4***

**{ / }**

Set play direction **backward / forward**

**Backspace**

Reset speed controls to default values: speed = 1, play direction = forward

## Video Image Controls:

**2 / 1**

Increase/decrease **contrast**

**4 / 3**

Increase/decrease **brightness**

**6 / 5**

Increase/decrease **gamma**

**8 / 7**

Increase/decrease **color saturation**

**Alt+ s**

Select **BT.601** (SD) color matrix

**Alt+ n**

Select video data **Narrow Range** (YUV input data default)

**Alt+ h**

Select **BT.709** (HD) color matrix

**Alt+ f**

Select video data **Full Range** (RGB input data default)

**Alt+ u**

Select **BT.2020** (UHD) color matrix

*By default, color matrix, video data range and dynamic range mode (SDR, HDR-PQ, HDR-HLG) selection is **automatic**.*

## Other Controls 2

### Video/Audio/Subtitles Track Selection Controls:

- a** Cycle through **audio tracks**
- v** Cycle through **video tracks**
- s, j** Cycle through **subtitles tracks**
- J** Cycle through **subtitles tracks** backwards

### Subtitle Controls:

- Ctrl+Alt+ Left/Right Arrow** pause and go to previous/next **subtitle position**  
*Note that going to previous/next pre-fetched subtitle position also changes video and audio timeline positions.*

- S** Cycle subtitles **scale** (size): 1. (default) 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, .5, .6, .7, .8, .9
- r / R** Move subtitles **up/down**

### Misc. Controls:

- =** or **Shift+ Mouse Middle Button** **Reset** all AV control values: (video, audio, subtitles, speed)

- F1** Open the **VQMP keybindings** (help) document in WordPad

You can save JPG screenshots in the pre-defined “.\screenshots “ directory:

- Ctrl+ s** Save **scaled video screenshot** with subtitles and OSD
- Ctrl+ S** Save **unscaled video screenshot** without subtitles and majority of OSD messages

# AV Monitor Modes

Press **Alt+ 1 | 2 | 3 | 4** to pre-select or select the corresponding AV Monitor Mode.

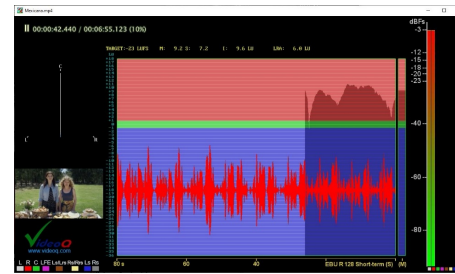
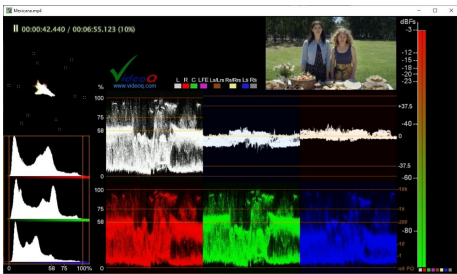
## Mode 1

## Mode 2

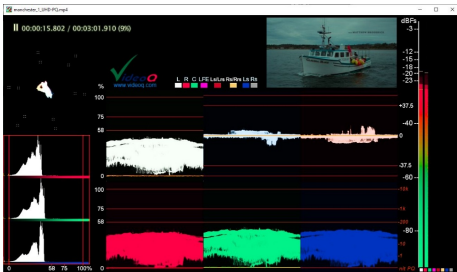
## Mode 3

## Mode 4

### SDR Content



### HDR-PQ Content



Video tools: **UV Vectorscope, RGB Histograms, YUV Waveforms, RGB Waveforms**

Audio tools: **Level Meter, Vectorscope, Frequency Spectrum, EBU R128 Monitor**

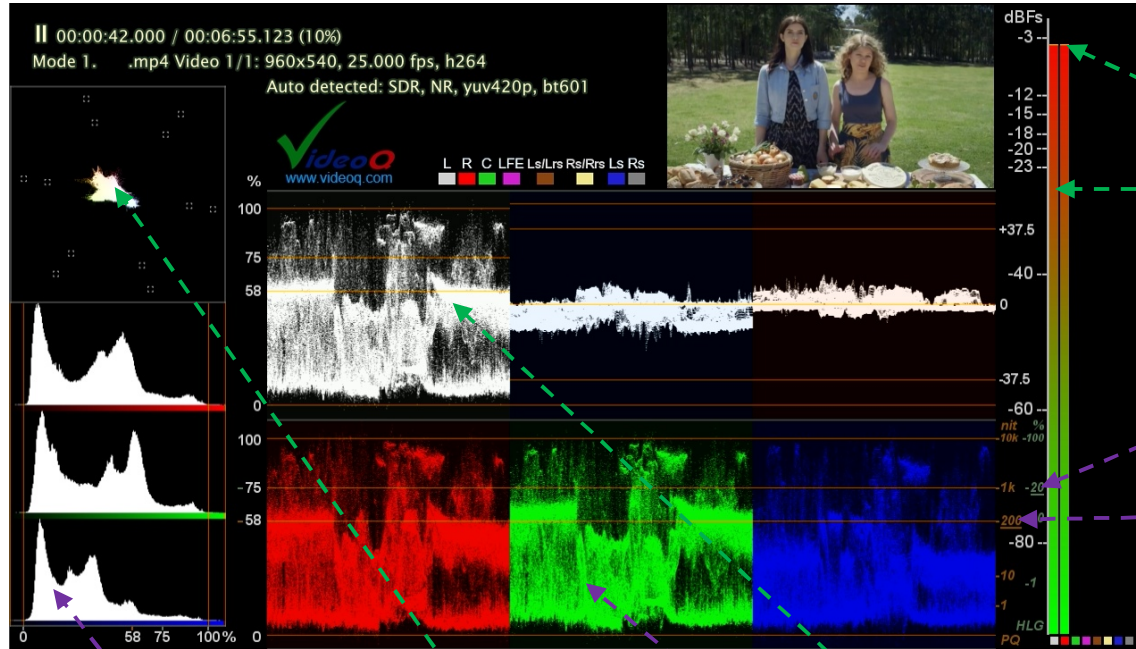
See next slides for more details about AV Monitor features and modes.

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# AV Monitor Mode 1

Press **Alt+ 0** to switch **AV Monitor ON**, **Esc** to switch it OFF, or **Ctrl+ Mouse Middle Button** to toggle **AV Monitor ON/OFF**

Press **Alt+ 1** to select the **AV Monitor Mode 1**



**Audio Peak Markers**

**Log scale (dBFs) Audio Level Meter.**  
*Note that for this example LR stereo is in fact dual-mono, both channel levels are identical.*

**HDR-HLG Light Levels Scale**  
 and

**HDR-PQ Light Levels Scale**  
 values in **nits PQ** and **% HLG**

*The scheme below shows short codenames and color tags of audio channels.*

*This color scheme is also used for audio waveforms – **Z order** of channel **overlays**.*

RGB NR/FR Histograms

UV Vectorscope

YUV NR/FR Waveforms  
 RGB NR/FR Waveforms

**Alt+ n | Alt+ f** switches between video data **Narrow | Full Range**

**2.0, 5.1, 7.1 Audio Formats:**  
**Channels Order and Color Scheme**



# AV Monitor Mode 2

Press **Alt+ 0** to switch **AV Monitor ON**, **Esc** to switch it OFF, or **Ctrl+ Mouse Middle Button** to toggle **AV Monitor ON/OFF**

Large slightly down-scaled video image

Press **Alt+ 2** to select the **AV Monitor Mode 2**



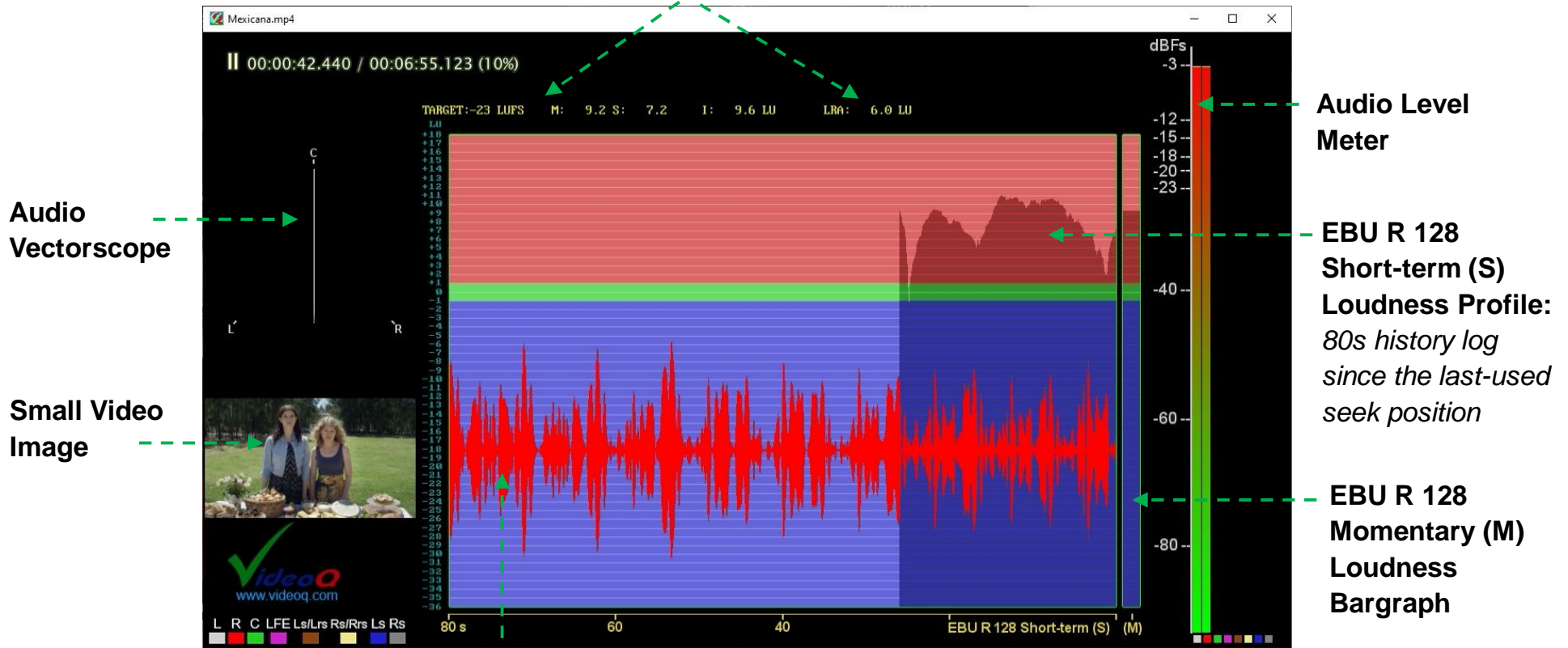


# AV Monitor Mode 3

Press **Alt+ 0** to switch **AV Monitor ON**, **Esc** to switch it OFF, or **Ctrl+ Mouse Middle Button** to toggle **AV Monitor ON/OFF**

**EBU R 128 Meter** loudness values (**M, S, I** and **LRA**)

Press **Alt+ 3** to select the **AV Monitor Mode 3**



**Audio Waveform Monitor**

# AV Monitor Mode 4

Press **Alt+ 0** to switch **AV Monitor** ON, **Esc** to switch it OFF, or **Ctrl+ Mouse Middle Button** to toggle **AV Monitor** ON/OFF

For **video files with internal or external audio streams**  
AV Monitor Mode 4 is **auto-ON** for each new file opened.

In **any AV Monitor Mode**:  
Press **Alt+ 4** to select the **AV Monitor Mode 4**



# AV Monitor Controls 1

For video files with internal or external audio streams:

<b>Alt+ 0</b>	Switch AV Monitor ON
<b>Ctrl+ Mouse Middle Button</b>	Toggle AV Monitor ON/OFF
<b>Alt+ 1   2   3   4</b>	Pre-select or select one of 4 Modes
<b>M</b>	Cycle thru AV Monitor Modes 1,2,3,4:
<b>ESC</b> (dynamic keybinding)	Switch AV Monitor OFF

For video only files without internal or external audio streams

*Note that in this case, you can only switch the AV Monitor **Mode 1** ON/OFF, using the keys shown above. Audio Levels Meter will show “-inf” dBFS value.*



## AV Monitor Controls 2

### For audio files

Note that for **audio files** AV Monitor is **always enabled**, you can only **switch** between **2 special modes**.

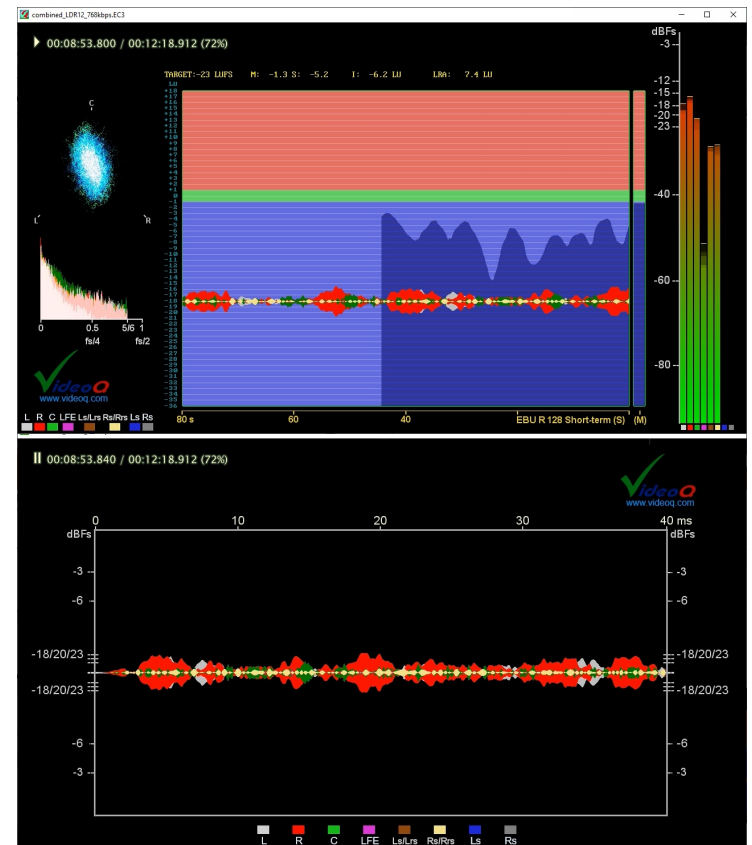
**M** or **Ctrl+ Mouse Middle Button** toggles between 2 modes:

- **AV Monitor Mode 3a**

This mode is **auto-ON** for each new audio file opened.

- **Large Audio Waveform Monitor**

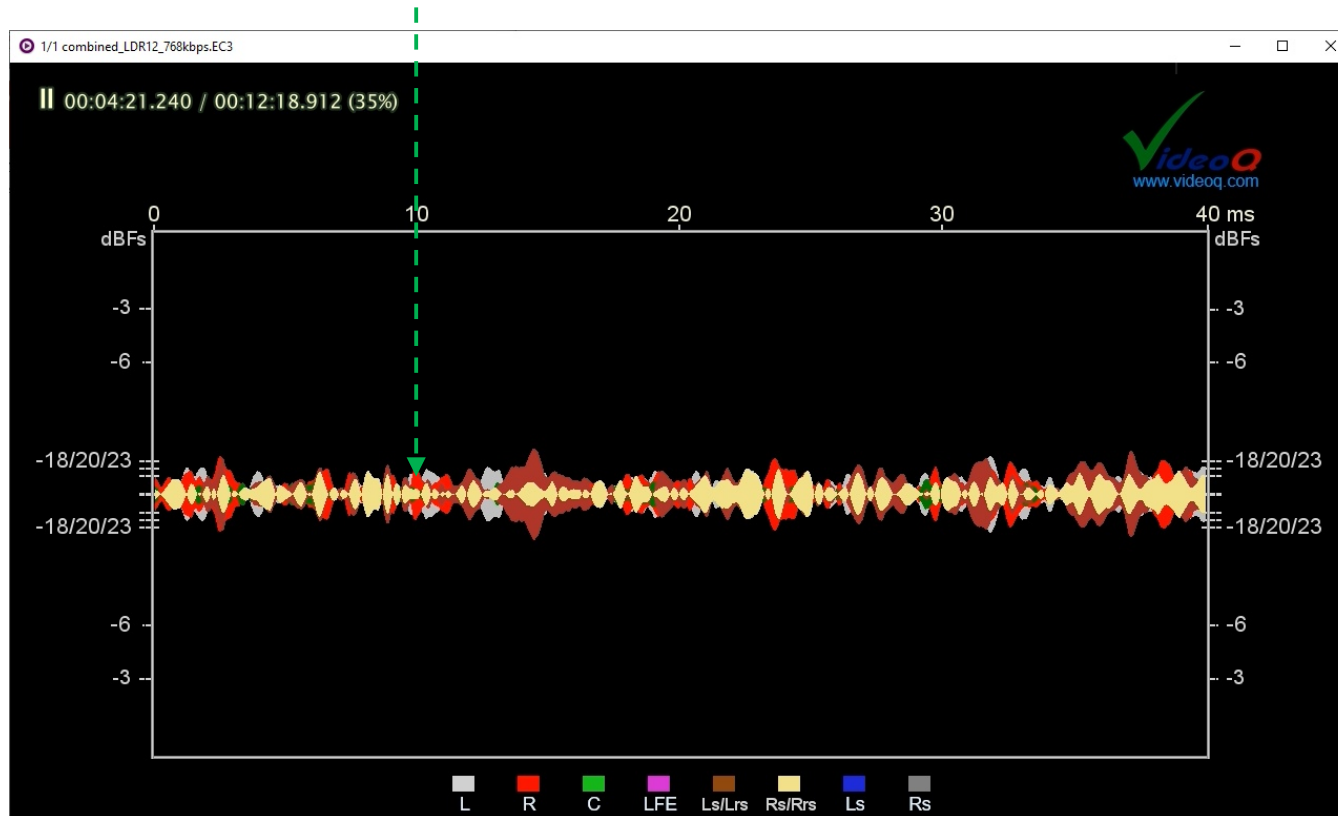
(special mode available only for audio files)



# Audio Waveform Monitor Example

If input is an **audio file**, press **M** to toggle between Advanced Audio Monitor and Audio Waveform Monitor modes.

In this example **Waveform Monitor** shows that all 5.1 audio channel colors **are different**. *Looks like good professional job.*

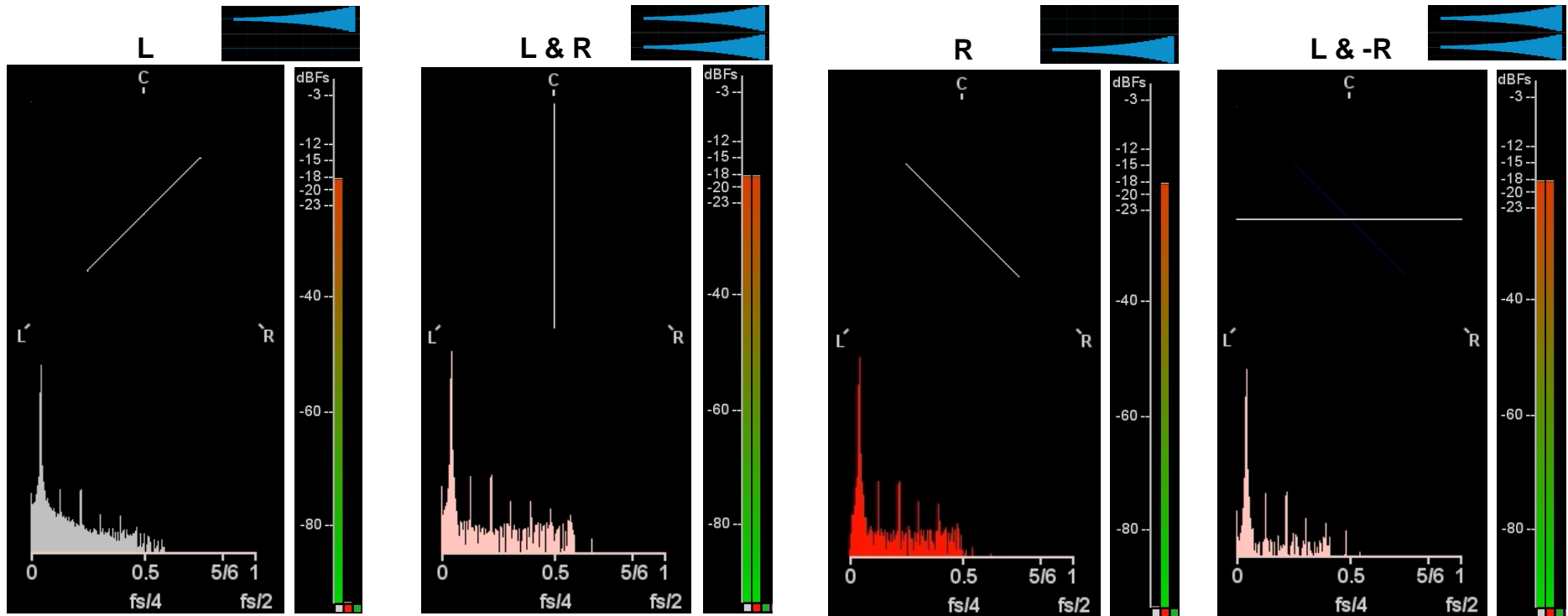


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# Audio Vectorscope Usage Examples

VideoQ Audio Test #2: 1kHz tone, various levels and phases combinations: L, R, L & R (same phase), L & -R (anti-phase)

**Vectorscope** Lissajous figures clearly show relative (L vs R) phases.  
**Level Meter** and **Spectrum** color provides visual hints of active channels.



# Advanced Audio Monitor Usage Example 1

Audio codec test: 5.1 channels, 2 tone frequencies, 2 levels

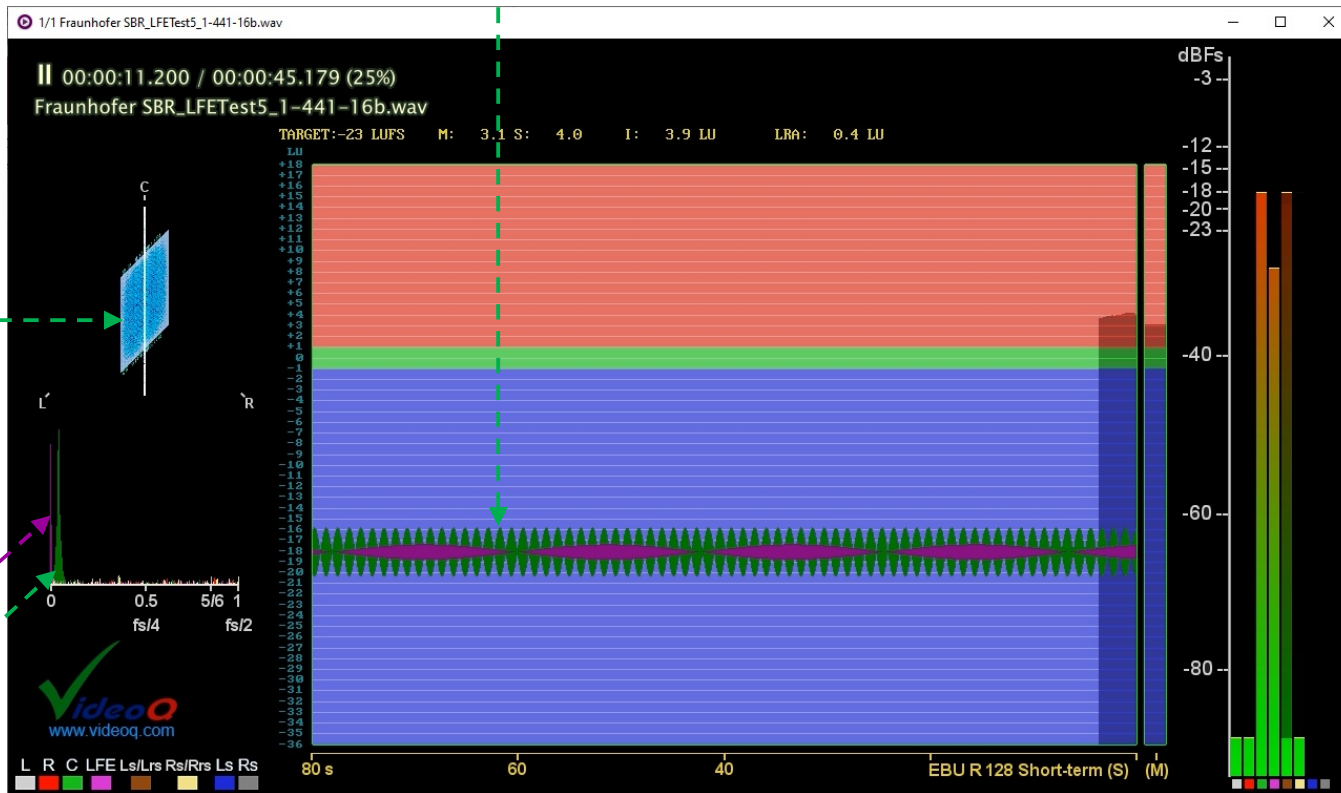
**Frequency Spectrum and Waveform Monitor** both show that the first tone has a lower frequency and level.

## Vectorscope

Lissajous figure shows tone frequencies relationship: 'non-integer ratio'

## Frequency Spectrum

- shows 2 tones:
- 1<sup>st</sup> tone (LFE)
- 2<sup>nd</sup> tone (Center)



# Advanced Audio Monitor Usage Example 2

Professional audio track: 5.1 ATMOS

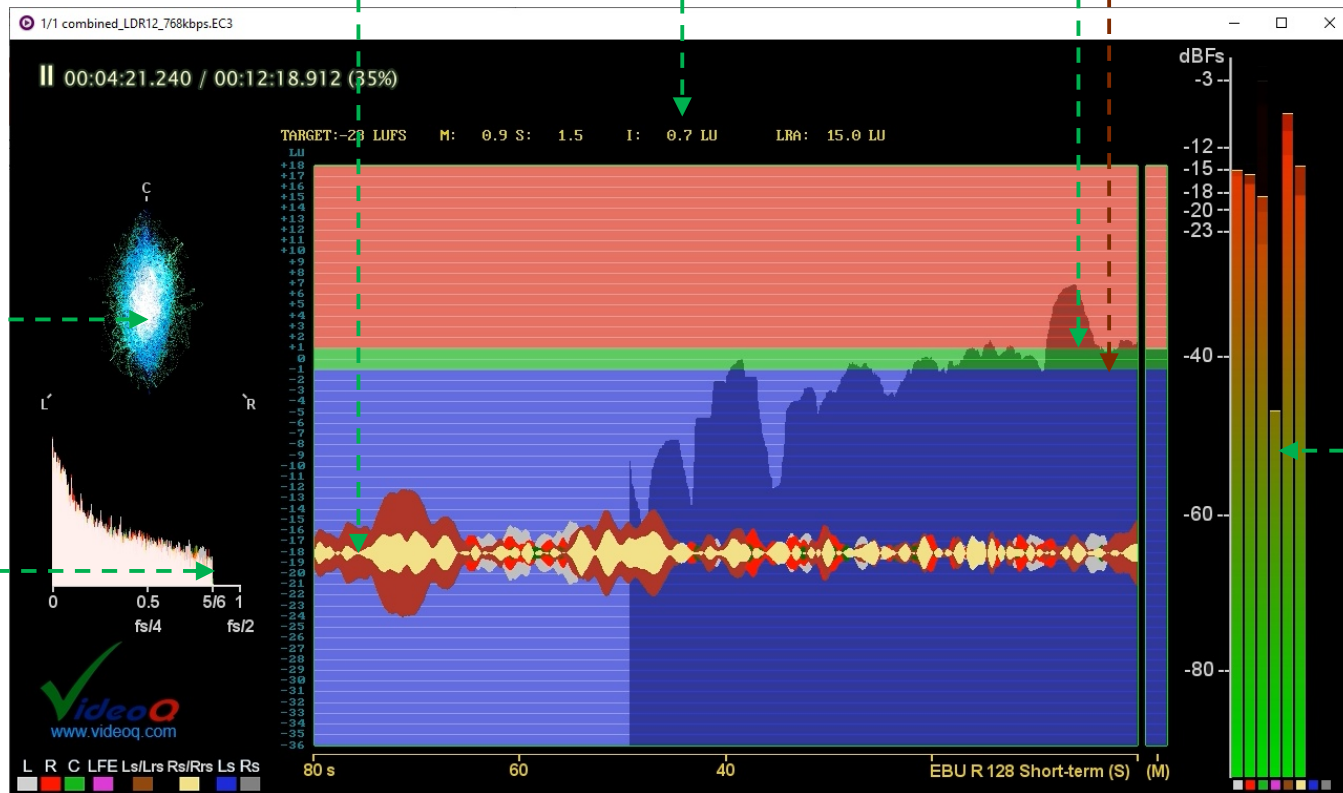
Waveform Monitor shows that all 6 channels are in use (6 different colors)

EBU R 128 Integrated Loudness is within +/- 1 LU limits

Vectorscope shows wide and balanced surround sound image

Frequency Spectrum shows full 20kHz audio bandwidth

Audio file metadata:  
 $fs = 48\text{kHz}$ .  
 $(fs/2) \times 5/6 = 20\text{kHz}$ .



Level Meter shows that all 6 channels are in use.

# Advanced Audio Monitor Usage Example 3

Relatively low quality audio track: dual-mono (not real stereo sound), reduced bandwidth, levels are far too high.

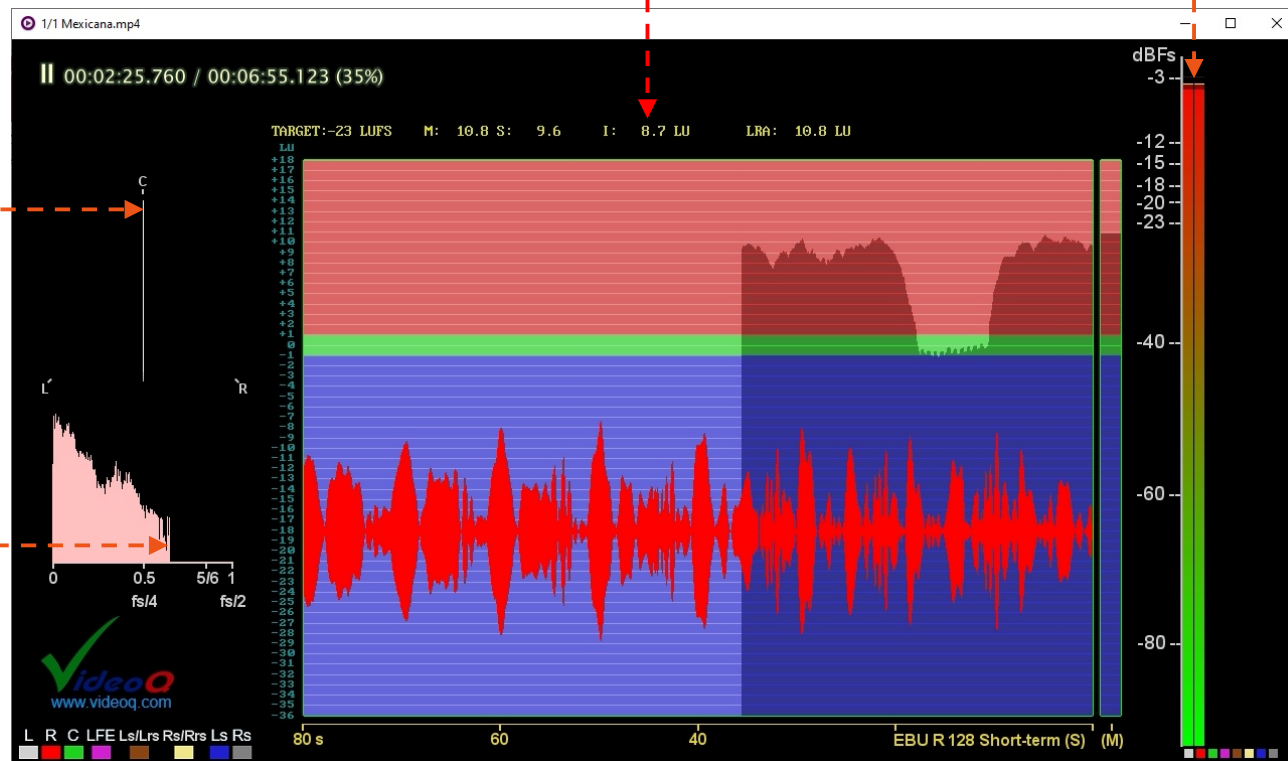
EBU R 128 Integrated Loudness is **much higher** than + 1 LU limit

Level Meter shows dangerously **high peaks**.

**Vectorscope**  
shows **center only**  
sound image  
(not real stereo sound).

**Frequency Spectrum**  
shows **reduced** audio  
bandwidth (~ **15kHz**)  
 $(48/2) \times 5/6 = 20\text{kHz}$ ,  
 $(48/2) \times 0.5 = 12\text{kHz}$

**Spectrum color is pink** because  
L & R channels are **identical**



# About VideoQ

## Company History

- Founded in 2005
- Formed by an Engineering Awards winning team sharing between them decades of global video technology.
- VideoQ is a renown player in calibration and benchmarking of Video Processors, Transcoders and Displays, providing tools and technologies instantly revealing artifacts, problems and deficiencies, thus raising the bar in productivity and video quality experience.
- VideoQ products and services cover all aspects of video processing and quality assurance - from visual picture quality estimation and quality control to fully automated processing, utilizing advanced VideoQ algorithms and robotic video quality analyzers, including latest UHD and HDR developments.



## Operations

- Headquarters in CA, USA
- Software developers in USA and worldwide
- Distributors and partners in several countries
- Sales & support offices in USA, UK