

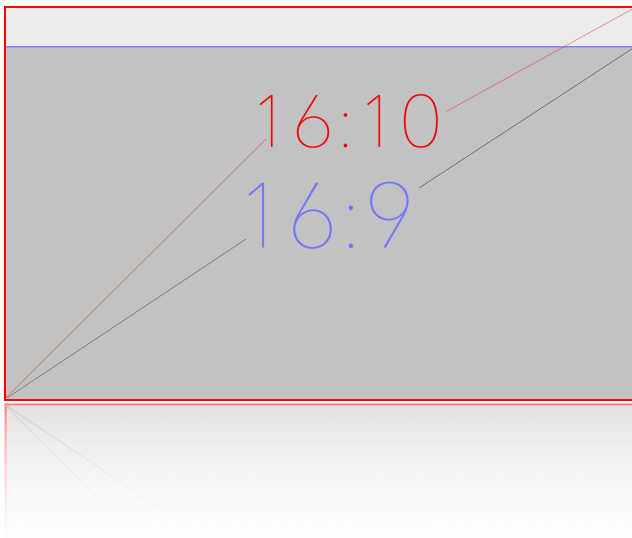
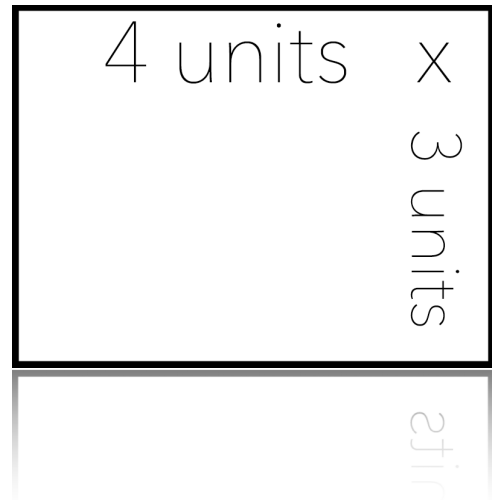
Video URE Book 2

Resolution and Aspect Ratios

Resolution and Aspect Ratios are some of the most fundamental things to consider when working with video. These two pieces of information will either make your system work together well or leave you with horrible letter boxing or stretching. For this reason we will go over what these mean in detail.

Aspect Ratio

The aspect ratio of a piece of video content tells you how wide it is in relation to its height. For example, if I had a piece of content that was 4 units wide by 3 units tall, it would be a 4:3 aspect ratio. 4:3 is one of the oldest aspect ratios as it is what old TV's and CRT Monitors ran at. A 4:3 image looks like this:



There are two other mainstream aspect ratios, which are 16:9 and 16:10. 16:9 is what most TV's run at while 16:10 was invented for computer monitors to allow an extra bit of space at the bottom of the screen for the task bar or dock. when we compare them together they look like the image on the left.

You can see that the 16:10 image is slightly taller than the 16:9 image

If we are talking about multi projector blends and now linear surfaces, these aspect ratios become a bit blurred and we will look at that later.

Which aspect ratio you decide to use depends on the situation you find yourself in, the equipment you have available and what space you need to fill with video.

The most important thing to remember is to **keep it consistent**. The Worst thing you can do is have a projector outputting 16:9 and having to squish you 16:10 content into it or stretch your 4:3 content to it.

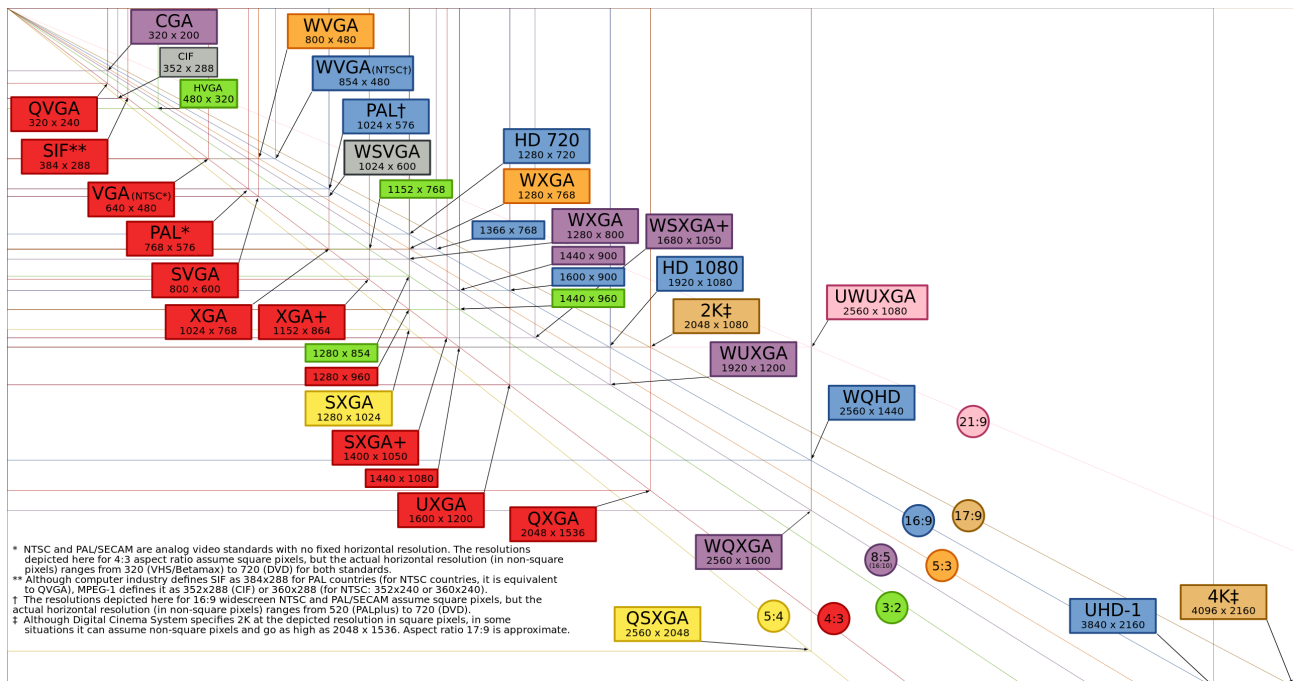
Therefore it is important to know your aspect ratio and **stick to it!**

Resolution

The other cornerstone of the video world is resolution. The resolution of our content affects everything about it. How good it looks, how large it can be scaled, it's file size, it's usability. All of these things need to be considered when working with video.

The resolution of a video is the number and distribution of pixels in each frame, a standard colour video in the UK will run at roughly 30 Frames Per Second (*please see side note on frame rates*).

A video resolution is written as Pixels Across x Pixels Down. So, the 1080P resolution is written as 1920 x 1080, meaning 1920 pixels across and 1080 pixels down. This means each frame has 1920x1080 = 2,073,600 pixels in it. Some common resolutions are listed below for reference:



(Above image used under the creative commons license. Uploaded to wikipedia by user Jedi787plus. License details can be found at https://en.wikipedia.org/wiki/File:Vector_Video_Standards4.svg)

In general you should always try and make your content to the highest resolution you can. This means if you do need to chop and change at the last minute, you don't end up with pixelation. However with high resolution comes a high cost. The more pixels you store per frame the bigger the file is and the more work your playback device has to do to play it.

This is where you have to make the decision about compromise and understand where certain limiting factors come in. For example, if you have a projector that can only output 1280 x 1024 pixels, what is the point of having 5k content? You may need the 5k if you intend to do lots of live scaling up and zooming in but most of the time you would just be putting unnecessary strain on you playback device, whatever it may be. It's very easy to think of a media server as a super

magical machine that solves all the worlds problems, but even the best PC will struggle to play 8 full HD videos at the same time while applying live effects and warping your screen and on and on.

If you can, keep the resolution low.

A Side Note on Frame Rates

The Frame rate is how many frames are played back of a video in a particular second. In the UK the standard frame rate for colour TV is 25 frames per second, meaning every single second 25 separate images are played back.

The human can only detect the changes at less than 24 FPS, so 25 is fine as a start. However if we were to make any content and slow it down live, we would start to see jumpiness as our content will only look smooth played back at 25 FPS.

Another very very important point to consider, is if your are going to use timecode to run your video. If you want your video to run in sync, the time code needs to run at 25 FPS. Otherwise, your video will play back faster or slower than you anticipated, and out of sync with everything else.

WATCH YOUR FRAME RATES!