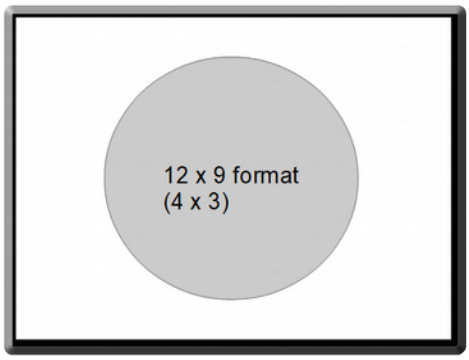
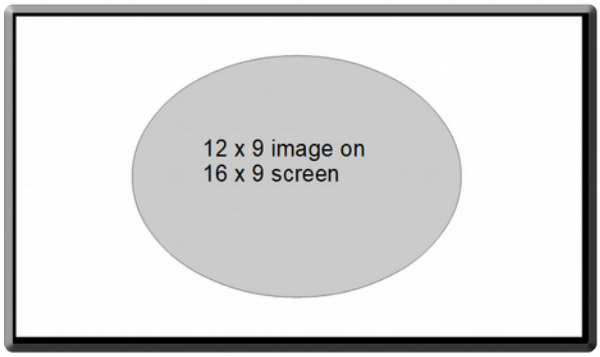
Video Fundamentals 16 Aspect Ratio re-visited Brian Summers G8GQS

I was recently asked about “aspect ratio” so I thought it worthwhile to revisit that subject which was previously covered in video fundamentals number 6.

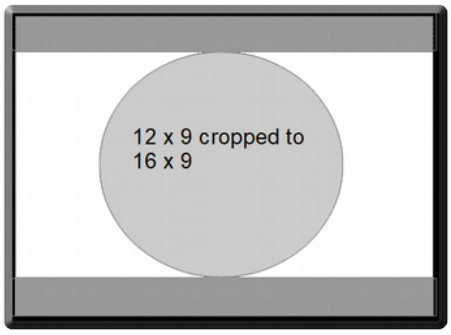
The heart of the problem is ensuring that your display device, monitor or whatever is the same shape as the camera sensor. Easy! So...



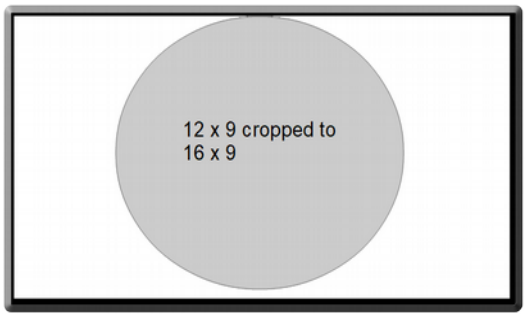


The camera output is 12:9* and the stretched view on a widescreen monitor, or “short fat people” as it is sometimes described. There are a number of solutions to this, some easier than others! *I have called 4:3, 12:9 for ease of comparison here.

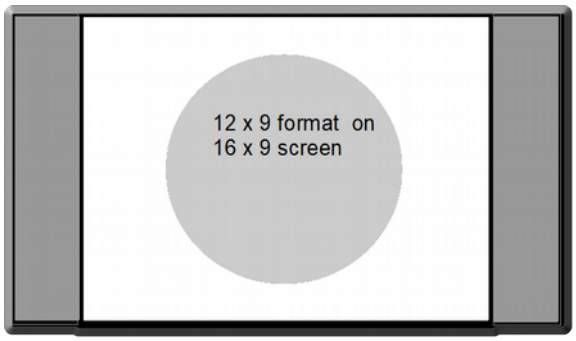
- If you have an old camera it may be possible to reduce the scan hight so the scanned patch is 16:9.
- Use an anamorphic lens, to pre distort the image, difficult to find the right lens and probably cheaper to by a new camera.
- Correct it electronically by discarding or not using parts of the picture/screen.



Here the top and bottom of the picture has been discarded, leaving a 16:9 patch. To achieve this the signal goes through an “aspect ratio converter”.



The top and bottom are really gone and the new picture fills the full screen of the widescreen monitor/TV. The drawback of this solution is you loose the heads/feet of the subject and there is a loss of vertical resolution.



In this solution the 12:9 picture is inserted whole into the 16:9 screen. You do not loose any picture information but the side bars are annoying and there is some loss of horizontal resolution. There are intermediate versions of these two methods, partial crop/partial side bars. You often see an extreme version of this technique with cellphone footage on news reports.

During the transition period from 12:9 to 16:9 there were any number of options but the key item was the aspect ratio converter box. As the world have moved on there is little call for these now, apart from the need to replay old 12:9 footage. The result of this is these complex boxes are redundant and can be bought cheaply, hours of fun but hard to mend! It quite likely that you can do this sort of conversion in a suitable computer.

Most recent TVs are capable of switching display sizes, analog TVs had a 14 bit data word in line 23 and digital TVs have an “Active Format Description” (AFD) in the MPEG data stream. Typically they can change the size and shape of the displayed picture, so that the image shown has the correct ratio, 12:9, 14:9, 16:9, overscan, and a couple of “shoot and protect modes”. If you can get an AFD into your 12:9 cameras output a receiving TV should switch to Pillar Box display and circles will still be round. Search Wikipedia for more information.