SOURCE: http://theautomaticfilmmaker.com/blog/2009/2/23/about-frame-rates-or-why-2997.html

About Frame Rates or Why 29.97?

I recently remembered this popular post from my old blog. Since that blog no longer exists, I thought I would repost it here.

Source: Wikimedia Commons

It is fairly common knowledge that the video on your TV is playing at 30 frames per second (fps) — unless you live in europe where it is 25fps. However, have you ever thought about why these are the frame rates? Why not 50 or 100? You probably haven't, but since I think about moving pictures all day I actually know the answer to this.

The main thing I would like to point out, which some of the geekier of you might already know, is that 30fps is just an approximation of the actual frame rate of video in the US. The real framerate is 29.97fps. Why this incredibly strange number you say? Well, i'll tell you.

In order to make video play back at a fixed rate there needs to be some kind of timing circuit. When television was first beginning, there weren't any of the high tech silcon-based chips that we used for this task today. So the brilliant engineers back then used the oscillation of AC electricty as the basis for their timing circuit. In the US, electricity cycles at 60 times per second (60hz.) So using half of that gives us the frame rate of 30fps. (In Europe, electricity flows at 50hz. 50/2 = 25fps)

So the frame rate of television was actually exactly 30 frames per second at one point in time. However that all changed when color television was introduced. When a signal for color information was added to the television transmission there was a big problem. The color carrier signal was phasing with with the sound carrier signal because they were very close in the spectrum. This made the picture look un-watchable. The quick fix they came up with was to reduce the framerate by .03fps which moved the two signals out of phase.

We have been stuck with this frame rate ever since.

So I hope you found that educational. If you really want to read about this on a more technical level read the link at the bottom of this story. I checked here to refresh my memory on some of the details.

Technical Description: http://artistoftheyear.broadcastengineering.com/ar/broadcasting_format_conversion/

Also more info on the Wikipedia Page