

# NTSC Broadcast Specifications and Standard-Definition TV

This document provides some basic information on NTSC. For more detailed information, we suggest doing Internet searches on NTSC—where there are many articles and pages that go into considerable detail on the subject. Also, the Adobe website has some excellent articles and tutorials that cover digital video production, NTSC, and related subjects. You can access the Adobe website directly from our Links page.

It's important to point out that, especially if you are new to the technical aspects of broadcast media, the NTSC specification can be a very confusing topic!

## Evolving Broadcast Standards (Analog Television)

NTSC is an acronym that stands for ... National Television Standards Committee. This “Committee” was formed to establish critical engineering, technical, and other standards related to the broadcast television industry. Basically, it is a well-defined and complex set of technical and operational standards that is simply referred to as “NTSC”. As with many engineering standards, it has been “updated” as the broadcast market and demand for higher quality grew.

NTSC has been (and continues to be) an evolving standard originally rooted in complex analog principles that pre-dated and then defined the television era as we know it today. It is the broadcast standard for all of North America (including the USA, Canada, Mexico, and Central America), parts of South America, Taiwan, and Japan.

**About the PAL format:** The other predominant standard, known as the ‘PAL’ format, is, in many ways, similar to NTSC, and is widely adapted in Europe, much of Asia, and Australia. Of note is that video and DVD players sold in Europe are readily available that will play both PAL and NTSC formats. PAL format is interlaced at 25 fps.

**About the SECAM format:** The third and least used analog-based television “standard” is the SECAM format. This format was developed by France and is used there, as well as in a few other countries. A complete list of who uses what format can easily be found on the Internet. Television equipment currently sold in countries using SECAM usually support both SECAM and PAL. There are also consumer units available that support all formats—NTSC, PAL, and SECAM. SECAM format uses the same interlaced frame rate as PAL.

## NTSC Standard Definition (SD) Digital Video: Some Things to Know

- Resolution = 720w x 480h (considered high resolution as compared to earlier television standards)
- Frames Per Second (FPS) = 29.97 (interlaced)
- Pixel Aspect Ratio = 0.9:1 defines a non-square pixel with a width of .9, as compared to its height
- Screen Aspect Ratio = 4:3 achieved through the combination of non-square pixels and resolution (720 x 480)
- Widescreen NTSC is still a resolution of 720 x 480. The screen aspect is a “letterboxed” 16:9 ratio. There are always blank spaces at the top and bottom of a widescreen NTSC image frame.

**More on Interlaced FPS:** Interlacing is an important aspect of standard definition digital video that is made for broadcast media and NTSC-compliant. Basically, interlacing is a technique for eliminating flicker that was engineered and implemented in the early days of television. It works something like this: A full screen (your “std-def” TV) is broken into horizontal lines or “fields” (there are 525 scan lines, with 486 being visible) that are then further divided into 2 exactly similar parts configured to be odd and even frames. Each of these frames is displayed 30 times per second (actually 29.97) resulting in a total of 60 frames per second (actually 59.94). Hence, the spec. of 29.97 fps, interlaced, means the TV screen displays 29.97 odd frames and 29.97 even frames every second.

**More on Pixel Aspect Ratio:** Square pixels have a ratio of 1:1, the current NTSC standard for professional video is known as D1. It is this standard that defines the DV resolution of 720w x 480h and the non-square pixel aspect ratio as compliant with broadcast requirements. Basically, the non-square pixel provides the compensation factor needed to maintain true 4:3 screen aspect when DV is used for television.

**Summary:** All of our NTSC clips are created according to the specifications as defined for DV by NTSC. All clips are benchmarked with the JVC-H1375SU NTSC/PAL monitor. Our widescreen SD clips are created from source 1080i and work beautifully in NTSC or PAL NLE environments. NLE applications such as Adobe Premiere Pro and Apple Final Cut Pro have these broadcast standards built-in to their workflow templates, making it easy to create NTSC (or PAL) compliant content once a project is setup for that.