

## La haute définition, les formats, les nouvelles technologies de l'image...

Les progrès réalisés en matière de compression vidéo et audio de techniques de diffusion permettent la diffusion de chaînes de télévision en haute définition mais aussi de l'équipement et de supports [audiovisuel](#).

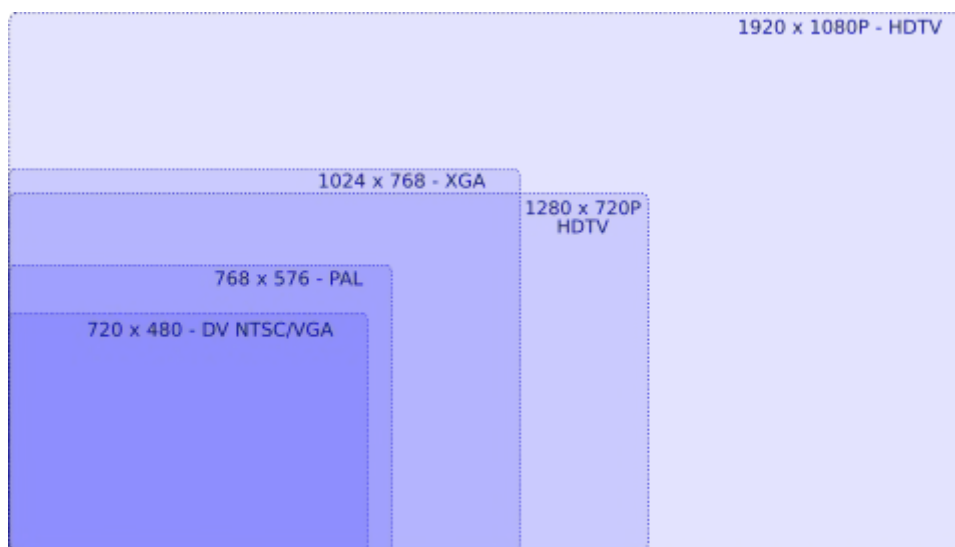
La limitation pour le grand public provient surtout du coût des écrans LCD possédant une définition de 768 lignes. Les écrans commercialisés portant le label [HD Ready](#) offrent obligatoirement une définition minimale de 720 lignes soit deux fois plus de pixels que la télévision standard. Les écrans [Full HD \(1080p\)](#) affichent une définition de 1080 lignes (soit 1920x1080 pixels en format 16/9) soit 5 fois plus de pixels que la télévision standard.

Les technologies d'affichage Full HD actuelles sont : CRT (tubes cathodiques) - Tri LCD - DMD - Plasma - SED/FED (technologie se rapprochant du CRT) - OLED - SXRD (Sony) - D-ILA (JVC).

1080 lignes est le nombre réel utilisable de lignes pour afficher une image vidéo, ou TV. En fait, il s'agit du standard 1125 lignes adapté à la transmission numérique. Il a existé 2 autres standards: s'ils étaient parfaitement au point, leur transmission et les équipements de réception se sont avérés trop complexes et coûteux (diffusion purement analogique):

- Le standard HD-MAC, utilisant 1250 lignes, avec compatibilité D2-MAC.
- Le standard à 819 lignes, inventé par Henri de France et qui était prévu pour être utilisé avec le SECAM au début des années 1950; malgré d'excellents résultats lors de transmissions expérimentales, la première chaîne de TV Française, utilisant pourtant ce standard, n'a jamais reçu la couleur. Il a fallu attendre l'arrivée du standard à 625 lignes. Cependant, la qualité d'une image analogique SECAM est très mauvaise lorsque qu'elle est affichée sur un téléviseur à écran plat (fourmillements, couleurs fades voire fausses et "bavantes").

### Les différents formats haute définition



On s'oriente en Europe aujourd'hui vers deux normes labélisées [HD Ready](#) : 1080 lignes de 1920 points entrelacé ([1080i](#)) et 720 lignes de 1280 points ([720p](#)), le nombre de [pixels](#) est doublé par rapport au SDTV. le [Full HD](#) correspondant à 1080 lignes de 1920 points en progressif.

Les principaux formats d'image utilisables sont les suivants :

[720p](#) : 1280 X 720 à 50 et 60 Hz en [progressif](#)

[1080i](#) : 1920 X 1080 à 50 et 60 Hz en [entrelacé](#)

[1080p](#) : 1920 X 1080 en [progressif](#)

(Source : [www.wikipédia.org](http://www.wikipédia.org))



## Inaugural Digital HDTV Public broadcast

HDTV technology was introduced in the United States in the 1990s by the [Digital HDTV Grand Alliance](#), a group of television companies and [MIT](#).<sup>[6][7]</sup> On April 6, 1997, CBS went on the air with WCBS-HD from the top of the Empire State Building, New York, doing demos and evaluations.<sup>[8]</sup> The American [Advanced Television Systems Committee](#) (ATSC) HDTV system had its public launch on October 29, 1998, during the live coverage of astronaut [John Glenn](#)'s return mission to space on board the [Space Shuttle](#) "Discovery".<sup>[9]</sup> The signal was transmitted coast-to-coast, and was seen by the public in science centers, and other public theaters specially equipped to receive and display the broadcast.<sup>[9]</sup> The broadcast was made possible by the [Harris Corporation](#), which sponsored the equipment necessary for transmitting and receiving the broadcast.<sup>[9][10]</sup>

## First Regular European HDTV broadcasts

Although HDTV broadcasts had been demonstrated in Europe since the early 1990s, the first regular broadcasts started on January 1, 2004 when [Euro1080](#) launched the HD1 channel with the traditional New Year concert from Vienna. Test transmissions had been active since the IBC exhibition in September 2003, but the New Year's Day broadcast marked the official start of the HD1 channel, and the start of HDTV in Europe.<sup>[11]</sup>

Euro1080, a division of the Belgian TV services company Alfacam, broadcast HDTV channels to break the pan-European stalemate of "no HD broadcasts mean no HD TVs bought means no HD broadcasts..." and kick-start HDTV interest in Europe.<sup>[12]</sup>

The HD1 channel was initially free-to-air and mainly comprised sporting, dramatic, musical and other cultural events broadcast with a multi-lingual soundtrack on a rolling schedule of 4 or 5 hours per day.

These first European HDTV broadcasts used the 1080i format with MPEG-2 compression on a DVB-S signal from [SES Astra](#)'s 1H satellite at Europe's main DTH [Astra 19.2°E](#) position. Euro1080 transmissions later changed to MPEG-4/AVC compression on a DVB-S2 signal in line with subsequent broadcast channels in Europe.

## HDTV sources

The rise in popularity of large screens and projectors has made the limitations of conventional Standard Definition TV (SDTV) increasingly evident. An HDTV compatible television set will not improve the quality of SDTV channels. It will make it even worse because of scaling artifacts. To display a superior picture, high definition televisions require a High Definition (HD) signal. Typical sources of HD signals are as follows:

- Over the air with an antenna. Most cities in the US with major network affiliates broadcast over the air in HD. To receive this signal a HD tuner is required. Most newer high definition televisions have a HD tuner built in. For HDTV televisions without a built in HD tuner, a separate set-top HD tuner box can be rented from a cable or satellite company or purchased.
- Cable television companies often offer HDTV broadcasts as part of their digital broadcast service. This is usually done with a set-top box or [CableCARD](#) issued by the cable company. Alternatively one can usually get the network HDTV channels for free with basic cable by using a [QAM tuner](#) built into their HDTV or set-top box. Some cable carriers also offer HDTV [on-demand](#) playback of movies and commonly viewed shows.
- Satellite-based TV companies, such as [DirecTV](#) and [Dish Network](#) (both in North America), [Premiere](#) (in Germany), [Sky Digital](#) and [freesat](#) (in the UK and Ireland), [Bell TV](#) and [Star Choice](#) (both in Canada), [Canal Digitaal](#) (in the Netherlands), [NTV Plus](#) (in Russia) and [Digit-Alb](#) (in Albania), offer HDTV to customers as an upgrade. New satellite receiver boxes are usually required to receive HD content.

- Video game systems, such as the [PlayStation 3](#) and [Xbox 360](#), and digital set-top boxes that rely on an Internet connection, such as the [Apple TV](#), can output an HD signal. The [Xbox Live Marketplace](#), iTunes Music Store, and [PlayStation Network](#) services offer HD movies, TV shows, movie trailers, and clips for download, but generally at lower bitrates than a [Blu-ray Disc](#).
- Most newer computer graphics cards have either [HDMI](#) or [DVI](#) interfaces, which can be used to output images or video to an HDTV.
- Almost all computer graphics cards have standard [SVGA](#) jacks which can be used to output images or video to an HDTV's "PC Input" jack.
- The optical disc standard [Blu-ray Disc](#) (25GB-50GB) can provide enough digital storage to store up to 10 hours of HD video content, depending on encoder settings.<sup>[13]</sup>
- A [DVD-R](#) disc (~4.7GB-9GB) can also provide storage for up to 3 hours of HD video content, readable by a Blu-ray player, PlayStation 3 video game console or Blu-ray drives installed on PC towers, depending on encoder settings.<sup>[14]</sup>

## Notation

HDTV broadcast systems are identified with three major parameters:

- **Frame size** in pixels is defined as *number of horizontal pixels x number of vertical pixels*, for example *1280 x 720* or *1920 x 1080*. Often the number of horizontal pixels is implied from context and is omitted.
- **Scanning system** is identified with the letter *p* for [progressive scanning](#) or *i* for [interlaced scanning](#).
- **Frame rate** is identified as number of video frames per second. For interlaced systems an alternative form of specifying number of fields per second is often used. Recently the uniform notation of specifying number of frames per second both for progressive and interlaced video became increasingly popular.<sup>[15]</sup>

If all three parameters are used, they are specified in form *frame size scanning system frame rate*. Often, one parameter can be dropped if its value is implied from context. In this case the remaining numeric parameter is specified first, followed by the scanning system.

For example, *1920x1080p25* identifies progressive scanning format with 25 frames per second, each frame being 1920 [pixels](#) wide and 1080 pixels high. The *1080i25* or *1080i50* notation identifies interlaced scanning format with 50 fields(25 frames) per second, each frame being 1920 pixels wide and 1080 pixels high. The *1080i30* or *1080i60* notation identifies interlaced scanning format with 60 fields (30 frames) per second, each frame being 1920 pixels wide and 1080 pixels high. The *720p60* notation identifies progressive scanning format with 60 frames per second, each frame being 720 pixels high, 1280 pixels horizontally are implied.

While 50Hz systems have only three scanning rates: 25i, 25p and 50p, 60Hz systems operate with much wider set of frame rates: 23.98p, 24p, 29.97i/59.94i, 29.97p, 30p, 59.94p and 60p. In the days of standard definition television, the fractional rates were often rounded up to whole numbers, like 23.98p was often called 24p, or 59.94i was often called 60i. High definition television allows using both fractional and whole rates, therefore strict usage of notation is required. Nevertheless, 29.97i/59.94i is almost universally called 60i, likewise 23.98p is called 24p.

For commercial naming of a product, the frame rate is often dropped and is implied from context, e.g. a "1080i television set". A frame rate can also be specified without a resolution. For example 24p means 24 progressive scan frames per second, and 50i means 25 interlaced frames per second. Most HDTV systems support resolutions and frame rates defined either in the ATSC table 3, or in EBU specification. The most common are noted below.