A Beginner's Guide To How HDTV Works

Wednesday, 04 February 2009

The next big wave hitting television viewers across the world is HDTV. This acronym stands for High Definition Television. It is becoming the new definition of picture clarity, voice accuracy and viewing pleasure. With as many as twice the number of lines of resolution than in the normal television, the working of a HDTV is truly a work of sheer technological brilliance. The audio quality provided by a HDTV will be through a digitally encrypted 5.1 channel decoder and will be a blessing for music buffs. Combine these characteristics and backing on high end content that TV channels are offering today, the viewers are going to have a gala time.

So what makes HDTV provide more than a normal TV and how does it work? To start with, an HDTV is defining a new standard for picture quality, audio clarity, feature richness, viewing angle and overall pleasure of viewing. Normal TV viewing, like maybe in the NTSC format, gives approximately 550 lines of horizontal resolution, while HDTV gives twice that. This is because of the digital encoding which allows compression of the signal to make it easier to store and transmit. The transmission end of the content for digital television viewing too has to be different and more efficient as compared to today's analog TV.

Analog TV; the one which most viewers are used to today, has a 6 MHz signal that carries intensity and color information for each scan line of the picture. An analog TV signal in the North America has 525 scan lines for the image, and each image is refreshed every 30th of a second (half of the scan lines are painted every 60th of a second in what is called an interlaced display). The horizontal resolution is something like 500 dots for a color set. HDTV provides double that at approx 1024 resolution lines per screen and the refreshing rate remains the same as that of an analog TV, giving it twice the clarity.

The higher resolution picture is the main selling point for HDTV. Imagine 720 or 1080 lines of resolution compared to the 525 lines people are used to in the United States (or the 625 lines in the case of Europe) - it's a huge difference! The various formats available for HDTV are as follows:

* 720p - 1280x720 pixels progressive
* 1080i - 1920x1080 pixels interlaced
* 1080p - 1920x1080 pixels progressive

Interlaced or progressive refers to the scanning system. In an interlaced format, the screen shows every odd line at one scan of the screen, and then follows that up with the even lines in a second scan. Progressive scanning shows the whole picture, every line in one showing, every sixtieth of a second. This provides for a much smoother picture, but uses slightly more bandwidth.

The increase in the compression quality for video and the audio available today is driving the market towards digital television. The bandwidth requirements of the content being transmitted being high, digital compression techniques are better suited and also better employed for transmission of content for digital television viewing. For the HDTV to function and prosper, it is necessary to change both the transmission end equipment as well as the reception end television - the HD television.

One thing is for sure - the days of good television viewing are coming.