

Technology Today

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HDTV

HIGH Definition Television (HDTV) provides eye-popping digital images with ear-splitting digital sound. HDTV is the first major visible television change since the first broadcast of color TV in 1953. We are at the beginning of the HDTV technology wave that will eventually change the way we view television. For the time being, however, those who embrace this new technology have to accept limited HDTV broadcasting, and will have to install a 1950s-style TV antenna—at least until HD-cable and HD-satellite transmissions become available.

The ramifications of compatibility can best be understood when you learn that HDTV is not compatible with our current analog television system. Couch potatoes who purchase an HDTV set need not fear loss of current TV programming, because those units have the necessary electronics to also receive analog broadcasts. Due to this lack of compatibility, both analog and digital broadcasts will continue to be transmitted until the year 2006. When analog transmissions stop, special TV boxes will exist to convert digital signals to analog so nondigital sets may still be used.

At first glance you might think that an HDTV is a regular television set with a wide postage stamp shape (16:9 aspect ratio). Actually, HDTV sets are also made in the conventional 4:3 aspect ratio. The significant difference

between analog and digital isn't the shape of the picture tube, but rather how the picture is sent from the broadcaster to your television set. DTV and HDTV both accept the same type of signal; however, DTV *downconverts* the higher resolution HDTV digital signals to a 480 resolution line format.

An HDTV broadcast can contain 1,080 lines of interlaced resolution (called 1080i) which is the adopted standard of NBC and CBS, or it can contain 720 lines of progressively scanned resolution (720p), which is the adopted standard of ABC. The 720p is also

created by a studio upconverting an analog broadcast for HDTV viewers. The digital signal decoder on an IIDTV set provides the highest quality image that any digital or analog signal allows. It is important to note that the 1080i and 720p are just two of the 18 acceptable formats included in the Digital TV standard developed by the FCC's Advanced Television Standards Committee.

Let's look at how analog and digital *upconverted* programs are transmitted. In both cases, we will start with an analog video camera that produces a variable-strength electric signal as it scans the

scene in front of it. In an analog system, a bright spot in front of the camera becomes a strong signal; a dark spot becomes a weak signal. These signals are then joined to a radio carrier wave and transmitted to your television receiver.

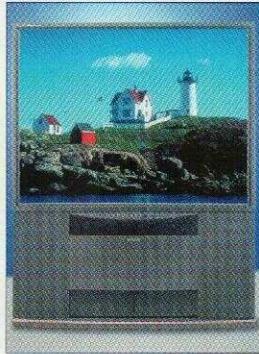
The entire transmission process of the analog system keeps the analog energy wave, which is constantly changing in strength, from getting distorted. Distortions that occur show up as snow and other imperfections in your television picture. When the signal is received by your television, its varying strength determines how bright the areas of your picture tube glow.

For the upconverted digital broadcast, the camera's analog image is converted into compressed digital code. The stream of digital code is now joined with a carrier wave and transmitted to your television receiver. This digital stream is made up of 1s

and 0s that the computer in your HDTV converts into motion pictures.

The main difference between the two systems is the conversion to a digital signal and its compression, so it can be transmitted to your home at 19.39 million bits per second. As soon as HD-Cable and HD-Satellite standards are approved, your cable and satellite companies will start to sell IIDTV service. Your cable company will receive the digital broadcast signal from the air and send it on to you as digital code through their cable wires. If you have a DBS (Direct Broadcast Satellite) system such as PrimeStar or RCA's DSS (Digital Satellite System), your broadcast will be transmitted through the air to your special dish antenna from a satellite in a geosynchronous orbit.

Today, HDTV is capable of giving you picture-postcard quality from a 1080i studio digital transmission or DVD player.



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The sets can give you ghost-free movie theater pictures from upconverted analog programming. A web TV unit could allow you to super size your web surfing, arcade gaming, and other computer activities.

HDTV reception is expected to be available to 60 percent of the American viewing public by Christmas. With each passing month, more broadcasts will be transmitted in the 1080i format or upconverted to 720p. HDTV will become a consumer-friendly product when its price tag matches the middle-class wallet.

Recalling the Facts

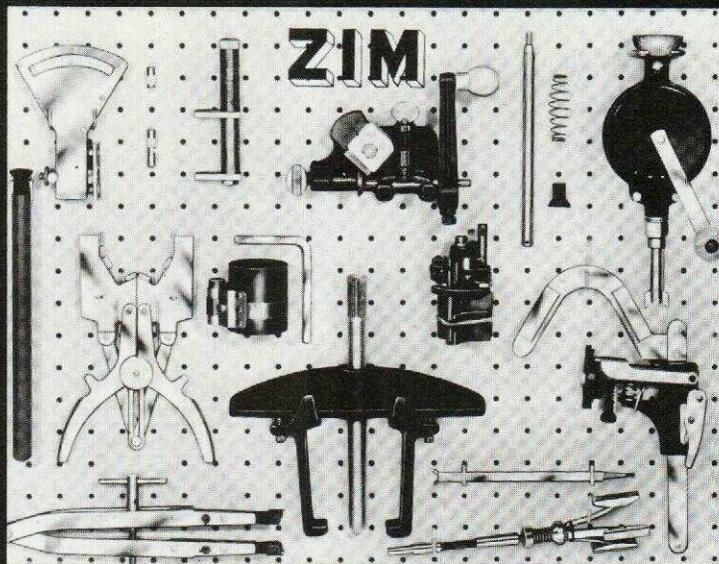
1. How will current broadcasting standards change in 2006?
2. When a television station upconverts a TV program, what are they doing?
3. What is the main advantage of HDTV over our current analog system? *tut*

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