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Easy Dvr Recording With Analog, Digital, or Satellite Television

Television and video are terms that are sometimes used interchangeably, but differ in their technical meaning. Video is the visual portion of television, whereas television is the combination of video and audio modulated onto a carrier frequency (i.e., a television channel), so that the signal can be delivered to the receiver (TV or computer/PVR with a TV tuner). The DVR resolutions differ from the way in which a video is recorded.

Analog television

Analog television in NTSC, PAL or SECAM formats, analog cable, or regular VHS tapes use a signal that is fed directly to the electron beam within the television set. There are a number of details on how this is done, but in essence each line in each frame corresponds to a specific fraction of time within the signal.

To record an analog signal a few steps are required. A TV tuner card tunes into a particular frequency and then functions as a frame grabber, breaking the lines into individual pixels and quantizing them into a format that a computer can comprehend. Then the series of frames along with the audio (also sampled and quantized) are compressed into a manageable format, like MPEG-2, or WMF, usually in software. Some TV tuner cards like the DVR-250/350 or the TiVo chip deliver an MPEG-2 or other compressed stream directly to the computer, performing both the frame grabbing and compression in hardware. This greatly reduces the load on the CPU allowing an overall cheaper implementation.

Digital television

Digital television contains audio/visual signals that are broadcast over the air in a digital rather than analog format. Recording digital TV is generally a straightforward capture of the binary MPEG-2 data being received. No expensive hardware is required to quantize and compress the signal (as the television broadcaster has already done this in the studio). The MythTV DVR supports both international DVB signals and American ATSC signals while the TiVo Series 3 supports only the ATSC signals. In the U.S., the FCC attempted to place a road-block before digital DVRs with its "Broadcast flag" regulation. Digital video recorders which had not won prior approval from the FCC for implementing "effective" digital rights management would have been banned from interstate commerce as of July 2005. The regulation was struck down on May 6, 2005.

DVD-based PVRs available on the market as of 2006 are not capable of capturing the full range of the visual signal available with high definition television (HDTV). This is largely because HDTV standards were finalized at a later time than the standards for DVDs. However, DVD-based PVRs can still be used (albeit at reduced visual quality) with HDTV since currently available HDTV sets also have standard A/V connections.

Satellite or digital cable

Recording satellite or digital cable signals on a digital video recorder is more complex than recording analog signals or broadcast digital signals. This is so because the MPEG-2 or MPEG-4 stream is usually encrypted to prevent people from viewing the content without paying for it (usually via subscription).

The satellite or cable set-top box does two things. First, it decrypts the signal. Second, it decodes the MPEG stream into an analog, DVI, or HDMI signal for viewing on the television. In order to record cable/satellite digital signals you must get the signal after it is decrypted, but before it is decoded (between steps one and two); this is how DVRs built into set-top boxes work.

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