BUILD IT

HD on a PC

Experiencing high-definition television programming on your computer isn’t as expensive or difficult as you might think. Learn how we turned a PC into an HDTV in under an hour.

BY DAVE ZATZ WITH KEVIN C. TOFEL

Illustration by Tomer Hanuka
HD Is in the Air

WE'RE IN THE MIDDLE OF A TELEVISION transition. Yeah, you might have noticed.

The FCC has mandated that all over-the-air analog NTSC television programming (that's the ordinary stuff you watch today) be replaced with digital ATSC transmissions by February 17, 2009. ATSC defines a 16:9 widescreen format, digital surround sound, and high-definition imagery with resolutions up to 1,920-by-1,080. ATSC digital television standards—simply DTV for short—are composed of 18 video formats, including what we think of as high-definition television (HDTV). This means that not all DTV is HDTV, but all HDTV is considered DTV. HDTV video provides a vastly superior picture to standard def, with more content filling the widescreen aspect ratio.

Currently HDTV content is available through cable, via satellite, and over the air. While cable or satellite content requires a paid subscription, over-the-air signals are actually free; and with the right equipment, you can enjoy those free HDTV signals on your personal computer. About time too: Analog TV tuners look terrible on your PC, but ATSC-delivered HDTV looks great—it’s the TV/PC marriage we've all been waiting for.

You’ll be pleasantly surprised to realize that the system requirements for viewing HDTV on your computer are relatively modest. In fact, most computers purchased in the last two years should support high-definition programming with just a few modifications. For starters, most current video cards and displays should display high-def content—a minimum of 720 horizontal pixels provides a high-definition experience. If your monitor and video card support a resolution of at least 1,024-by-768, you can display an HDTV program. Widescreen displays are particularly well suited for the 16:9 format of high-def programs.

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MY PROJECT: REFIT AN OLD PC

THE PLAN Turn a nearly two-year-old Dell with modest specs (2.8-GHz Pentium 4, 125GB of RAM) into an HDTV system with DVR functionality. I started with a FusionHDTV5 tuner card bundled with a Philips antenna. If my goal had been solely live viewing of HDTV, I could have stopped shopping at this point. Instead I chose to add advanced recording features and a polished interface with a copy of Beyond TV. And to maximize recording capacity, I purchased a roomy 300GB Maxtor hard drive. The entire installation and configuration took less than 30 minutes.

CHOOSING A PC There's a good chance you can affordably retrofit your existing PC simply by adding an internal ATSC tuner card or external USB accessory. For good performance, your computer should have an Intel Pentium 4 or AMD equivalent, at least 768MB of memory, a large-capacity hard drive, and a dedicated video card with at least 128MB of onboard memory. Integrated graphics could work, but a dedicated video card increases performance.

COST Repurposed PC—Free. Maxtor DiamondMax 300GB drive—$89.98 direct, from Staples.com

SELECTING A TUNER Always verify the system requirements of the tuner you purchase to ensure you meet the minimum specifications. Recording high-definition content will require between 6GB and 10GB of storage per hour of programming, so a major consideration will be hard drive capacity. And to take advantage of that digitally transmitted 5.1 surround sound, you may also need to invest in an audio card.

COST DVICO FusionHDTV5 RT Lite PCI—$99.99 direct, from SnapStream.com

ADD AN ANTENNA If you're near your local station's broadcast towers, you're very likely to receive a free digital television signal. To find out, and figure out which antenna is best suited for your location, go to AntennaWeb.org.

COST Philips Silver Sensor UHF antenna—Free (included with tuner purchase)

MORE USEFUL SOFTWARE Most prime-time TV is now broadcast in high definition, but daytime television, sports, and news are offered sometimes in SDTV with no apparent rhyme or reason. Regardless of what software powers your card, free online guides like TiVo and TitanTV.com can display local lineups and specifically indicate HD programming. Spring for Beyond TV, though; its guide notes HD shows and its DVR capabilities are awesome.

COST Beyond TV 4.4—$69.99 direct, from SnapStream.com

HDTV FOR OTHER PLATFORMS Windows users aren't the only ones who can enjoy high-definition television programs on their computers. Both Linux and Mac platforms also support HDTV capabilities. Elgato offers EyeTV Hybrid, a $150 USB tuner and software bundle for Apple OS X, while Linux users can utilize many of the same HD tuners available for Windows and power their systems using the free MythTV software.
Pick Out an HDTV Antenna

If you’re near your local station’s broadcast towers, there’s a good chance you can receive a free digital television signal. A large majority of urban and suburban areas are saturated with them. To help you determine if you’re covered and find out which antenna is best suited for your location, the Consumer Electronics Association hosts AntennaWeb.org. When you enter your physical address, this Web site returns the relative distance and direction of your local television affiliates and suggests an appropriate antenna. An inexpensive indoor model may be sufficient for your location while homes far from broadcast towers could require an antenna that’s amplified or roof-mounted.

Real-world conditions don’t always match up to AntennaWeb’s analysis, because of physical interference or signal reflection. Where I live, outside Washington, D.C., the site suggested a small, indoor, multidirectional antenna—often found for less than $40. But high-rise buildings reflect ABC’s digital broadcast in my neighborhood, causing intermittent signal loss even though the tower is nearby. In areas without tall structures, such as suburban Philadelphia, I’ve successfully pulled high-def signals from as far away as 40 miles with the very same unamplified antenna.

1 Connect the cable. A UHF antenna will connect to your tuner card with a standard coaxial cable. It should be included with most antennas.

2 Hook up the antenna. Next, connect the other end of the coax cable to your antenna and find a good home for it.

3 Aim everything. Take some time to position the antenna for best reception. This might require a bit of trial and error.

WHICH ANTENNA IS RIGHT FOR YOU?

AntennaWeb.org color-codes antennas suitable for receiving local stations based on your proximity to broadcast towers. Match codes to box labels to decide which model will work best.

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Consumer Electronics Association
Add an Internal Tuner Card

1 Install the card. First things first: Open the computer case and install the FusionHDTV5 RT Lite card into a free PCI slot. It's a standard-size card that fits into any free PCI slot.

2 Download new drivers. Set aside the included FusionHDTV5 RT Lite software CD, and download the latest drivers from www.fusionhdtvco.kr.

3 Get a signal. Once you've installed the tuner card and drivers, finding an HD signal is pretty simple.

Configure Your Software

Most tuners come bundled with rudimentary software for watching HDTV content. In some cases more advanced recording features are included. While the bundled software is sufficient for basic viewing and some recording, there are more refined applications on the market.

Beyond TV (an Editors' Choice) and SagcTV are two options; expect to spend around $75 for the software. Another HD-capable application worth keeping an eye on is Yahoo! Go TV, which is currently available as a free beta. These packages offer convenient digital video recorder (DVR) features such as integrated programming guides, the ability to schedule recordings, and even pause and rewind capabilities for live HDTV. Additionally, these applications allow for Web-based remote-record scheduling, which comes in handy.

1 Buy your software. SnapStream's Beyond TV is a very popular choice among HDTV enthusiasts. It's relatively inexpensive and offers a wealth of configuration options.

2 Tweak it. Beyond TV offers a Web-based administration interface, letting you configure your HDTV from any browser. Get familiar with the myriad of options.

3 Record at will. The software downloads a complete program guide to your PC and handyly labels the shows that are broadcast in HD. That's all you'll want to watch, right?
Storing and Moving Your Content

You'll definitely need a giant hard drive for HD content, but viewing recorded shows isn't restricted to the computer where you captured the content. By utilizing your existing home network, you can easily transfer high-def recordings to other computers. You might record a football game on your desktop and copy it to your laptop to watch while traveling. But the file size for a 3-hour game can exceed 30GB, taking hours to transfer over a typical network. While a standard wireless or wired network is sufficient to move high-def recordings, utilizing a Gigabit Ethernet infrastructure is significantly faster. Optical media provides another option for moving content: If you're using Windows MCE, and a high-def recording is less than 30 minutes long, you can utilize the "Create DVD" function to burn a copy for playback on other computers.

Beyond TV and SageTV save content in an unprotected MPEG-2 file format. These files can be played from a variety of software applications, such as the free VLC media player or players typically bundled with DVD software.

In addition to copying and moving recordings, you can also stream high-definition content to other devices on your network. One example is using the Xbox 360 as a media extender to "place-shift" Windows MCE content onto an HDTV in your home. Both Beyond TV and SageTV also sell their own media extenders. Each offers a software client for viewing HD recordings on another computer, and Sage offers a hardware extender for television viewing.

1. Set the jumpers. Adding a new IDE drive? Make sure to set the disk's jumper to the "slave" position. This ensures that Windows still boots from your primary disk.

2. Plug and play. Next connect both the data and power cables to a secondary hard drive. Once you screw the drive in place (as shown), your hardware work is through.

3. Change the destination. Attach the antenna with the included coaxial cable and install Beyond TV 4. Have BTV scan for HD channels, and specify that recordings be saved to the second hard drive.

Our Fave HD Channels

With so much to watch, how do you choose? Here are a few of the high-def channels we find particularly cool.

Discovery HD Theater
The Discovery Channel is famous for its innovative programming and expansive nature shows. HD takes it to another level. We are especially fond of American Chopper in HD—you might need sunglasses before you look directly at Paul Jr.'s chromed-out bikes.

PBS HD Channel
Believe it or not, PBS has been in the HD space for a while now, having launched its HD channel back in 2004. The channel provides the same high-quality programming and variety that we have come to expect from PBS, and it's hard to take your eyes off NOVA in HD.

Universal HD Channel
NBC and Universal's HD channel harnesses their vast content collection and puts it all in one place. While Battlestar Galactica is a favorite around here, we especially like the sports replays that you can't get anywhere else, like the 2006 US Open or Notre Dame football.

You Built It!

PC Mag reader Chris Valenzuela took our iPod boom box project to the next level with his own "1 Box." It's giant! What have you built lately? Send your submission to diy@pcmag.com.