

## **The Digital Television Transition**

Testimony of

Joel Kelsey  
Policy Analyst

Before the

Federal Communications Commission

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Chairman Copps, Commissioners Adelstein and McDowell, thank you for the opportunity to testify today. Consumers Union<sup>1</sup> is the non-profit publisher of *Consumer Reports*. In addition to fighting for consumers in Washington, D.C., we also provide unbiased advice and educational materials to assist consumers in making marketplace decisions. All of our educational materials about the digital television transition – including our ratings of selected digital converter boxes; advice on troubleshooting antenna and signal issues; and a tutorial on how to set up your converter box – are available at [www.consumerreports.org/dtv](http://www.consumerreports.org/dtv). You do not need to be a subscriber to access *Consumer Reports* DTV information. I have also attached our DTV Made Easy guide, which we published in partnership with the FCC, to this testimony.

Six months ago Consumers Union wrote Congress with grave concerns about the nation's preparedness for the transition to digital television. We were concerned that millions of consumers were stranded on a waiting list for converter box coupons from the Commerce Department; millions more were still unprepared for the switch; and many more remained confused about how to navigate the transition. We feared over seven million largely rural, low-income and elderly households that rely on free over-the-air broadcasts for news and information were about to be left behind by the very government that mandated the DTV transition.

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<sup>1</sup> Consumers Union is a nonprofit membership organization chartered in 1936 under the laws of the State of New York to provide consumers with information, education and counsel about goods, services, health, and personal finance. Consumers Union's income is solely derived from the sale of *Consumer Reports*, its other publications and from noncommercial contributions, grants and fees. In addition to reports on Consumers Union's own product testing, *Consumer Reports* regularly carries articles on health, product safety, marketplace economics and legislative, judicial and regulatory actions that affect consumer welfare. Consumers Union's publications carry no advertising and receive no commercial support.

However, this potential debacle was averted. Congress listened and responded by passing the *DTV Delay Act of 2009* (P.L. 111-4), postponing the transition from February 17<sup>th</sup> to June 12<sup>th</sup>. Under the new leadership of Acting Chairman Copps, and with just over three months to pick up the pieces of a disorganized education campaign, the FCC has responded quickly and effectively. We applaud Chairman Copps for working closely with Commissioners McDowell and Adelstein to focus and coordinate the agency's management of the DTV transition. In our view three critical actions created this pivot moment at the agency:

- (1) *Better hotlines* - Working with industry partners, the FCC consolidated various DTV hotline efforts into one central number, with well trained agents, allowing consumers to get all of their questions answered by dialing one number, rather than a half dozen.
- (2) *More hands-on assistance* - Based on successes in the media markets that transitioned early, the FCC has worked with community centers in a comprehensive way to create DTV Assistance Walk-in Centers, to provide on-site help to consumers having trouble navigating the transition.
- (3) *Better information about signal coverage* – In addition to exploring ways to expand the coverage of digital signals, like digital transmission service (DTS) and fill-in translators, the FCC has developed effective consumer-facing materials to help those experiencing signal issues. Of particular note, is the new web function which shows a consumer the anticipated strength of the full-power digital signals at their address; providing needed guidance on whether to purchase a new antenna.

Credit must also be given to the National Telecommunications and Information Administration. Within one month of the *DTV Delay Act*, the NTIA was able to make modest adjustments to the coupon program ensuring expedited delivery to consumers – some of whom were waiting up to six weeks for their coupons – and allowing millions of early adopters with expired coupons to reapply. With new funding the NTIA was able to address the growing appetite for converter box coupons and eliminate the coupon waiting list, which had grown to 4.2 million requests by the end of March. Of the additional

\$650 million Congress allocated to the coupon program, \$490 million will be used to supply consumers with an additional 12.25 million coupons.<sup>2</sup>

We have come a long way. In our annual survey, the Consumer Reports National Research Center posed a number of DTV related questions to just over 38,000 of our subscribers.<sup>3</sup> In May, twelve percent of our subscribers indicated they rely on over-the-air broadcasts. Of these respondents, we found that eighty five percent were prepared for the transition to digital broadcasts. Last week, Nielsen Media Research reported that 3.1 million households remain unprepared for the transition.<sup>4</sup> That number is down from 7.75 million homes in December of 2008.<sup>5</sup> Millions of consumers have been able to access the federal coupon program to prepare for the transition due to the *DTV Delay Act of 2009* and the subsequent hard work of FCC and NTIA.

However, there is still work to be done in the nine days between today and June 12<sup>th</sup>, and afterwards. Reception and signal strength issues continue to loom large with consumers. Among the respondents who relied on free over-the-air broadcasts and had been prepared for the transition, *Consumer Reports* found:

- 16% had to purchase a new indoor antenna
- 8% had to install a new outdoor antenna to receive an adequate signal
- 17% reported losing some channels
- 20% found it difficult to get their antenna to receive the stations that were supposed to be currently available at the time when the respondent took our survey.

We urge the agency to continue to prioritize education efforts aimed at troubleshooting reception and signal issues.

Although much has changed in the few months since a crisis loomed in February, some issues have stayed the same. We continue to receive consumer complaints resulting from incomplete and sometimes misleading advertisements by cable companies, which present cable subscriptions as the primary option

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<sup>2</sup> Testimony of Anna Gomez, Acting Assistant Secretary, NTIA. Before the Committee on Energy and Commerce, Subcommittee on Telecommunications and the Internet, US House of Representatives. March 26, 2009. [http://energycommerce.house.gov/Press\\_111/20090326/testimony\\_gomez.pdf](http://energycommerce.house.gov/Press_111/20090326/testimony_gomez.pdf)

<sup>3</sup> These results reflect the responses of *Consumer Reports* subscribers and, therefore, may not be representative of the general US population.

<sup>4</sup> Nielsen Media Research. Media Advisory, "3.1 Million TV Households Still Completely Unready for DTV." May 27, 2009. <http://blog.nielsen.com/nielsenwire/wp-content/uploads/2009/05/dtv-alert-5-24-09.pdf>

<sup>5</sup> Nielsen Media Research. *Analog-Digital Transition Readiness Report*. Provided to Consumers Union under contract, January 2008.

to navigate the transition and failing to mention other low-cost options available to consumers. For example, our colleagues at the *Consumer Reports* Money Blog point to a Cablevision ad modeling a public service announcement<sup>6</sup>—which has been around, and criticized, since last year.<sup>7</sup> The company offers a “deal” to those who want to sign up for cable service, but when our editors called, they offered him a \$53-a-month plan that climbs to \$73 after the first year. It took a good amount of probing to get the call representative to even mention their cheapest basic plan (\$17 a month, plus a \$34 installation fee). For consumers, this transition is complicated enough without industry ads trying to take advantage of the confusion. We urge cable companies to stop using this mandated transition as an advertising opportunity and join other industry partners in educating consumers about *all* available options.

We also continue to hear from community groups whose members report being sold more expensive and sometimes unnecessary equipment by retailers. The federally mandated DTV transition should not be an opportunity to make money on the backs of cash-strapped consumers. We urge retailers across the country to follow the examples of retailers like Mosquito Productions in Minnesota, Fred Meyer in Seattle; as well as H.E.B. and Best Buy in San Antonio by signing the “No Cost Box Pledge” and committing to carrying at least one \$40 converter box option for consumers.<sup>8</sup>

We applaud the Commission for quickly and effectively turning around the DTV transition and assisting millions of households in navigating the switch to digital broadcasts. As June 12<sup>th</sup> quickly approaches, we offer the following observations to the Commission:

- (1) While civil society organizations and direct service agencies have clearly taken the lead in providing on-the-ground assistance to consumers in need, community groups report a demand for local elected officials to play a larger part in DTV transition education efforts. We invite the agency to continue using its bully pulpit to urge municipal leaders to play a larger role.
- (2) The transition is most expensive for rural consumers. After traveling longer distances to get to electronics retailers, the lowest cost converter box and antenna options are often sold-out. We advise the agency to consider this while continuing to implement search-and-rescue style

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<sup>6</sup> *Consumer Reports*. “Cablevision still using DTV switch to hawk its service”. May 12, 2009.

[http://blogs.consumerreports.org/money/2009/05/cablevision\\_digital\\_dtv\\_conversion\\_avellar\\_misleading.html](http://blogs.consumerreports.org/money/2009/05/cablevision_digital_dtv_conversion_avellar_misleading.html)

<sup>7</sup> Huff, Richard. “Cablevision sends us a little scare package over digital switch”. *Daily News*. November 7, 2008.

[http://www.nydailynews.com/entertainment/tv/2008/11/07/2008-11-07\\_cablevision\\_sends\\_us\\_a\\_little\\_scare\\_pack.html](http://www.nydailynews.com/entertainment/tv/2008/11/07/2008-11-07_cablevision_sends_us_a_little_scare_pack.html)

<sup>8</sup> Ahmed, Omar. “More N.M. retailers need a better approach to DTV transition”. *The New Mexico Independent*. April 15, 2009. <http://newmexicoindependent.com/24952/more-new-mexico-retailers-need-a-better-approach-to-dtv-transition>

Olson, Rob. “DTV Day of Action in Minneapolis”. My FOX 9, Twin Cities. April 17, 2009.

[http://www.myfoxtwincities.com/dpp/news/DTV\\_Day\\_Minneapolis\\_Apr\\_17\\_2009](http://www.myfoxtwincities.com/dpp/news/DTV_Day_Minneapolis_Apr_17_2009)

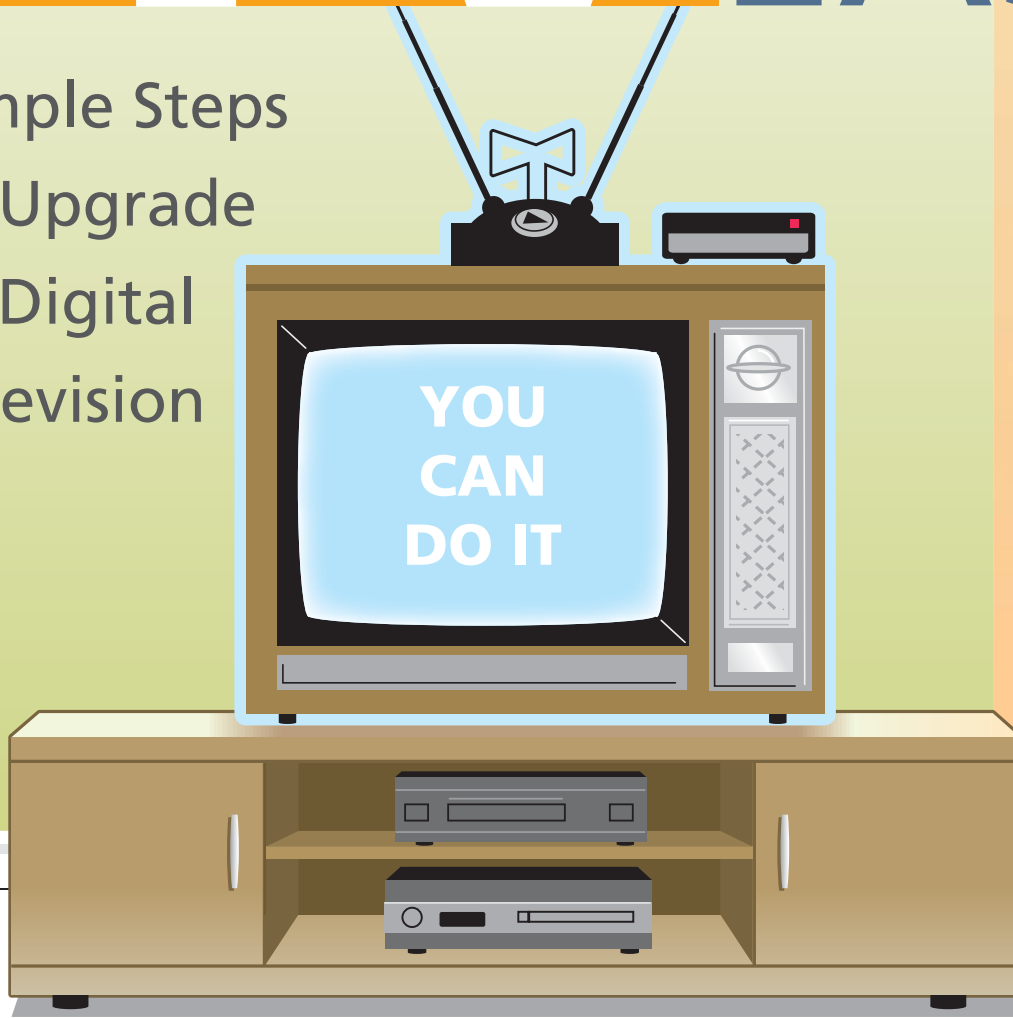
programs targeted at the difficult to reach households that have yet to take action by working to ensure mobile DTV teams focus on under-resourced rural areas and urging retailers to provide a range of boxes at accessible stores in appropriate quantities.

- (3) Once consumers obtain a converter box many need help setting it up. Working with the FCC, *Consumer Reports* was able to publish a guide to help consumers with several set-up scenarios. However, sometimes elderly or non-English speaking consumers need in-person assistance. The FCC walk-in centers, as well as partnerships with local firefighters, meals on wheels and AmeriCorps have been invaluable resources for consumers in this regard. We hope those centers and partnerships remain after June 12<sup>th</sup> to help the consumers that will inevitably still need assistance.

Thank you. I look forward to answering any questions you may have and Consumers Union remains committed to continuing to work with the agency past June 12<sup>th</sup> to help consumers in need of assistance.

# DTV MADE EASY

## 5 Simple Steps to Upgrade to Digital Television



- **Choose** the right converter box
- **Hook up** your antenna
- **Scan** for digital channels
- **Get the best FREE TV reception**

Brought to you by **ConsumersUnion**, the publisher of Consumer Reports, and the **Federal Communications Commission**

# WELCOME TO DIGITAL TV



Americans are now making a historic change in how we receive news and entertainment over the airwaves. We're switching from analog TV broadcasts to the new *Digital TV*, or DTV, which will make free TV viewing better than ever. Most people are already prepared for the switchover. But millions of Americans with older television sets connected to antennas still need to make some changes to keep receiving programs for free. This easy-to-follow guide will help you figure out if you're ready or not, and then lead you through five simple steps to make sure you're getting the most out of the exciting new 21st-century DTV broadcasting.

A handwritten signature in blue ink that reads "Michael J. Copps". The signature is fluid and cursive, written over a white background.

Michael J. Copps, Acting Chairman  
Federal Communications Commission

## C O N T E N T S

Why are we going digital? .....	3	Step 4	See if you need a new antenna	10
Step 1 Find out if you are DTV-ready .....	4	Step 5	Scan for digital channels .....	12
Step 2 Decide if you want a new TV or a digital converter box for your current set .....	5	HELP	Troubleshooting tips .....	13
Step 3 Connect the converter box .....	7		Get the most out of DTV .....	14
			For more information .....	Back cover

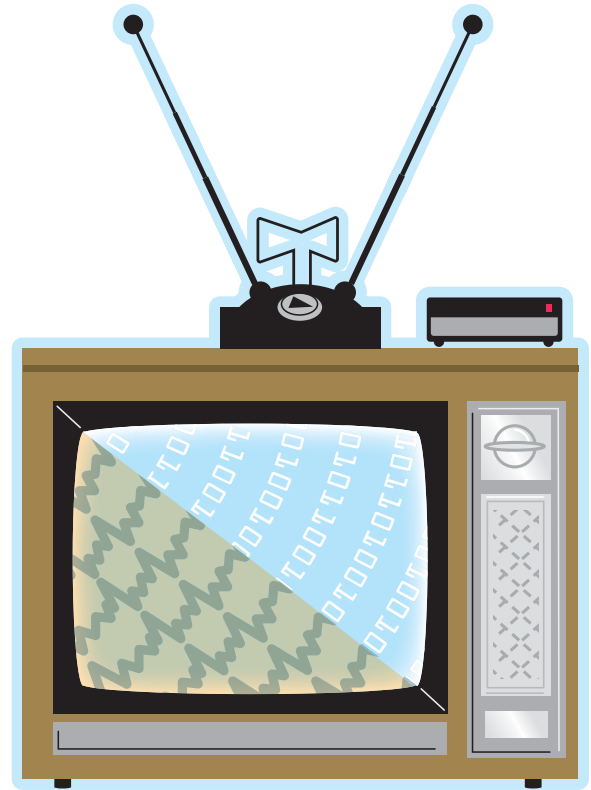
# WHY ARE WE GOING DIGITAL?

As you probably have heard, American television is undergoing its biggest change since regular over-the-air broadcasts began more than 60 years ago. By June 12, most TV stations will have discontinued the analog broadcasts we've watched for decades, joining those that have already gone to all-digital broadcasts. At that point, every full-power station in the country will transmit only digital TV (DTV) signals.

**There are many good reasons for moving to digital.** DTV will enhance day-to-day TV viewing, with more free channels and better picture and sound quality. The transition to digital broadcasts also frees up space on the airwaves, enabling better public-safety communications, improved emergency response, and faster wireless Internet services.

**You might have to take some action.** To enjoy this new, improved viewing, you must either have a newer TV set or a converter box that enables your older TV to receive digital signals from an antenna. It may take a little effort to get the right setup initially, with occasional updates to get all available channels. Any TV connected to a for-pay service from a cable, satellite, or phone company should continue to work as it does now. See the next page for more detail.

**That's where this booklet comes in.** In the pages that follow, we simplify the process of upgrading to digital TV. First, we'll help you determine if you are already "DTV-ready" and don't need to do anything more to enjoy digital TV's advantages. If you aren't ready, we'll help you evaluate your options: either buying a new television set or buying a



converter box that will work with your current TV. We'll help you get the best reception from your existing antenna; if your antenna won't work, we'll step you through the process of buying a new one. Finally, we offer tips that can help nearly everyone get the most out of DTV.

## ADVANTAGES

- More free channels and programs.
- A sharper picture, even with an older TV set.
- Clearer, better sound.
- An onscreen program guide.
- Enhanced closed captioning.
- Better public-safety and emergency-response systems.
- Improved high-speed wireless Internet.

## DRAWBACKS

- To get free DTV by antenna, you need a newer digital set or a converter box for your older TV.
- You may also need a new antenna.
- It can take some effort to set things up.
- You have to adjust the antenna and check for new channels periodically.
- Though you might gain new channels, you might lose some old ones.

TURN THE PAGE TO GET STARTED...



# STEP 1

## Find out if you are DTV-ready

### My TV is connected to a for-pay cable, satellite, or phone company service.

**If so, you're all set!** Any TV, no matter how old, will continue to work with cable, satellite, or phone-company TV service that you are already paying for. Most subscribers don't have to do anything to keep getting their usual TV programming. One exception: If your cable company discontinues all analog service (its own choice, not required by the government), subscribers who currently plug the cable directly into the TV may need to rent a cable box, usually for \$5 to \$7 a month. (This is not the same as a DTV converter box, which is used with an antenna.) The cable company must notify affected consumers and offer the equipment they need. However, most cable companies are expected to continue analog-cable service, and they cannot require you to get a box or upgrade to digital cable to get the local channels you now receive. They can, however, move some cable channels to a higher tier that requires a box. One more issue: Some satellite subscribers who get local channels from their own antenna, not a satellite feed, might need additional equipment to use with an analog TV. Call the satellite company to see if your setup will continue to work.

### My TV set has a built-in digital tuner AND it is connected to a UHF/VHF antenna.

**You're also good to go!** Nearly all TVs bought in the past three or four years, especially LCD or plasma sets, have a digital tuner. If you're in doubt, look in the TV's user manual for words such as "Integrated Digital Tuner" or "DTV" or "ATSC." But note: your TV *must* be hooked up to an antenna that can pull in both UHF and VHF signals; simple rabbit ears with only two arms won't work (go to Step 4 for more on antennas). Even with a good antenna, you have to reposition it and scan for channels periodically to be sure of getting all channels (see Step 5).

### I have an old-style analog TV set that receives free broadcasts over an antenna.

**You need to act now!** TVs that are more than three years old, especially picture-tube sets, almost certainly do not have a digital tuner. If you have an older set that is connected to an antenna, you can use it to watch digital broadcasts *only* if you connect it to a DTV converter box and a UHF/VHF antenna, or subscribe to for-pay service from a cable, satellite, or phone company. The other option is to buy a new set. Go to Step 2 for more advice.

## Why screen shape matters

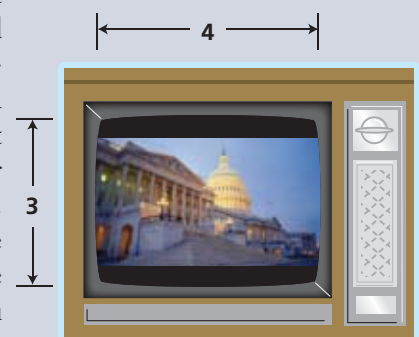
Before digital TV came along, all TV screens had the same shape and all programs filled the screen completely. That isn't the case with DTV. Both TV screens and programs now come in two shapes—squarish or widescreen—so a given program might not always fit the screen perfectly.

The shape of a screen is called its "aspect ratio." An older TV has an aspect ratio of 4:3, which means the screen is 4 inches wide for every 3 inches in height, giving it a somewhat squarish shape. Newer "widescreen" TVs have an aspect ratio of 16:9, so they're much wider than they are tall, more like a movie-theater screen.

If you watch a widescreen digital broadcast—such as most prime-time shows on the major networks—on an older TV, you will see dark bars above and below a small image. This is sometimes called "letterboxing" (see the example at right). But a 4:3 program will still fill your screen completely. Conversely, a widescreen digital program will fill the screen of a widescreen digital TV, but you will see dark bars on both

sides of the picture when watching a 4:3 program like a re-run or some daytime programming. This is sometimes called "pillar boxing" (see far right).

New digital TVs and converter boxes let you stretch or zoom the picture to suit your screen shape and eliminate the bars. However, the images will either look somewhat stretched or squished, or the edges will be cut off. This might bother some viewers, so try to see how it looks before you decide what type of set to buy, if at all possible. Most digital standard-definition TVs have a



A widescreen program on a 4:3 TV will have bars above and below unless you change the aspect ratio. See page 14.

# STEP 2

## Decide if you want a new TV or a digital converter box

### If you want a new TV

Buying a new digital TV is the easiest way to get DTV and may offer the best viewing. A less-expensive option is to use a converter box with your current set. See the next page if you prefer that money-saving approach.

All new TVs in stores today have a built-in digital tuner, so they can receive free digital TV signals from a UHF/VHF antenna without extra equipment, such as a converter box. But the smallest, most basic digital set will cost you at least \$100 and you cannot use a DTV coupon to buy one.

Most digital TVs are high-definition sets (HDTVs), but there are digital standard-definition TVs (SDTVs), which might be labeled as “480i” sets. This is the cheapest type of DTV. Most are picture-tube sets with squarish screens that measure 13, 20, 24, or 27 inches diagonally. Some are “combo units” that have a built-in VCR or DVD player. You’ll find SDTVs at mass-market and big-box stores.

An HDTV can display high-definition pictures, better than what you see on an SDTV, but it costs more. Most HDTVs are slim, widescreen LCD and plasma sets labeled as “720p” or “1080p.” The most basic set of this type, an LCD set with a 15-inch screen, costs a few hundred dollars. Bigger LCD and plasma sets cost much more. Electronics stores and other retailers carry sets of this type. Once you’ve got your new TV, skip to Step 4.



4:3 screen, while most high-definition TV sets have a wide screen. Keep in mind that there is now a mix of 4:3 and widescreen programming, but over time, more programming will be 16:9.



A 4:3 program on a widescreen TV will have bars on both sides unless you adjust the image size.

### BUYING ADVICE

- If you want the most screen for the money, and you have room for a boxy set, buy a picture-tube SDTV.
- If you want the best picture quality possible—as good as or better than you can get from cable—spring for an HDTV.
- For a main TV that will generally be watched by several people, a 27-inch or bigger screen is usually a good choice.
- Consider screen shape when deciding what TV to buy. Most SDTVs have squarish screens, while most HDTVs have wide screens.

If you can spend...	Your choices include
\$100 - 300	SDTV tube set, 13 - 27" screen
\$200 - 300	HDTV LCD set, 15 - 19" screen
\$300 - 500	HDTV LCD set, 26 - 32" screen
More than \$500	HDTV LCD or plasma with 37"+ screen

# STEP 2

(Continued)

## If you want a converter box for your current TV

You can keep receiving TV broadcasts on your old TV by connecting it to a DTV converter box and a UHF/VHF antenna. Converter boxes sell for \$40 to \$80, but you can use a \$40 government coupon to cover some or all of the cost. (See “Get a \$40 coupon” below.)

Consumer Reports has tested more than 40 converter boxes and found that all were able to convert digital signals from an antenna into analog signals compatible with an older TV. Picture and sound quality were better—with some models, much better—than analog broadcasts provide.

All boxes have an onscreen program guide, but some give you more information than others. Some also make it easier

to adjust closed captions. Another plus: Certain boxes enable you to add individual channels without redoing the “scan for all channels.” (See Step 5.) A VCR timer is handy if you like to record programs when you’re not home. A feature called analog pass-through sends both converted digital signals and analog signals to the TV. In many areas, low-power stations will continue analog broadcasts indefinitely. You might be watching such stations without knowing it. We strongly recommend you buy a box with analog pass-through. If you already bought a box without that feature, see page 8 for setup advice. Visit [www.ConsumerReports.org/DTV](http://www.ConsumerReports.org/DTV) for a list of boxes with these and other features.



Use the cable that came with the box to connect the TV, or...

...if your TV has A/V inputs, use these instead of the RF out. The right and left audio outputs will give you stereo sound.

Plug the coaxial cable from the antenna here.



Plug the power cord in here.

## BUYING ADVICE

- You’ll receive a list of local stores with your coupon. Most stores have only a few models, but you can also use your coupon to shop online. Search for approved online retailers and stores in your ZIP code at [www.dtv2009.gov/VendorSearch.aspx](http://www.dtv2009.gov/VendorSearch.aspx).
- Don’t think a higher price equals better quality. Some low-priced models tested by Consumer Reports were among the best for picture quality. Go to [www.ConsumerReports.org/DTV](http://www.ConsumerReports.org/DTV) to see free Ratings.
- Consider features, which vary by model. We highly recommend choosing a model with analog pass-through (see above). Also, see if you need a VCR timer.

## Get a \$40 coupon

Every household in America is eligible to receive two \$40 government coupons to buy two digital-to-analog converter boxes. (You can’t use two coupons for one box. Nor can you use a coupon for a new TV or for a cable or satellite box.) If you have a coupon that expired, you can reapply for a new one.

To request a coupon, call toll-free 888-388-2009 or apply online at [www.dtv2009.gov](http://www.dtv2009.gov). If you buy a box and return it, you won’t get your coupon back, or a refund for the \$40, but the retailer might let you use the \$40 credit to buy another box.

# STEP 3

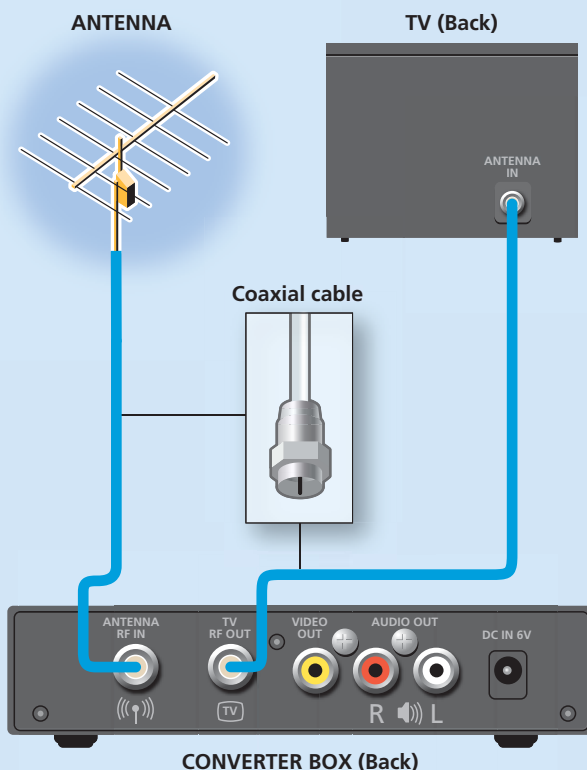
# Connect the converter box

Setting up a converter box is easier than you might think. Basically, you connect the antenna to the box and the box to the TV. Most antennas have a coaxial cable (a round cable with a single pin), which you plug into the converter box. You can use the same type of cable to connect the box to the Antenna RF input available on all but the oldest TVs. In fact, to use the analog pass-through feature on your box, you must use the RF In to watch analog channels on the TV. Otherwise, if your TV has A/V inputs (yellow video and red and white audio jacks), use them to connect the box to the TV

for better picture and sound quality. With this setup, press the Source or Input button on the TV remote, and choose Video In. Old antennas may use a flat cable with twin-lead terminals that screw onto the TV. You'll need adaptors to make these work with a converter box. The diagrams below show the simplest setup for watching digital broadcasts. On the next two pages, we show you two ways to use a converter box with a VCR, and how to watch both digital and analog stations on your TV using a converter box without analog pass-through. After setup, go to Step 4 (antennas).

## A If your antenna has a coaxial cable:

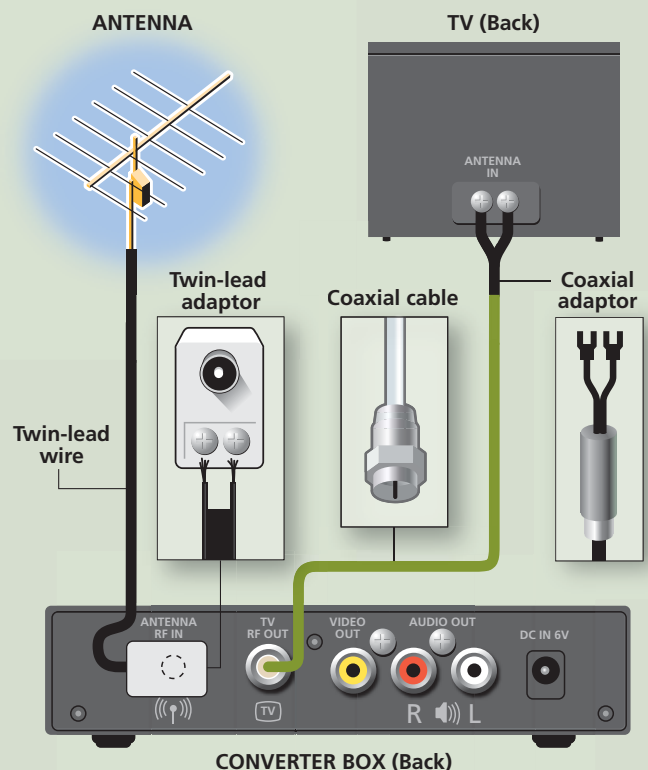
Plug the coaxial cable from the antenna into the Antenna RF In port on the converter box. Plug the coaxial cable that came with the box into the TV RF Out port on the box and the Antenna RF In port on the TV. Power up the box and TV. Tune the TV to channel 3 or 4 (whichever the user manual for the box indicates).



## B If your antenna has a flat cable with twin leads:

You'll need to purchase two adaptors; these do not come with the converter box. Attach the twin-lead wire from the antenna to one adaptor. Then plug the adaptor's coaxial connector into the Antenna RF In port on the converter box.

Plug the coaxial cable that came with the box into the TV RF Out port on the box and the coaxial port on the second adaptor. Attach the twin-lead output of the adaptor to the TV's Antenna RF In.



# STEP 3

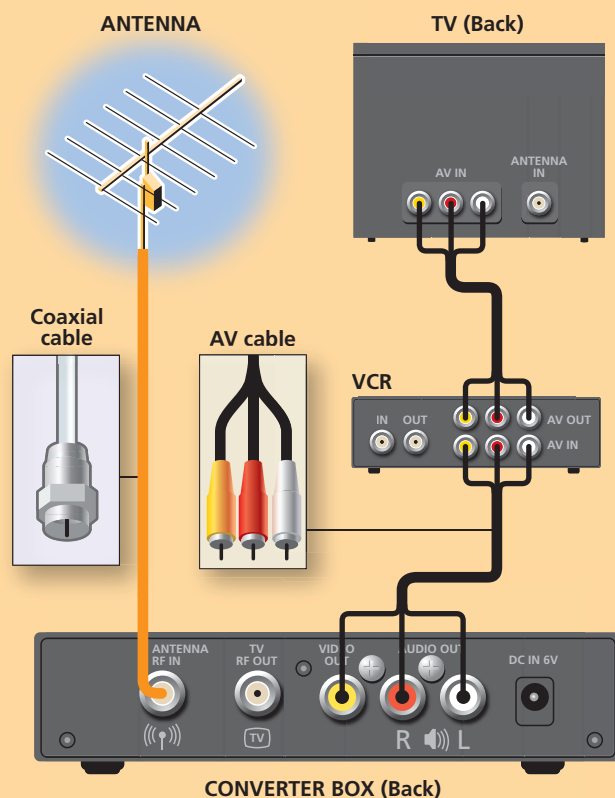
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## C If you want to watch and record the same channel using your VCR:

Plug the antenna cable into the converter box. Connect the yellow, red, and white A/V outputs to the same color inputs on the VCR, as shown in the diagram below. Use the three colored A/V outputs from the VCR to the TV's A/V inputs. If your TV doesn't have yellow, red, and white A/V inputs, connect a coaxial cable from the VCR's TV RF Out to the TV's Antenna RF In.

If you want to watch and record analog channels, and your box has analog pass-through, use RF connections between the converter box, the VCR, and the TV—not A/V connections.

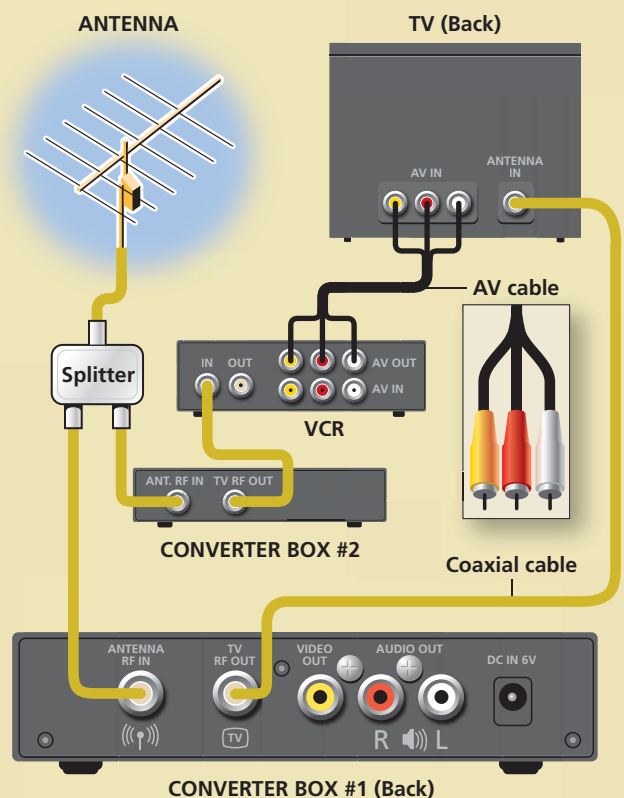
If you want the VCR to record programs when you are not home, choose a converter box with a VCR timer.



## D If you want to watch one channel while the VCR records another:

You need one splitter and two converter boxes (preferably different brands so one remote won't change channels on both boxes). Connect the cable from the antenna to the splitter. Connect one coaxial cable from the splitter to converter box #1's RF In, and from that box's RF Out to the TV's RF In. Take the second cable from the splitter and plug it into box #2's RF In. Connect the box's RF Out to the VCR's RF In and use A/V outputs from the VCR to the TV's A/V inputs.

To set up the first box, tune your TV to channel 3 or 4, as the converter box manual directs. To set up the second box, set your TV to Video In and tune the VCR to channel 3 or 4. To record a program, set the VCR to channel 3 or 4, and tune the converter box to the desired channel.



# STEP 3

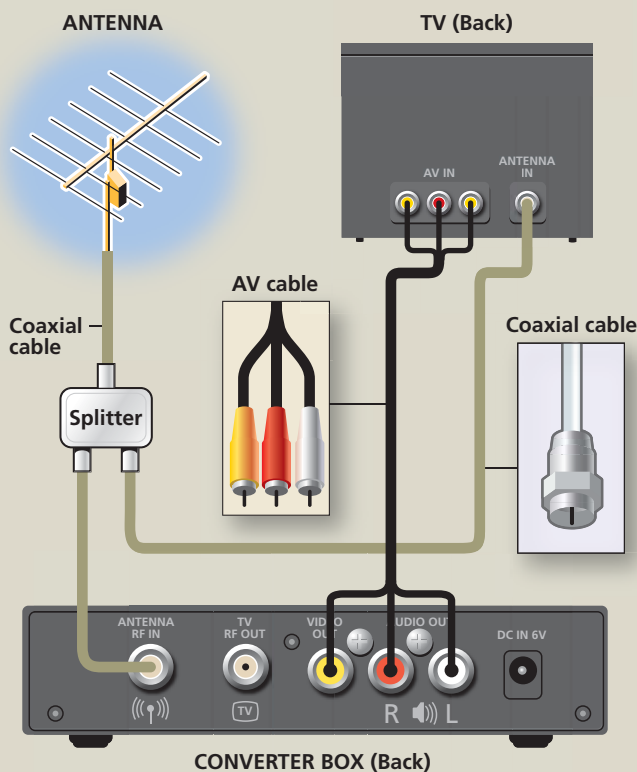
(Continued)

## E If you want to get digital and analog TV stations:

The simplest solution is to buy a box with analog pass-through and install it using basic setup A or B on page 6. See which boxes have this feature at [www.ntiadtv.gov/cecb\\_list.cfm](http://www.ntiadtv.gov/cecb_list.cfm). Those with analog pass-through are marked with an \*.

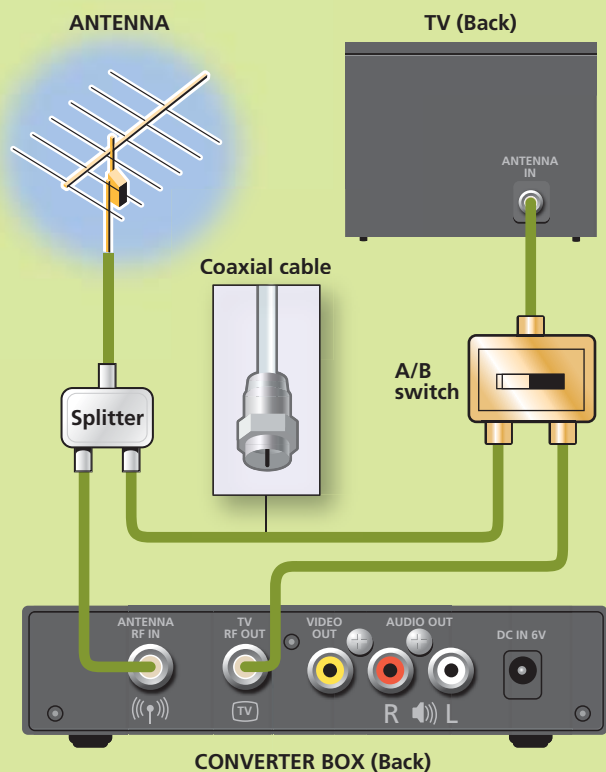
Otherwise, you need a splitter. Plug the antenna cable into the splitter. Connect one cable from the splitter to the converter box and another from the box to the TV. This will carry the digital stations.

Take the second cable from the splitter and plug it into the TV. Follow the diagram below if the TV has A/V inputs and an Antenna RF input. To watch digital stations, set the TV to Video In and change channels on the converter box. To watch analog programs, set the TV to TV In and change channels on the TV remote.



## F If you want to get digital and analog stations on a TV with only an RF input:

Again, getting a box with analog pass-through is the easiest way to receive both types of broadcasts. Otherwise, here's what to do. If your TV has only an Antenna RF input, you will need a splitter and an A/B switch. Follow the same steps as in setup E, but connect the box to the A/B switch and the switch to the TV, as shown below. To watch digital TV, set the A/B switch to position A and tune your TV to channel 3 or 4, then change channels on your converter box. To watch analog channels, set the A/B switch to position B and change the channel using your TV remote.



## STEP 4

# See if you need a new antenna

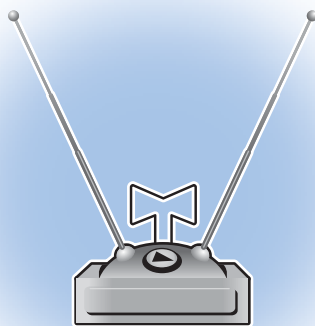
To get DTV broadcasts, you need an antenna designed to receive both VHF channels (2-13) and UHF channels (14 and higher). That's because many digital stations are actually broadcast in the UHF band, even though you can tune them in at the "virtual" channel number you've always used. It's a bit confusing, so trust us. You *must* have a UHF/VHF antenna, and it must point toward a station's transmitter.

Before you start shopping, see if your current antenna will work with DTV. If you now get clear reception on channels 14 and up, there's a good chance it will pull in digital stations. You may need some trial and error to find out.

### Your antenna may work

**An outdoor antenna mounted on your roof will probably work.** Connect the antenna cable to your converter box or DTV, following the instructions in Step 3. If it's safe to do so, make sure the antenna, cables, and connectors haven't been damaged or loosened.

**A small indoor antenna might work.** If your antenna has two arms and a wire loop or "bowtie," it can pick up UHF and VHF signals. Connect it as shown in Step 3; adjust it as explained on the next page. Ideally, a



UHF/VHF antenna will provide clear images. (A "rabbit ears" antenna with just two arms is designed to pull in only VHF stations. It generally will not get DTV channels in the UHF band.)

### But if it doesn't . . .

If you can't pick up channels even after adjusting the antenna and scanning for channels (as explained on the next two pages), then you need a new antenna. Don't be fooled by marketing come-ons suggesting you need an expensive "digital" or "HDTV" antenna. You don't. Any UHF/VHF antenna is technically capable of receiving DTV.

However, your location will determine which type of UHF/VHF antenna will work best for you. The distance from a station's transmitter, its direction, and the terrain near your home affect your ability to receive signals.

In areas with strong signals and few obstructions, a basic indoor antenna should be fine. If you live far from a TV station's transmitter or have trees, hills, or tall buildings nearby, you will probably need a more powerful indoor antenna or an outdoor antenna.

One shortcut is to see what works for nearby neighbors who have already made the switch to an over-the-air

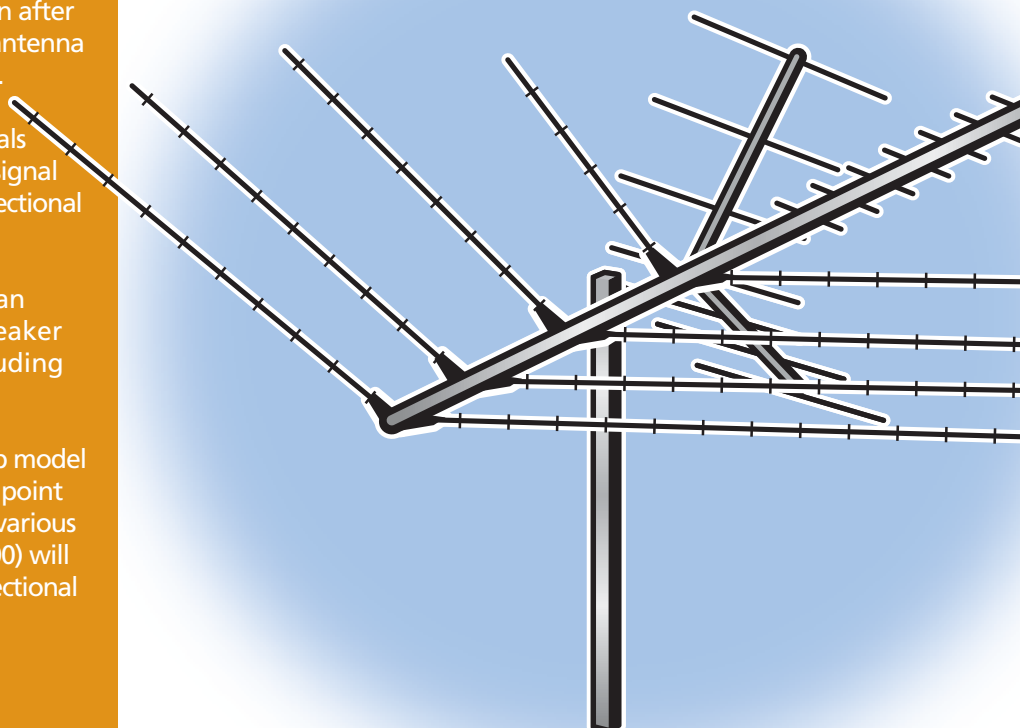
## BUYING ADVICE

**Indoor antennas.** Prices start at about \$20. Try a small, simple model first. If it won't work even after you adjust it, you may be able to return the antenna and buy a better one, so keep the packaging.

**Advanced indoor antennas.** When signals are hard to pull in, a set-top antenna with a signal amplifier may improve reception. An omnidirectional antenna can help in some situations as well.

**Outdoor antennas.** These are bigger than indoor models and better at pulling in weaker signals. Prices start at about \$40, not including the cost of mounting them on the roof.

**Advanced outdoor antennas.** A rooftop model used with a rotor (about \$60) enables you to point the antenna in different directions to pull in various stations. So-called smart antennas (about \$100) will adjust the position automatically. An omnidirectional antenna can help in some situations as well.



DTV setup. They may be able to offer advice on the most effective antenna for your neighborhood. If your surroundings are similar, odds are their solution will work for you.

An FCC Web site, [www.fcc.gov/maps](http://www.fcc.gov/maps), lists the signal strength you can get from local stations. You can get similar information from [www.AntennaWeb.org](http://www.AntennaWeb.org), a site run by the electronics and TV industries. However, you might not be able to pick up a digital version of an analog channel you had no matter what you do. See page 12 for more information.

## Don't get fancy

**Try an indoor antenna first.** In many cases, a basic model may be just fine. Once it's hooked up, scan for channels. You may need to perform several channel scans after adjusting the antenna and moving it around to get the best reception.

If you get few or no channels, no matter how much you adjust the antenna, see if you can return it and buy a better one, so keep the packaging. Indoor antenna prices start at about \$20.

When signals are hard to pull in, a set-top antenna with a built-in signal amplifier may provide better reception. This type of antenna can help if you have a 20-foot or longer cable connecting devices, because signals weaken with distance. It's also a plus if you split the signal to feed two converter boxes or a TV and a VCR.

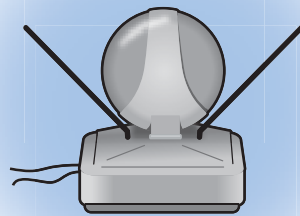
But keep in mind that an amplifier can't compensate for poor placement. You still have to adjust the antenna for optimal reception.

If you are trying to get broadcasts from two different directions—say two cities—an omnidirectional antenna can eliminate the need to adjust the antenna when you change channels. But stick with a unidirectional antenna if images are breaking up, or pixelating. This may happen if digital signals are

bouncing off trees, buildings, or hills.

**Use an outdoor antenna.** These are typically bigger and higher up than indoor models, which helps pull in weaker signals. Ideally, the antenna should be four feet or more above the peak of the house, pointing toward the transmitter. If that's not possible, mount the antenna as high as you can on the side of the house facing the TV station's broadcast tower. Prices start at about \$40. Installation would cost extra.

If you are still having trouble pulling in signals even with a standard outdoor model, you might need an advanced



antenna. So-called high-gain models are designed to improve performance. If you are trying to receive TV broadcasts from transmitters in opposite directions, a rotor can be used to point a rooftop antenna in the direction of the channel you want to watch. Prices for rotors start at about \$60. An omnidirectional model (about \$75 and up) that is designed to receive channels equally well from all directions is another possibility.

A “smart” antenna (about \$100 and up) is a directional antenna that automatically aims itself toward the transmitter for the station you've selected. Make sure the DTV converter box you have includes a special input designed to work with a smart antenna. Not all models do.

# Adjust your antenna

## Location, location

It takes patience, trial, and error to get optimal reception. You might have to adjust the antenna when you switch from one channel to another, depending on the location of the station's transmitter. In some cities, most or all towers are in the same vicinity. In other areas, or if you live between cities, towers may lie in opposite directions. You would either have to reposition the antenna toward the desired station or use an omnidirectional antenna instead.

The FCC Web site [www.dtv.gov/maps](http://www.dtv.gov/maps) can help you position your antenna for the best reception. Enter your ZIP code or address to see a list of local stations. Click on a station and you'll see its signal strength and the direction of its transmitter. At [www.AntennaWeb.org](http://www.AntennaWeb.org), key in your address and you'll also see the distance to a station. An amplifier can help if it is more than 20 miles away.

## Indoor antenna

Make small adjustments and give the tuner in the converter box or DTV a moment to “catch up” and detect the signal. Use the signal-strength meter on the converter box or DTV to see what position is best. Moving the antenna a few inches can help. You may also improve reception by moving the antenna higher up or near a window, though you might need a longer cable to reach the TV.

## Outdoor antenna

For best performance, mount the antenna on the roof. (To avoid the risk of falling, professional installation is recommended.) You can mount an outdoor antenna in the attic, but reception might not be as good. A rotor that re-orientates an antenna in different directions lets you adjust a rooftop antenna from indoors.



# STEP 5

## Scan for digital channels

Whether you are installing a new digital television or hooking up a converter box to your old TV, you will need to scan for channels to ensure that you receive all the digital stations in your area. On most DTVs and some converter boxes you will need to use the onscreen menu to navigate to a “setup” or “channel” page where you will be able to search for channels. Many converter boxes simplify this process by automatically bringing up a “setup wizard” the first time you power up. This guides you through basic settings and adjustments, including a channel scan.

**Once the scan is complete**, you should see a list of the stations that have been detected. You can also flip through the channels to see what you have. You might have several channels from one station, each carrying different programming. To reach these “subchannels,” use the up/down channel button on the remote or key in 2 followed by a dot or hyphen plus 1, 2, and so on (2.1 or 2-1, for example).

**But you might get few or no channels on the first try.** Don't be alarmed. DTV broadcasts can be harder to pull in than analog signals. If you have so-so analog reception now, with snow and static, you might not get any picture at all with the digital version of that channel. Instead, you might see a screen that says “weak or no signal.” Next steps . . .

**If you're missing only a few channels**, you might be able to add them individually by entering the number on the converter box remote. Note that you must enter the actual broadcast frequency, not the “virtual” channel number you are familiar with. Either call the station and ask for the broadcast frequency or check online at [www.nab.org/AM/](http://www.nab.org/AM/)

[ASPCode/DTVStations/DTVStations.asp](http://ASPCode/DTVStations/DTVStations.asp). Use the signal-strength meter on the converter box or DTV to see which antenna adjustments yield the strongest signals. In some cases, you must rerun the scan. Check the directions that came with the box or DTV you purchased.

**Keep in mind** that you might not be able to pick up a digital version of an analog channel you used to have no matter what you do. That's because the digital transmissions of some stations may cover a different geographic area than its analog broadcasts, or changes in its digital transmissions may make them harder to pick up at your location. Try the steps outlined earlier, adjusting your antenna and checking the signal-strength meter.

**If nothing works**, see if neighbors are able to get the digital channel you are missing when they use an antenna. If they can, there's probably a problem with your setup. If nobody can get it, that suggests signals from the missing station may not be reaching your area. Call the local TV station or check its Web site for information. (You can get a station's phone number at <https://dtvsupport.fcc.gov/dtvtools>. Click on “Channel Lookup.”)

**Scanning is not a one-time thing.** Rescan periodically to make sure you're getting all the digital stations available in your area, especially right after June 12, when the DTV transition is shifting into high gear. New stations may become available or existing digital stations may move to a new channel. In addition, some stations will be providing more powerful digital signals, so you might pick up a channel you were not able to get previously.



When you run a digital channel scan (shown here), the tuner in the converter box or DTV will detect channels the antenna pulls in. You might not get all channels with the first scan. Adjust the antenna and rerun.



As you adjust the antenna, check the signal-strength meter (like the one shown above) to see what position pulls in the strongest signals. The optimal position of the antenna may vary for different channels.

## No picture on any channel

- **Check that power is on.**
- **Check connections.** Be sure equipment is hooked up in the right order and connections are secure.
- **Tune in.** With a converter box, tune the TV to 3 or 4, or use the TV remote to switch to the video input. You should see a setup menu or picture.
- **Run a channel scan.** See Step 5.
- **Adjust the antenna.** See Step 4.
- **Check the antenna and its wiring.** Look for damaged or loose parts, especially on outdoor antennas.

## Picture but no sound

- **Raise volume control.** Turn up the volume on the TV and on the box, if it has adjustable volume (some don't).
- **Check the audio jacks.** If you are using the yellow video jack to connect

the converter box and TV, be sure the red and white audio jacks are connected. (Some TVs have only one audio jack; in that case, connect the white one.) Another option: Unplug the A/V inputs and see if you get sound by connecting the box to the TV's RF input.

## Can't get certain channels

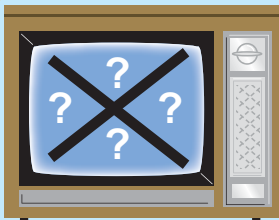

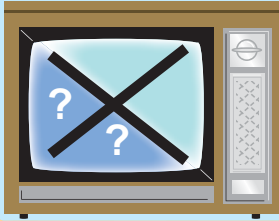
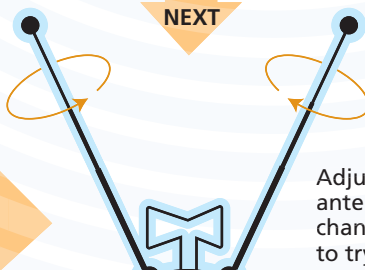
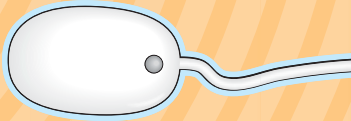

- **Adjust your antenna.** Slight adjustments can help. See Step 4.
- **Use a shorter cable.** Long cables can weaken the signal.
- **Remove a signal splitter.** A splitter cuts the signal strength sent to each device. Remove it temporarily. If that helps, buy a splitter with an amplifier.
- **Try a better antenna.** See Step 4.
- **See if neighbors get the missing stations.** In some areas, the "contour" or reception area of digital television

differs from the analog version, so DTV signals might not reach all areas that got the analog signals. If your neighbors get a station you can't, it's likely your setup. If nobody can get it, call the local TV station to see why.

- **Try again after June 12.** Some stations will increase the power of digital broadcasts once they stop analog broadcasts. That might enable you to get digital channels you can't get now, so rescan. Until then, to watch analog channels: If your box has analog pass-through, use the RF input on the TV. If it doesn't, see page 9.

## Picture/sound cuts in/out

- **Check cables.**
- **Adjust the antenna.** Use the signal-strength meter to find the best position as you make adjustments.

PROBLEM	FIX	HELP
 <p data-bbox="159 1507 435 1556">You are not receiving any TV channels.</p>	<p data-bbox="586 1268 667 1293"><b>CHECK:</b></p> <ul style="list-style-type: none"> <li>• Converter box set-up</li> <li>• Is antenna connected to antenna input on converter box?</li> <li>• Is converter box plugged in and turned on?</li> <li>• Is output from converter box connected to input on TV?</li> <li>• Is TV set to channel 3 or 4?</li> </ul> 	<p data-bbox="1179 1268 1252 1293"><b>GO TO</b></p> <p data-bbox="1179 1297 1382 1325"><a href="http://www.dtv.gov/maps">www.dtv.gov/maps</a></p>
 <p data-bbox="159 1873 435 1921">You are receiving some channels but not others.</p>	<p data-bbox="672 1654 737 1682"><b>NEXT</b></p>  <p data-bbox="829 1816 1084 1921">Adjust/reposition antenna and rescan for channels (you may need to try this several times).</p>	 <p data-bbox="1295 1535 1328 1562"><b>OR</b></p>
		<p data-bbox="1295 1619 1349 1646"><b>CALL</b></p> <p data-bbox="1295 1650 1479 1766">1-888-CALL-FCC to check which channels you may be able to receive.</p> 

# GET THE MOST OUT OF DTV

Living with DTV day to day will be a learning experience for us all.

Try these tips to get the most out of the digital TV experience.

## Use A/V connections for better quality

Connecting the converter box to the TV using a coaxial cable into the RF input is often the easiest route, but use the yellow (video) and red and white (audio) connections if possible. Consumer Reports' tests show that using these connections generally produced better pictures and stereo sound. A few converter boxes also have an S-video connection. That can yield an even better picture, so use it if your TV has an S-video input. Again, you must use the red and white audio jacks to carry sound. One exception: If you are using a box's analog pass-through feature, you must use the TV's RF input to watch analog stations.

## Scan...and scan again

We can't say it enough: Keep on scanning. As the transition shifts into high gear, local TV stations may change their channel locations and add new offerings. Rescan often—definitely on June 12 and 13, and as much as once a week for a few months afterward—to receive all available DTV programming. (See Step 5.) If some channels disappear or you are not receiving channels that should have strong signals at your location, delete the programmed channels and run a complete new channel scan. Once things settle down, there should be fewer changes and less need to rescan.

## Be on the lookout for “subchannels”

The jump to digital broadcasts lets stations offer several channels of programming at the same time. For instance, if you've been receiving a particular station on channel 4, its primary programming may now be on channel 4-1, with additional program choices found on channels 4-2, 4-3, and so on. (These subchannels may appear as 4.1, 4.2, etc., with a dot instead of a hyphen.) Subchannels should come up automatically when you use the channel up/down button.

## Lose the bars

You don't have to live with bars if the shape of the TV program you're watching doesn't match the shape of your TV screen. You can adjust the image size and shape so it fills the

screen. Most DTVs and converter boxes offer a few aspect ratio modes, accessible through a button on the remote, often labeled “Wide” or “Aspect” (see page 4).

If you're viewing a 4:3 image on a widescreen TV, you can get rid of the pillar-box black bars by stretching the image across the screen (which makes objects and people wider) or zooming the image (which cuts off the edges of the picture). If you watch a widescreen image on a 4:3 TV set, you'll see horizontal bars above and below. Again, you can stretch (which makes objects and people tall and skinny) or zoom the picture.

The slight distortion these adjustments cause might not bother you. But see whether you like the way the picture looks after making these adjustments. Some viewers might rather live with a smaller image surrounded by black bars.

## With an HDTV, enjoy top picture quality

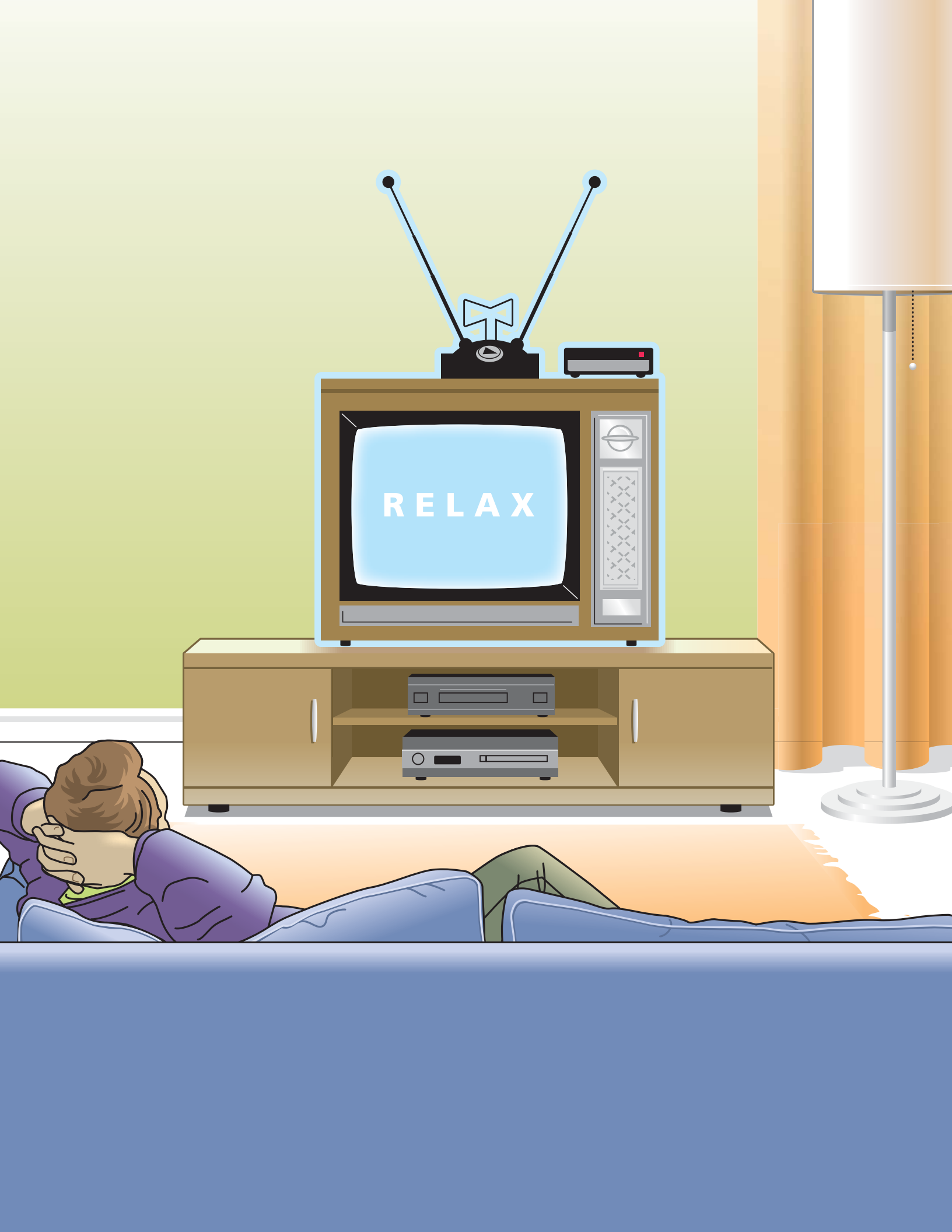
If your new TV is a high-def model, called an HDTV, you can get free high-definition broadcasts from an antenna. The quality can be just as good as your friends get by paying for cable, or even better! Most prime-time programs on the major networks are high-def, though reruns and daytime programming, along with the subchannels, might remain as standard definition for some time to come.

## Experience multichannel sound

Many HD broadcasts and most prerecorded DVDs are accompanied by theater-style 5.1-channel sound. If you have the budget, consider a home-theater system with multiple speakers that can give you the surround-sound experience.

## Adjust the TV picture

Most TVs are set for display in a bright retail store, using a picture or video mode called Dynamic or Vivid. This is usually a bad setting for home use. On the remote control, hit the menu button to access the video or picture menu, and scroll through the choices (some sets don't have modes, only individual settings). Consumer Reports recommends the Pro, Cinema, or Movie modes (names vary by brand).



RELAX

## GET MORE INFORMATION:

[www.dtv.gov](http://www.dtv.gov)

FCC Web site on DTV transition

[www.dtv2009.gov](http://www.dtv2009.gov)

NTIA TV converter box coupon program site

[www.dtvanswers.com](http://www.dtvanswers.com)

National Association of Broadcasters' site

[www.dtvtransition.org](http://www.dtvtransition.org)

Electronics industry consortium

[www.AntennaWeb.org](http://www.AntennaWeb.org)

Industry advice on antennas

[www.ConsumerReports.org/dtv](http://www.ConsumerReports.org/dtv)

Consumer Reports DTV guide

<http://www.nab.org/AM/ASPCode/DTVStations/DTVStations.asp>

Listing of digital channel numbers

[dtvinfo@fcc.gov](mailto:dtvinfo@fcc.gov)

FCC DTV transition e-mail address

1-888-CALL FCC  
(1-888-225-5322)

FCC DTV transition phone help line

Inclusion of this information does not imply an endorsement by the U.S. Government or the FCC of any specific product or service.

## Thinking about tossing an old TV? REUSE or RECYCLE instead!

Even if you buy a new digital TV, you can still use your old analog TV to watch VCR tapes or DVDs or to play video games. But if you prefer to get rid of the old set, don't put it in the trash. The lead and other toxins it contains are bad for the environment. See if your municipality or a local electronics store recycles electronic waste. To find such a program, visit [www.EIAE.org](http://www.EIAE.org) or [www.mygreenelectronics.com](http://www.mygreenelectronics.com).



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