



# OUT WITH THE OLD — TV, THAT IS!

Make sure you're prepared for the digital TV transition with this do-it-yourself installation project.

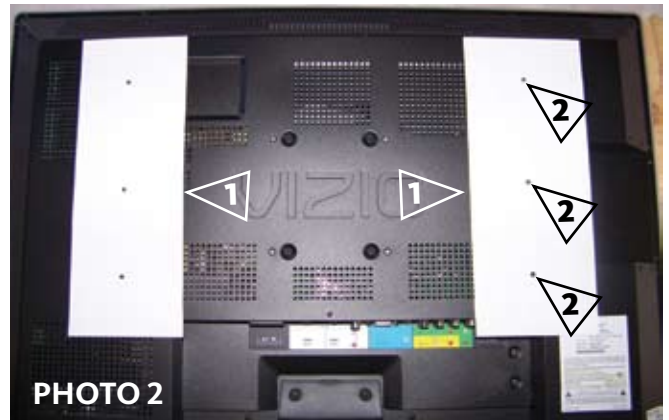
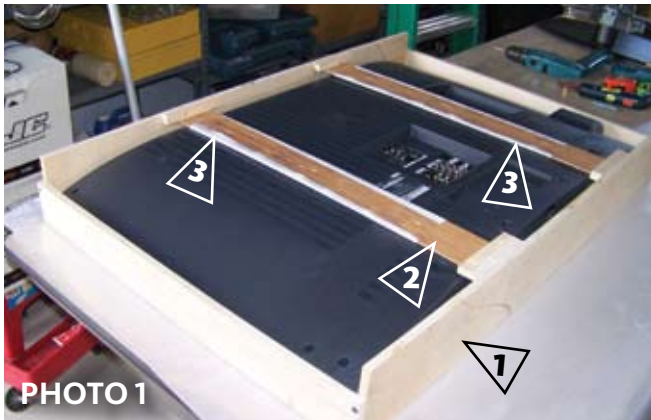
**W**hat's all the fuss about digital television? Well, on February 17, 2009, the Federal Communications Commission (FCC) has mandated that all full-power TV stations in the United States cease broadcasting analog signals. This presents one of the most significant changes ever in the television broadcast industry and has produced numerous questions and concerns from the public regarding what they need to do prior to the transition. One of the first things individuals should do is determine what type of TV(s) they currently have and whether they will be affected.

The FCC ruled that as of March 1, 2007, all new TVs must include digital tuners. So, if you purchased a TV prior to that date, there is a good chance it is an analog-only set and will need a converter box to receive over-the-air (terrestrial) broadcast signals. (See "Digital TV In A Box" on page 60.) It's possible that some TVs manufactured prior to that date contain both digital and analog

tuners, and it's also conceivable that some leftover inventory of analog-only TVs could have been sold after that date. The best ways to determine whether your TV has a digital tuner is to consult the owners manual; visit the TV manufacturer's Web site or call the company; or look at the TV and see whether there is an input connection labeled "digital input" or "ATSC," which stands for Advanced Television Systems Committee, the digital, or DTV, format. Keep in mind that the digital transition affects only over-the-air (terrestrial) reception. According to the FCC Web site, "Analog-only TVs should continue to work as before with cable and satellite TV services, gaming consoles, VCRs, DVD players, and similar products."

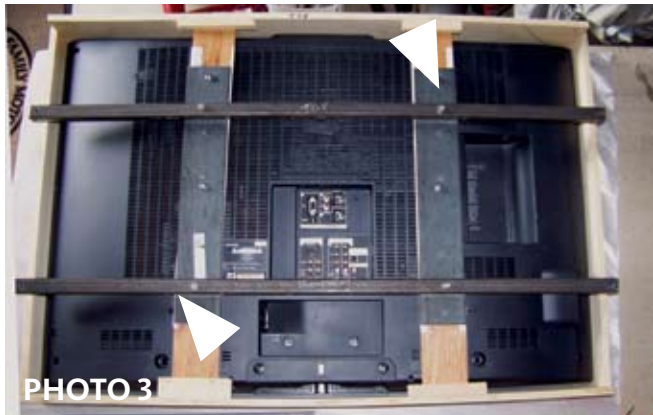
The move to digital broadcasting is just another step in progress, much as when vacuum tubes were replaced with semiconductors. When over-the-air broadcasting was first put to commercial use, radio signals were generated using amplitude modulation (AM) to form sound

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The mockup is made using 1/2-inch plywood for the frame (1); 1/4-inch plywood for the mounting hole location indicators (2); and sheets of paper folded over the 1/4-inch plywood to transfer the mounting hole locations from the TV to the plywood (3).

Position the paper over the mounting holes (1) and use a black marker to indicate the location of the mounting holes on the paper (2).



Bolt the metal mounting bracket to the mockup frame to ensure that all mounting holes were drilled properly.

(audio), but they were subject to interference from many electrical sources. Then frequency modulation (FM) was developed to deliver a clearer signal with better sound. The introduction of television added the picture video signal, and some of the by-products of the space program, plus technological advances with electronic components, brought forth digital signals. Using continuous bursts of a digital data stream, the signal being broadcast can be much cleaner and produce higher picture resolutions. With digital TV, you will no longer have to worry about poor reception. You either receive a good picture or no picture at all.

There are three levels of digital television quality. Standard

definition (SDTV) is the basic level of display and resolution quality for both digital and analog. Enhanced definition (EDTV) provides 480 lines progressive (480p) resolution. High definition (HDTV) features 720 lines progressive (720p) and 1,080 lines interlace (1080i) resolution. On smaller sets the resolution doesn't seem to make that much difference, but with screen sizes as large as 36 inches, and especially in the 50-inch-plus range, the resolution does become an important factor, as these larger sets usually are viewed in a bigger area.

Now that you have an understanding of what to expect when the analog signals go away in February 2009, and a basis to help decide between keeping the analog

set and purchasing a converter box or upgrading to a digital TV, I suspect that many folks will opt to upgrade as I did when our 8-year-old set started going downhill. There are several things to consider when selecting the replacement. The first is the location of the new TV in the motorhome.

If you choose to place the new TV in the same location as the old one, measure the space where the current TV is mounted (height, width, and depth). You will need to ascertain whether the TV can be surface-mounted against the outer edges of the cabinet or must be flush-mounted inside the cabinet. If you prefer that the TV stand on its own atop a cabinet, determine whether it can be secured for travel. Flat-panel sets are more prone to tipping over than the older, boxier sets. Are you going to stay with a standard-definition or enhanced-definition TV with no change in the coaxial cables? Or will you move up to a high-definition set with big changes in the cables? Will a custom-size mounting bracket be necessary? The wall mounting brackets available for the new flat-panel digital TVs are designed for certain weight ranges when installed on a stationary wall, but the bracket used in a motorhome application would need to be much stronger to handle the rigors of the highway.

First, let us deal with the size of the new TV. Go shopping with a notepad and a tape measure and make a list of



Position the wood stile onto the side of the TV frame using the double-sided tape. The stile is now ready to be attached to the TV using sheet-metal screws.

If the TV is to be flush-mounted, a thin strip of wood trim can be stained and attached to the exposed face with hook-and-loop fastening material.

sets that will fit the available space. It's likely that only a few available sets will fall within your guidelines. I selected a set with the largest available screen size that would fit within the outside dimensions of my cabinet opening. This happened to be a high-definition set, but I will not initially change all the necessary equipment to receive HDTV, keeping that as an option for later. I have been told that plasma TVs do not survive well in higher elevations, so I selected an LCD (liquid crystal display) set. These TVs don't generate quite as much heat, and there wasn't any significant price difference.

After purchasing the TV, operate it for a few days before installing. You really need to know that it works before installation, and if it works for a few days, it most likely will work through the usual one-year warranty period. If it does fail once installed, you can remove it and take it to the service center. There have been questions about the statements in some of the owners manuals that tell you not to install these sets in motor vehicles. Read the warranty for any such exclusion.

Now it's time to get the TV mounted. It's unlikely that the new set will bolt right up to the old mounts, so in order to position the new mounting bracket, it is probably best to start with the existing attachment points, since these should be placed into something substantial.

If the TV is to be mounted inside a cabinet, remove the stand from the set and lay the TV facedown on the thin foam bag that it came in. Using  $\frac{1}{2}$ -inch plywood, make a frame mockup of the outside dimensions and depth of the TV. In order to precisely mark the mounting holes in the TV, attach two 3-inch-wide strips of  $\frac{1}{4}$ -inch plywood to the frame so as to cover the mounting holes. (See **Photo 1.**) Remove the mockup frame. With adhesive tape, attach two pieces of white tablet paper to cover the mounting holes on the back of the TV. Using a black marker, place a black dot directly in the center of each available mounting hole. (See **Photo 2.**) Next, return the mockup frame to the TV and gently lift the tape from one side of the paper; fold the edge of the paper over the  $\frac{1}{4}$ -inch plywood strips; and retape the paper to the  $\frac{1}{4}$ -inch plywood. With one side secure, and being careful not to move the paper, fold the other side of the paper onto the  $\frac{1}{4}$ -inch plywood. Repeat for the other mounting holes. Now you have captured the location of the mounting holes onto the mockup frame. Drill the appropriate-size holes through the  $\frac{1}{4}$ -inch plywood at each location. This mockup will serve as your template for the mounting bracket. (See **Photo 3.**) You can use the mockup frame as a gauge for fabricating a metal bracket to attach to the TV mounting holes. A variety of mounting methods have been

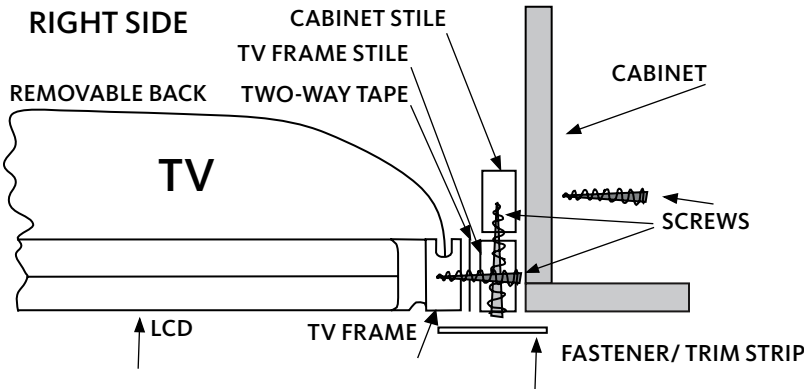
used by motorhome manufacturers, and you must employ a bit of imaginative innovation to adapt the bracket to your particular coach.

There is another, unconventional method of attachment that actually works very well and will greatly simplify a blind installation. With this method you will attach wood frames to the sides of the TV that then can be flush-mounted inside the cabinet or surface-mounted to the outside edges of the cabinet.

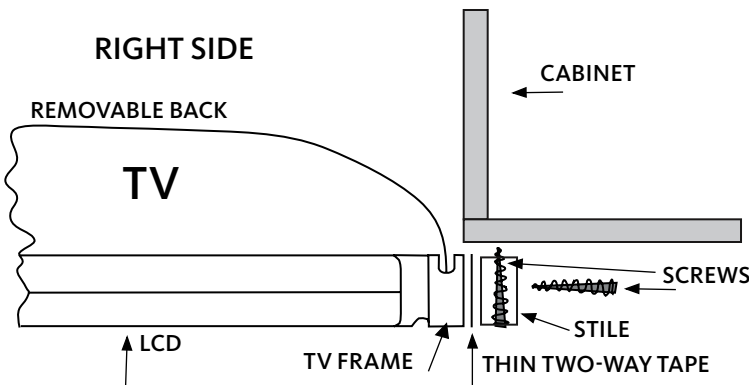
Begin by removing the back plastic panel from the TV. You will note that it has a substantial plastic frame around the perimeter. Into this frame you will attach wood stiles that measure approximately 1 inch by  $1\frac{1}{2}$  inch by the height of the TV (or of a size that will fill the space) to the sides of the TV using sheet-metal screws that penetrate only the plastic framework for no more than  $\frac{1}{2}$ -inch. (See **Photo 4.**) Put thin two-way tape between the wood stiles and the TV before attaching, and use screws spaced approximately every 2 to 3 inches apart. Leave off the back of the TV when selecting the right screw length so you can see that the penetration into the plastic is appropriate. Pre-drill the stiles and the TV using a  $\frac{1}{8}$ -inch drill bit for #8 flathead screws. For a surface-mount installation, the wood can be stained and finished to harmonize with the cabinet to which it will be

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## TOP VIEW - CROSS SECTION - FLUSH MOUNT



## TOP VIEW - CROSS SECTION - SURFACE MOUNT



attached. For a flush-mounted set, a thin trim strip can be attached with hook-and-loop fastening material. (See sketch and Photo 5.)

Leaving a little open space at the top and bottom may improve air circulation within the cabinet and will not detract from the appearance. If you have selected a smaller set and have vacant cabinet space behind it that you may want to utilize, a continuous hinge on one side and a couple of very sturdy fasteners on the other might be in order. If you have concerns about removing the back of the TV or drilling into the frame, use another mounting method.

After using the mockup to fabricate the metal mounting bracket, I carefully drilled the holes for the mount. The final attachments were carefully measured, the bracket installed on the TV, and, with a little help, the new TV with the mounting bracket attached was lifted

into place and fit like a glove. Even with the metal bracket, I chose the added support of wood stiles along the sides and used hook-and-loop fastening material to attach the trim. Screwing the wood stiles to the sides of the TV might raise some question of voiding the warranty, and this might be an issue.

Since I chose not to install the equipment necessary for high-definition TV at this time, I was able to connect the new set just like the old one. The coaxial cable attaches to the same relative terminal as the old TV. It connects to a threaded coaxial terminal marked "UHF - VHF Antenna."

If you are going to upgrade your system to HDTV, you might not find much high-definition programming from terrestrial broadcasts right now. At present, programs broadcast in high definition are spotty and may not be available all the time, and the

major networks are hit-and-miss even in larger cities. You still will be able to receive analog programming with a new TV until February.

If you choose to go with high-definition satellite TV, you will need to install the appropriate roof antenna and HD satellite receiver for either Dish or DirecTV for the United States (in Canada, Bell ExpressVu or Star Choice). A complete change in wiring will be necessary to feed the HD signal to the TV. At best, a new cable, either an HDMI (high-definition multimedia interface) or a five-wire component video, must connect each HDTV with each HD satellite receiver.

Provided with a new HD television are instructions and diagrams that describe different ways to configure the wiring for the various popular audiovisual components (VCR, DVD player, HD DVR, digital recorder, audiovisual receiver, personal computer). Unless you are very skilled with AV equipment, you likely will need professional assistance for a high-definition installation.

Using a terrestrial antenna, a search for digital stations in Denver produced only one in English, two in Spanish, and 19 in analog. Two months later I did the same scan from the same location and found seven digital and 14 analog, so these stations are converting now. As with HDTV, digital station selection at present is not very good but seems to be improving monthly, as all these stations must convert by February. I also was told by a reliable source that not all stations will broadcast high definition in 1080 resolution.

No doubt, the converter box option will be the most economical and least involved for most folks, but some of us need an occasional project to keep the gray matter active.

For more information regarding the digital TV transition, visit [www.dtv.gov](http://www.dtv.gov), [www.dtv2009.gov](http://www.dtv2009.gov), or call the Federal Communications Commission at (888) 225-5322. **FMC**