
Bill Crutchfield, Founder and CEO

Wall-mounting your flat-panel TV

We've developed this guide to help you wall-mount your flat-panel TV. Need more help? Our comprehensive and caring tech support is free with most orders. Or if you'd rather not do it yourself, we can set you up with a professional installer in your area. Please let us know if there's anything else we can do.

Bill Crutchfield

Flat-panel TVs offer some of the best pictures available, plus a sleek design that looks great in almost any décor. Their slender shape and light weight make them ideal for wall mounting. In this guide, you'll find pointers for a safe and easy wall-mount installation, plus step-by-step guidance on how to hide the wires for an uncluttered, elegant look. Crutchfield customers can also count on our Product Support staff for expert answers and help.

Before you get started

Make sure that you have a thorough understanding of local building and fire codes. You should be able to obtain a copy from your local government office. Make sure you know what's behind the wall before drilling or cutting. Read and follow the safety guidelines on page 2, as well as those in the owner's manual.

Can you do it yourself?

Take a look at the chart below. What kind of installation do you want to do? Do you feel confident with the skills and tools involved?

You should be able to do this…	…if you're comfortable with these household tasks…	…and know how to use these tools.
Wall-mounting your own TV	• hanging pictures • mounting shelving	• power drill and drill bits (see owner's manual) • measuring tape • level • stud finder • pencil • soft material (like a blanket) • you may also need a screwdriver, sockets and a ratchet (see owner's manual)
Routing the A/V cables inside your wall	• installing new light fixtures, phone lines, or security wiring in your existing home • wiring a whole-house computer network • patching and repairing drywall • touch-up painting	• power drill and drill bits • measuring tape • level • stud finder • drywall saw • utility knife • fish tape (longer runs may require 2 tapes) • electrical tape

Jump to the info you need

Need More Help?

Tech support is free with most orders. You can contact our Tech Support staff 16 hours a day (8 a.m.-midnight, Eastern Time), seven days a week. Their phone number is printed on your invoice.

Some people don't feel comfortable with certain aspects of the flat-panel TV installation process. If you need help getting started, visit

www.crutchfield.com/install

or call our A/V Designers at:

1-800-555-9407

and we'll set you up with customized, room-specific recommendations and install help, free of charge.

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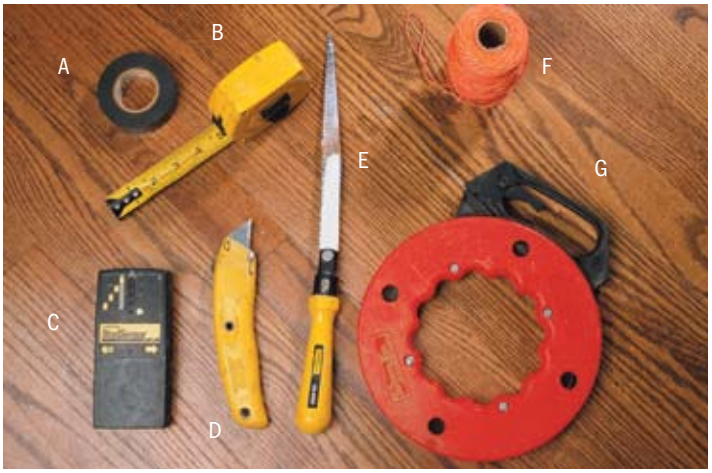

Some of the tools you'll need include: (A) electrical tape; (B) measuring tape; (C) a stud finder; (D) a utility knife; (E) a drywall saw; (F) string (for pulling wire short distances); (G) a fish tape (for pulling wire longer distances)

Fish tape: This tool allows you to pull cable behind existing walls, floors, and ceilings. It's sturdy and narrow, making it easier to "fish" through small spaces. In order to pull your A/V cables to another location, you'll need to tape the cables to the fish tape.

Take a look at the chart on page 1 to determine which tools you'll need. You'll also need a partner to help you with some of the installation steps. Please note that your TV's power cable isn't made to be safely installed in your wall — that means that if you want to keep that cable hidden, you'll need to hire an electrician to install a recessed AC outlet on the wall behind your TV. If you do hire an electrician, you could also ask him or her to pull your A/V cables.

Safety tips

- Be sure to use A/V cables that meet local building and fire code. Most codes require UL-rated wire labeled CL2 or CL3 for in-wall installations.
- Don't route your TV's power cable through your wall — it's not rated for safe in-wall installation.
- Make sure the area behind your wall is clear before cutting (using the techniques discussed on page 5).
- If you drill through a fire block or firebreak, patch it with comparable material. If you drill holes between floors, seal them with fire-resistant caulk per National Electric Code standards.
- Turn off the power in areas you'll be drilling or cutting to avoid electric shock.
- When working in the attic:
  - If it's not a finished attic, be careful to walk only on ceiling joists.
  - These areas are often poorly ventilated. Stay hydrated and use a fan to circulate air if you can. Make sure someone knows that you're up there, and take breaks when you need to.
- When working on a ladder:
  - Place your ladder in a stable position close to where you're working. Don't reach.
  - Always have one hand on the ladder.
  - Face the ladder when ascending or descending.
  - Don't carry heavy items up the ladder that could cause you to lose your balance and fall.
- Before you connect your A/V cables to your TV, make sure both your TV and the source component (ex: receiver, DVD player, etc.) are unplugged.

Mounting bracket shopping tips

Most TVs don't come with their own mounting hardware, so you'll have to purchase it separately. To find a mount that fits you TV, try entering in your TV's information at **www.crutchfield.com/mountfinder**. If you haven't already purchased your wall-mounting bracket, here are some tips to help you pick out the right one for your TV.

- Check your TV's owner's manual for mounting guidelines. Some models require use of a specific bracket, but most models are compatible with a number of brackets that follow VESA (Video Electronics Standards Association) standards. You'll see the word "VESA" followed by a number, which tells you how far apart the holes on the bracket or TV are in millimeters. For example, VESA 75 means that there are 4 holes in a square, and each side of the square is 75mm long. VESA 100/200 means that the holes are in a rectangle, with two sides measuring 100mm and two sides measuring 200mm. You should be able to find that information in the owner's manual, or you can measure the holes yourself. Many mounting brackets are compatible with more than one VESA standard, so finding one to fit your TV won't be difficult.
- Always check the screen sizes that the bracket says it can hold, and stay within the appropriate range. You should also to check the maximum weight a bracket can hold and make sure that it can support your TV.
- Think about what you want your bracket to be able to do. Do you want to be able to swivel the TV left and right to avoid glare, or get a better view from different seats? Do you want to be able to nudge your TV up and down in case you don't get the bracket exactly where you want it the first time? There are lots of options out there, so keep such conveniences in mind.
- Visit **www.crutchfield.com/TVmount** to shop for TV wall-mounting brackets.

Where to mount your TV

Obviously, your TV needs to be easily, comfortably viewable from your couch and other viewing spots. But what other factors should you take into consideration? Below, we've addressed two key points that are often overlooked.

Height

Ideally, the middle of your TV screen needs to be at about eye level while you're seated. You'll want to be comfortable while watching TV, and mounting it too high can result in neck strain. Plus, you'll see the best-looking picture when you view your TV head-on, rather than at an angle.

However, lots of folks find that mounting their TV that way looks too low, and move the TV up so that the middle of the screen is around standing eye level. If you do opt for a higher mount, try adjusting your seating to compensate. Move your couch further back so that you don't have to look up at such a steep angle, or recline when you're watching TV.

Screen glare

Sit in your favorite TV-watching spot and look at the place on the wall where you plan to mount your TV. Is there light reflecting off that area? If so, is it something fixable (by closing the curtains, or by moving a lamp)? Screen glare can be distracting, and detract from an otherwise beautiful picture, so be aware of potential sources of glare. A tilting or swiveling mount can also help you cut down on glare, by allowing you to angle the TV's screen away from the light source. You can find more tips at **crutchfield.com/TVplacement**

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Where you're going to run the wires

There are a number of ways to conceal your power and A/V cables — from quick and simple cover-ups to more labor-intensive in-wall options. It's a good idea to figure out how you'd like to manage your wires before deciding where to mount your TV, since some spots may be more conducive to your preferred method than others. You'll find an overview of some common options below. Also, see the illustrations on page 7.

- If you'd like to run your wires on the outside of your wall and keep your system looking neat, use a paintable cable race-way. It'll hide your TV's A/V and power cables between your set and an A/V cabinet below. See **crutchfield.com/wiremold**

One easy way to hide the wires between your wall-mounted TV and A/V cabinet is to use décor-friendly cable management raceways.

- If you need to run cables further than just straight down to your A/V cabinet, you might want to opt for a method that won't require drywall repair, like running wire behind your baseboard or crown molding (see the illustrations on page 7). By running your cables in places that won't require drywall repair, you'll save yourself lots of time and effort. Check out our article on "Tips and Techniques for Home A/V Cable Management" at **crutchfield.com/cablemanagement** for some simple options.
- If you want a professional look and you feel comfortable with the tasks described on page 1, in-wall wiring may be the option for you. You can find more details on in-wall wiring on pages 5-7. Here are some important things to consider before going that route :
  - Try to avoid mounting your TV on an exterior wall, since these walls have extra bracing and insulation that can make running wire difficult.
  - Obtain a copy of your local building and fire codes from your government office, and follow them. In many cases, this means you'll need to get **UL-rated A/V cable labeled CL2 or CL3**. The Underwriters Laboratory (UL) looks at heat generated from current flowing through wire, how quickly the cable will catch and spread fire when exposed to flame, and the wire's susceptibility to damage from external stresses.
  - **An important note about your TV's power cable:** If you're planning to route your A/V cables inside your wall, you might be tempted to run your TV's power cable in the wall as well. But those cables aren't designed or rated for safe in-wall use, and can pose a safety hazard. So if you want the power cable hidden, we strongly urge you to hire a licensed electrician to install a recessed AC receptacle in the wall, in a location where it will be covered by your TV, and not obstructed by the mounting bracket. You and your electrician may also want to consider an in-wall power protection unit, because these offer built-in surge protection and power conditioning. Another option is to route the A/V cable in-wall, and use a small wire raceway on the outside of your wall for the power cord.

Making sure you have enough wire

After planning where you're going to route your wire, calculate how much you'll need. Remember that it's better to have a bit too much than too little. Here's an example:

- running wire from the receiver to the wall: ..... 4 feet
- running wire horizontally inside wall: ..... 8 feet
- running wire vertically inside wall to TV location: ..... 4 feet
- running wire from wall to TV (with slack): ..... 3 feet
- subtotal: ..... 19 feet
- + 15% fudge factor: ..... **22 feet total**

Attaching the TV portion of the bracket

Wall mounts are generally composed of two pieces — one that you'll attach to the TV, and another that you'll mount to the wall. The portion on the TV then attaches to the piece on the wall, and voilà, you've got a wall-mounted TV. We've included the tips below as guidelines; only follow them if they don't conflict with the TV's or bracket's owner's manuals. Your first step will be to attach the TV portion of the mount to the back of your TV.

- Most flat-panel TVs don't have their mounting holes exposed — they'll be covered by a plastic cap. Just use a screwdriver to pry them off.
- Avoid lying the TV face down on the glass, since it can be permanently damaged. We recommend using the TV's pedestal to keep it upright. If you don't go this route, you can lean it up against a couch or table, using soft material (like a blanket) to protect the glass. If you do lay it on the floor, lay it on a soft blanket, and keep it well out of the way of foot traffic.
- The TV portion of the bracket often comes in two pieces. Make sure that you line up the screw holes on each side, so that the mount is level.
- If you're using a tilting or swiveling mount, make sure the screws attaching the mount to the TV won't impede the mount's movement. If they do, don't worry — wall mounts typically have multiple sets of screw holes to choose from, and you can simply use another set.

Like most flat-panel TVs, the one pictured above has four plastic caps over the holes used for wall-mounting. You can use a screwdriver to pry them off.

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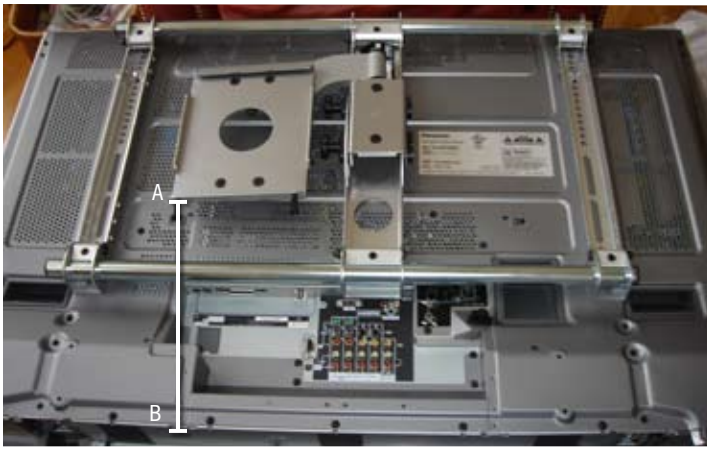


To figure out how high to mount the bracket: (1) Measure the distance from the bottom of the bracket (A) to the bottom of the panel (B). (2) Make a mark on the wall where you want the bottom of the TV to be. (3) Using your measurement from (1), mark the wall where the bottom of the bracket should be.

Measuring for your TV

Follow the steps below to figure out how high to mount your bracket on the wall. Also check the owner's manual for additional tips.

- Start by attaching the wall portion of the bracket to the TV portion of the bracket already on your TV.
- Next, measure the distance from the bottom of the panel to the bottom of the wall portion of the bracket. Since the bottom edge of the TV probably isn't on the same plane as the bracket, you can use a level to ensure you get an accurate measurement.
- Measure the height of your panel, and use a pencil or masking tape to mark this measurement on your wall. Make sure the middle of the TV screen will be at around seated eye level, and that the screen will cover up any power or A/V outlets you're planning to install behind your set. It might take a couple of tries to figure out exactly where you want your TV screen.
- Once you've figured out where the bottom of your screen should be, use your previous measurement to determine where the bottom of the bracket should be. Mark that spot.

Attaching the wall portion of the bracket

- To safely and securely mount your TV to the wall, you'll need to drill the bracket into wooden studs. After you've chosen your ideal TV mount location, use a high-quality stud finder to locate nearby studs. We recommend using one that can tell you where the exact center of each stud is, to ensure that your TV is securely mounted. Mark each stud with a pencil or masking tape.
- If your stud finder can't tell you where the center of the stud is, you'll need to figure it out manually. Once you've chosen which studs you're going to use, verify where each stud is located using an awl or thin nail. Hammer the nail into the wall partially until you hit the stud, then pull it out, move it about ¼" to the side, and repeat until you only hit drywall. Do the same in the other direction. Then, find the middle of the stud by measuring the distance between the two drywall-only holes. Mark it — you'll want to mount the bracket on that middle line.
- Verify that the mounting holes in the bracket line up with the center of the studs.
- If you'll route your cables inside the wall, trace one of the pre-made holes in the bracket and cut the hole for the cables to exit your wall. See pages 5-7 for details on in-wall wiring.

Many brackets have pre-existing holes for A/V cables. Trace the one that's closest to the A/V connectors on your TV. Drill a pilot hole, and explore the space behind the wall where you'd like to cut. Once you know that area is clear, cut the hole in one piece using a drywall saw.

- Always use a level to verify that the bracket is level before securing it to the wall. Follow the mounting directions in the owner's manual. Have your helper keep it stable while you screw it into the wall to make sure it stays level.
- Verify that the bracket is level before mounting the TV. It's much easier to make changes now than after the TV's on the wall.
- *Note: Brick, solid concrete, and concrete block mounting* — Not all brackets are mountable on concrete or brick, and only some will include the appropriate hardware. You may need to order additional materials from the manufacturer or purchase some supplies from your local hardware store, such as concrete wall anchors. Be sure to follow the instructions in the owner's manual.
- *Note: metal studs* — If your house has metal studs, you should not wall-mount your TV. Most metal studs are too weak to support that much weight.

Hanging the TV on the wall

- Do not attempt to do this part on your own. Ask your partner to help you lift the TV and line up the bracket. Have him/her keep it steady while you screw the bracket on the back of the TV onto the bracket on the wall.
- Before you fully secure the two bracket portions, check that your TV is level one more time. If your bracket allows for tilting or swiveling, now is a great time to make any minor adjustments.
- Finally, connect the A/V and power cables to your TV.

When you attach the bracket on the back of the TV to the bracket on the wall, have your partner help you lift the TV, line up the bracket, and keep it steady. If you have an adjustable bracket, use a level to position the screen.

Want to see some of these steps in action? Watch our video about wall-mounting a flat-panel TV at **crutchfield.com/wallmountvid**

Wall-mounting your flat-panel TV

Routing in-wall A/V cables

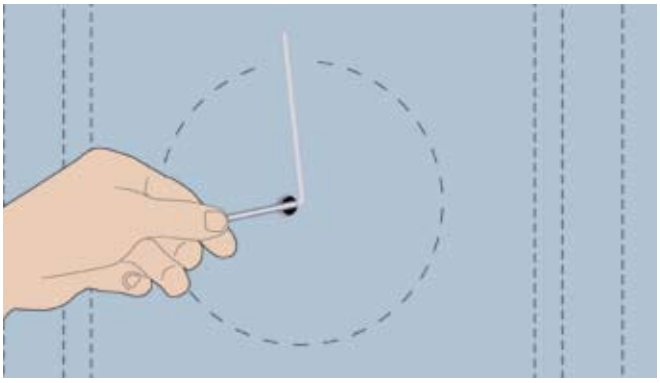
Running in-wall wire can be a difficult task, and in many cases will require drywall repair. Some parts are two-person jobs, so make sure you have someone else to work with.

If you're just doing a short vertical run, straight down from the TV and then out of the wall to your component rack, then you'll probably just have to cut two holes. If you're doing a longer run, moving horizontally through the wall, you'll have to cut additional sections so you can route the wire through the studs. Always remember to drill pilot holes to make sure you won't damage any electrical or plumbing lines.

The following tips offer general guidelines to keep in mind when routing audio/video cable through walls and ceilings. You can find complete details on concealing wire outside your walls and routing wire inside your walls in our wiring guide at **crutchfield.com/inwallwiring**

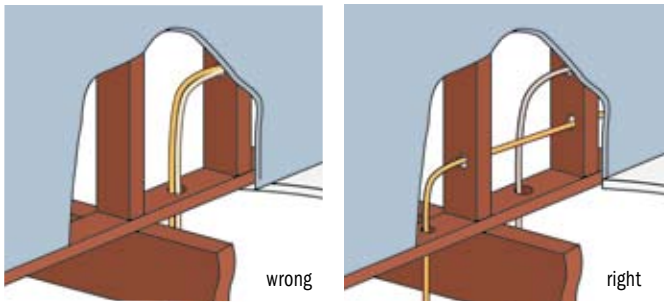
The rules

- When you're cutting holes for cables to enter and exit the wall, you'll want to start with a pilot hole. This is a small hole, drilled in the center of the space. Use caution when drilling pilot holes, so you don't plunge your bit into a pipe or electrical conduit. Then, insert a sturdy wire (such as a bent coat hanger) into the pilot hole, and explore the space behind the wall where you'd like to cut. You should also explore nearby crawlspaces or review your electrical and plumbing plans (available from your builder) to make sure you know what's behind the drywall before you cut. Don't cut unless you know that the area behind the wall is clear.



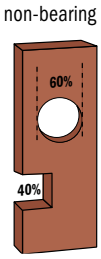
Use a sturdy wire (such as a bent coat hanger) to explore your pilot holes. Be sure that the space behind the wall is clear before cutting.

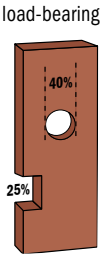
- When cutting drywall, use a hand-held drywall saw (not an electric one) and cut slowly. Cut the drywall in one piece, on an inward slant, so that it's easier to patch later if necessary.
- Use your stud finder to check for obstacles along your wire route, such as studs, joists, and fire blocks. Always inspect as much as possible without making a hole. Explore your crawlspace or ceiling in an unfinished segment of your basement. Try to detect which way joists run and where empty wall space between studs might be. By inspecting from your crawlspace or attic, you can identify which wall locations are empty of water pipes and electrical wires. However, you still can't know what's behind the wall with absolute certainty. You must be prepared to cut and patch exploratory holes.
- Don't run audio/video cables close to power cables — this can negatively affect the picture and sound. (You can find out where the power cables are in your home by exploring an unfinished attic, basement, etc. or possibly by obtaining a copy of the electrical plan from your builder.) Don't let A/V cables and AC power cable run parallel for more than 5 feet. If they do, keep them a *minimum* of 12 inches apart, but preferably at least 2-3 feet apart. If they cross paths, keep them at 90-degree angles.



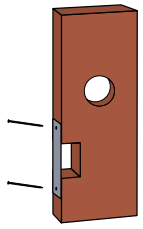
(A) Running A/V cables with power cable results in poor performance.
(B) For good performance: If A/V cable and power cable run parallel, keep them a minimum of 12" apart, 2-3 feet if possible. If they intersect, keep them at 90-degree angles.

- When drilling or notching studs:
  - For your wires to pull easily, the diameter of a hole should be about twice as big as the total diameter of all the wires you plan to pull through it. You may have to drill multiple holes to pass all your cables and still be up to code:
    - For studs in load-bearing walls, a hole cannot exceed 40 percent of the stud's width; a notch cannot exceed 25 percent of the stud's width.
    - For studs in non-bearing walls, a hole cannot exceed 60 percent of the stud's width; a notch cannot exceed 40 percent of the stud's width.
    - When in doubt, treat the stud as load-bearing.
    - For joists, a hole cannot exceed ⅓ of the joist's depth, and cannot be within 2" of the top or bottom edge. There can be no notches in the middle ⅓ of the joist, and a notch should not be larger than ⅛ of the depth of the joist.
  - If you notch a stud, use a nail plate to protect the wire.
  - If you're drilling or punching through steel studs or joists, drill in the middle of the beam, and use plastic grommets to protect the wire from the sharp edges.





In non-bearing walls (left), holes can't exceed 60% of the stud's width and notches can't exceed 40%. In a load-bearing wall (right), holes can't exceed 40% and notches can't exceed 25%.



Use nail plates if you notch studs, to prevent your cable from being damaged in the future.

- If you're pulling more than one cable through your wall to the TV, you can save time and effort by pulling your cables in a bundle. First, fish your tape through the run, without any cables attached to it. Next, tape your cables to the fish tape. Don't bunch all of the connectors together, but tape one behind the other to keep the bundle as narrow as possible. Then, pull the fish tape back through the run, this time with the cables attached. If you're routing the cables through studs or joists, make sure your holes don't exceed the limits listed before.
- Don't route your TV's power cable through the wall. Instead, you can run it on the outside of the wall, tacked to the wall or hidden behind a wire raceway, or hire a licensed electrician to install an AC outlet behind your TV.

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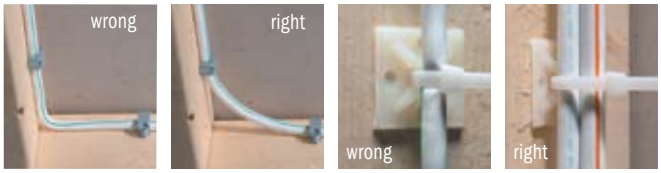
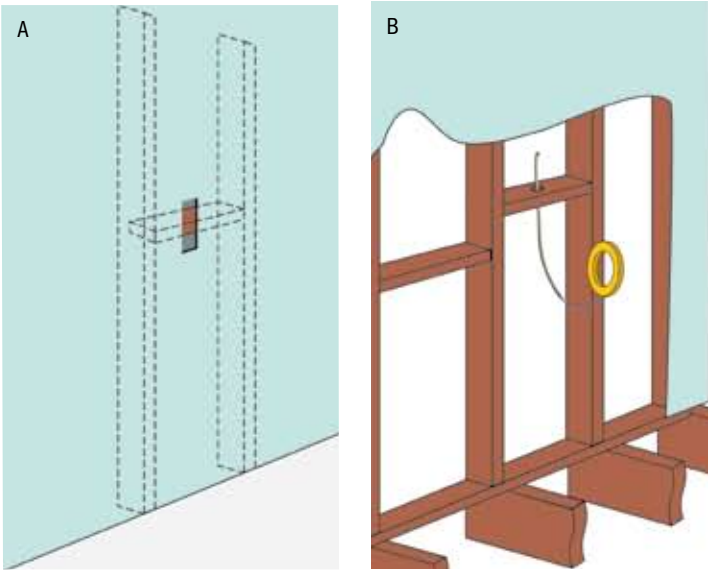


Don't bend the cable; instead, create a smooth, gradual curve.
Plastic wire ties should be snug, but not tight enough to pinch the cable.

- Keep the cable fairly taut, but don't pull it tight enough to create tension. Stretching the center conductor and/or dielectric can damage your wires and impair performance.
- Secure the cable with plastic wire ties approximately every 4-4.5 feet.
- Don't create any sharp bends in the cable, or tie it down too tightly, since this can pinch the cable and impair performance.
- Don't run it through holes occupied by other cables, unless they're also low-voltage wires, such as security or phone lines.
- You'll need to install an open-backed junction box ("J-box") or P-ring near your receiver. This is where the A/V cables will exit the wall. The J-box or P-ring will also need a face plate — either with a hole that allows the A/V cables to pass through the wall, or with connectors that link the in-wall cable to the out-of-wall cable.

A junction box or "J-box" provides a clean-looking and safe interface for your in-wall cable to exit your wall and run to your A/V system. J-boxes made for retrofit installation have rotating tabs that secure them to your drywall. If you're installing one to run wires to your receiver, mount it at the same height as AC outlets for a clean, uniform look.

- Before you run your cables, be sure to clearly label them on both ends. You can make your own labels using masking tape and a marker, or try our easy-to-read, self-adhesive, color-coded CableLabels.™ For more info, visit **crutchfield.com/CableLabels**



To route wire through a hidden obstruction: (A) Cut a rectangular piece of drywall around the obstacle. (B) Notch the block or drill a hole for the A/V cables. Use your fish tape to route the wire through the hole.

What if you can't avoid a hidden obstruction?

You might encounter some in-wall obstacles while routing your wire, such as additional bracing or a fire block. If that happens:

- Use your stud finder to estimate the position of the block behind the drywall.
- Drill small pilot holes and use a piece of "L" shaped wire to determine the dimensions of the block.
- Using your drywall saw, remove a rectangular piece of drywall around the obstacle. Cut on an inward slant so that it's easier to patch the drywall when you're done.
- Notch the block or drill a hole for the A/V cables. If you notch the block, don't forget to cover it with a nail plate.

Fishing cable through insulation

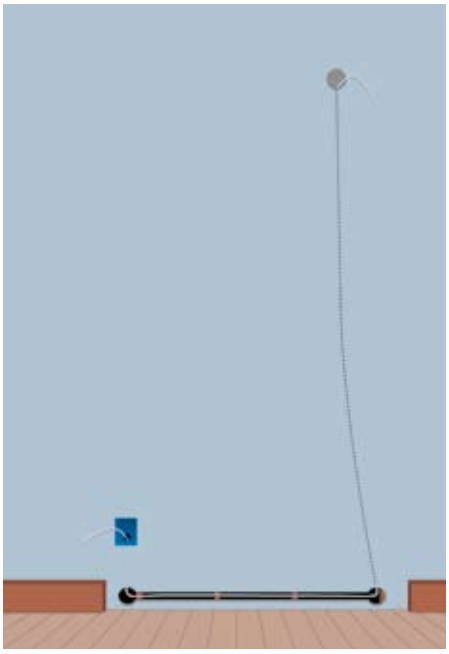
Insulation is most commonly found on exterior walls, but you might run into it when fishing wire through interior walls too. The key here is not to fish the wire through the insulation, but around it.

Many types of insulation will have a paper or plastic covering. Try to fish your wire between that covering and the drywall. Alternatively, fish the wire along a stud, using the stud as your guide. In this case, if you have fish tape that's wound on a spool, keep the tape curved in towards the surface of the stud, so that it's less likely to stray into the insulation.

You can also check your local hardware store for different kinds of fish tapes designed to be more effective with difficult runs like these. *Note: Wear gloves and protection for your mouth, nose, and eyes before handling insulation that contains fiberglass.*

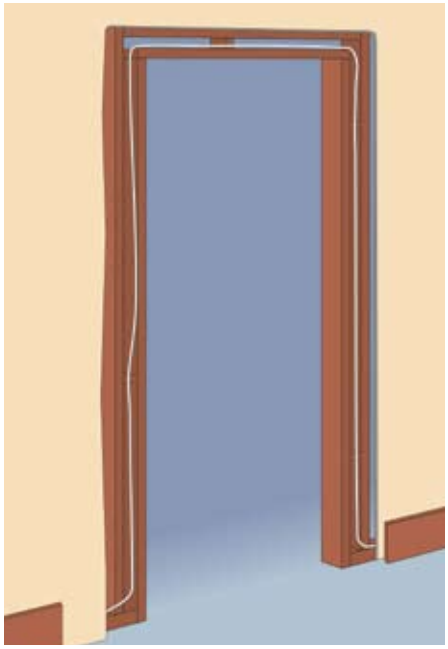
Wall-mounting your flat-panel TV

Additional wire routing tips



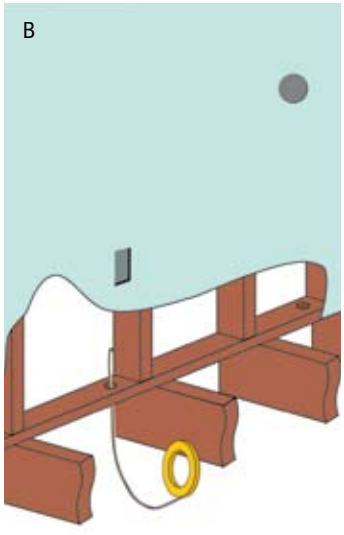
Routing wire horizontally along a baseboard

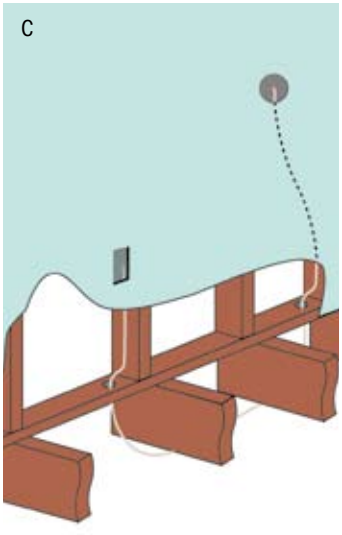
Carefully pry off the baseboard with a small crowbar. Cut the wire channel by scoring and chiseling the studs (be sure that the baseboard will conceal the channel). Fish your tape from one hole to the other and pull the wire through. Tuck the wire into the channel and install nail plates at each stud. Re-install the baseboard — no drywall patching required.



Routing wire around a door frame

Carefully pry the molding away from the doorway using a chisel, small crowbar, or putty knife. Run the cable between the frame and the jamb. (You might need to chisel out channels for the wire in the frame, so that it doesn't get pinched or compressed when you replace the molding.) Reattach the molding, being careful not to damage the wire.



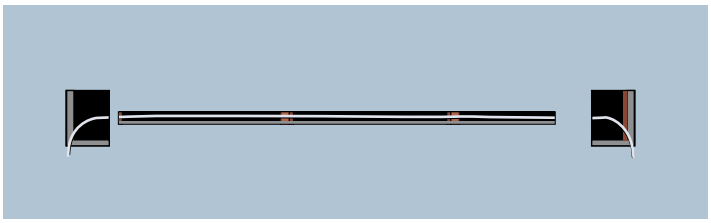


Routing wire through an unfinished basement

A. *Cut a hole for the cables to enter the wall, and one for your A/V cables to exit the wall and plug into your TV. Next, drill two holes in your basement ceiling to route the A/V cable. You can either measure the distance to the A/V cable holes from an adjoining wall, referencing a copy of your blueprints, or measure the distance from a visible landmark that runs straight through the wall to the floor below, such as a plumbing pipe.*

B. *Once you've drilled the holes, use a fish tape to pull the wire up to the exit hole where you want the cables to plug into your TV.*

C. *Next, fish the wire up to the TV location.*



Routing wire horizontally through the wall

If you're working with a relatively short wire run, cut the channel in one piece, using a utility knife. Ensure that the wire channel begins and ends at a stud. Drill holes in the stud with a spade bit. Pull the wire and patch, using the piece of drywall you cut out. For longer runs, cut a series of smaller wire channels, each beginning and ending at a stud.

Wall-mounting your flat-panel TV

Drywall repair and clean up tips

If your hole isn't very large (roughly 70 square inches), all you'll need is some drywall tape (paper or mesh — mesh is easier to work with), a putty knife, joint compound, and either a damp cloth or some sand paper (60-grain and 100-grain).

1. Place the piece back in the wall. Cut strips of tape, and apply them to each seam. If you're using paper tape, apply some joint compound to the seam, gently press the tape into it, and smooth it by firmly drawing a clean spackle knife across the compound and tape. Make sure there are no air bubbles. If you're using mesh tape, just apply the sticky side to the seam.
2. Apply thin layers of joint compound over the tape (probably 2-3), until you have a smooth, flush surface. Thin layers dry more quickly than thick layers, and will probably require less sanding later on since it's easier to keep them more flush with the wall.
3. Gently smooth the surface. You can do this with a damp cloth or with sand paper. If you use a damp cloth, make sure it's a smooth, non-textured material. Work in short spurts, then let the joint compound dry and observe your work. If you rub the compound with too much pressure or for too long, you'll have to reapply.

   If you use sandpaper, start off with 60-grain. Sand the compound until you can't see the lines from the putty or spackle knife any more. Next, use 100-grain to get a smoother finish. If you've got a lot of sanding to do, you might consider using a belt sander — but be careful that you don't sand off too much, or you'll have to reapply. Another labor-saving option is to use a sanding block. You can make one of these yourself: just take a strip of sand paper, wrap it around a piece of 2" x 4", staple the two ends of the paper together on the back side, and sand with the flat front side.
4. If you have primer, apply a coat before applying paint. Then paint the patch to match the rest of the wall.

If you need to cut a new piece of drywall to patch one or more of your holes, you'll need a utility knife, joint compound, and either a damp cloth or some sand paper (60-grain and 100-grain).

1. If this hole was cut on an inward slant, start by removing any excess material. If it's not a square or rectangular hole, remove material around it in a square or rectangular shape.
2. Trace the shape of the hole onto cardboard, or measure the length and width of the hole. Trace that shape onto a piece of drywall, then add a 2" border on each side.
3. Carefully score the drywall along the lines you just traced (inside the 2" border). Make sure you don't damage the paper on the other side — this paper will act as your drywall tape. Peel or chip away the drywall around the scored square, leaving the paper on the opposite side intact.
4. Apply a thick layer of joint compound to the area around the hole, as well as to the patch (on the side where you just scored and peeled the drywall). Use plenty of joint compound to avoid air bubbles.
5. Turn the patch around so that the intact paper is facing you, and place the remaining drywall rectangle into the hole. Smooth it by firmly drawing a clean spackle knife across the patch. This should be a close fit, but not too tight. If you need some extra room, just chip a little more drywall off of your patch, or expand your hole slightly. Let the compound dry overnight.
6. Smooth a thin layer of joint compound over the edges. You'll probably need 2-3 layers, or enough that the joint compound fully covers the seams and is smooth and flush with the wall.
7. Follow the sanding and finishing instructions above.

If you cut a large hole that will require additional backing to support your patch, or if you're patching a hole in the ceiling, you'll need some wooden slats (2" x 4"), drywall tape (paper or mesh), a putty knife, joint compound, and a damp cloth or some sand paper (60-grain and 100-grain).

1. Do you still have the drywall you had cut out before to use as a patch, or do you need to cut a new piece? See the previous two processes for instructions.
2. Cut a piece of 2" x 4", about 6-8" longer than the length across the hole (but short enough that you're still able to maneuver it inside the wall). If it's a very wide or tall hole, you might need to cut more than one piece.
3. Place the 2" x 4" in the hole. Secure it to the existing drywall using drywall screws. Drill the screws in enough to make a slight dent in the drywall paper, but not enough to tear surrounding material. These screws will be covered up later.
4. Place your patch of drywall in the hole, and secure it to the 2" x 4" with drywall screws.
5. Apply mesh or paper tape to all 4 seams (see previous instructions).
6. Using several (at least 2-3) thin coats of drywall compound, cover the tape and fill in the screw holes. Build up a smooth, flush surface, allowing each coat to dry completely.
7. Follow the sanding and finishing instructions above.

Additional tips

- Cover your floor, and any nearby electronic equipment or furniture before you begin — spilled joint compound and drywall dust can make quite a mess, and you don't want to have clean that up afterwards.
- Joint compound can dry quickly. Wash your tools as soon as you're finished with them, and dry them to prevent rusting.
- Sanding joint compound with sand paper (instead of using a damp cloth) creates lots of dust. While not harmful, it can be irritating to the eyes and sinuses. Some people might be more comfortable using protective eye, mouth, and nose gear.
- If you use a damp cloth to sand, work carefully and slowly so you don't remove all your work.
- Be patient. Joint compound may need to dry overnight before it's ready for another coat or for sanding.

