How To Install An Intercom Or Door Phone System For Your Home Or Business.

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If you decide you want to install a wired intercom or door phone system in your home or business, then this guide will help you do it. As long as you have a few tools and a basic understanding of how to use them, you should be able to install a system yourself (although having another person to help will ease the job significantly).

We'll cover the tools you need, plus go over basic building construction and ways you can run the wires.

You don't need to be an electrician to run low-voltage wiring like intercoms use. There is nothing dangerous about it, as long as you exercise care when using the tools you'll use.

Before we get into the details, let's get clear on the definitions used for intercom and door phone. When shopping for an intercom system you'll see both the terms door phone and intercom used. What's the difference between a door phone and an intercom? These terms are often used interchangeably, even in the same product description. For this guide, the term intercom will be used for systems inside a building that enable you to call from room to room.

A door phone is a system that enables you to receive "calls" from your front door or some other door on the outside of your building. When someone arrives at an outside door, they press a button that alerts one or multiple inside stations and then the people inside the building can talk to them by pressing a button on an inside station. Intercom systems may also have an outside intercom, or what we call a door phone.

New Construction

If you're building a new house or business, then strongly consider wiring it for a wired intercom system, even if you think you want to install a wireless intercom. Somewhere in the future your wireless system could receive interference that renders it ineffective or even useless. There will never be an opportunity to run wires as cheaply or easily as there is when a building is being constructed.

Think carefully think about how you will use the system. Try to consider where the most convenient place for stations will be. Will you be standing or sitting? Many hardwired systems are built in walls so for these you'll be standing. Many wireless systems and some wired systems have desktop units that allow you to be sitting.

Existing Construction

If you're planning on using a wired system for a pre-existing building, then considerable more work will be involved. Some 2-wire door phone systems claim you can just use existing door bell wiring. The problem with that is not on the door phone end of it, the problem is on the monitor side. Chances are your actual door bell is in a hall somewhere mounted near the ceiling.

If you don't want to stand on a ladder to use your door phone monitor, this obviously won't work for you. You could cut the door bell wires and connect a new wire to them, which would save you having to drill for the door phone. If you do use the doorbell wiring, you'll need to make sure you locate the power transformer for it and make sure it isn't still connected. Otherwise you could burn out your door phone.

If you don't want wires running on the surface of your walls where they are visible, then drilling and fishing the wires through the wall is required. This is not a task some people want to take on, but if you're a handyman, or handyperson, then maybe it will appeal to you. Otherwise you can hire an electrician or handyman to do it for you. Other people who could handle the job for you are heating/cooling contractors, telecommunications contractors, security system installers, and audio/visual equipment installers. Anyone who has experience in running low-voltage wires can do it.

But with a few skills we will teach you here, you can take on this project yourself.

Tools You'll Need And How To Use Them

Running wires through your walls will likely require a few low cost tools you may not have. These are all basic tools you can buy from any Home Depot or building supply store, or borrow them from a friend.

First, you'll need a drill. You don't need an expensive drill. The drill needs enough power to drill though a 2x4 and a ¾ inch layer of plywood without bogging down. If you're running wires from an attic space, the drill will have to be able to drill through 3 inches since there are two 2x4s on top of each wall.

At least that's the way it is in newer construction. Older homes only have one, but the wood has probably become hard so drilling through it will likely be about the same for the drill. If you don't use a heavy duty drill, you'll want to let it cool down during usage because they can get very hot if you have a lot of holes to drill.

Next you'll need to purchase a wood boring drill bit that's $^{5}/_{8}$ to ¾ inch in diameter such as the ones shown. The spiral-like auger bit shown is the best type, but they can be a little expensive. The flat bit shown will do the job and if you'll just be doing a few holes, you may as well keep it cheap and buy the flat bit.

Once you have the holes drilled, now you'll need a way to get the wires run through them. If there is no insulation in the walls, you could just drop down a string with a weight attached, tape the wire to it, and then pull it up. Inside walls have no insulation, but exterior walls do (unless you have an older house in a warm area).

You can't drop a string through a wall that has insulation in it. If you are installing a door phone it will obviously be on an exterior wall. That means you need something stiff to force your way through the insulation. That's where the fish-tape like the one shown in red comes in handy.

A fish tape is a tool used by electricians to route new wiring through walls. A fish tape is a roll of highly durable tempered 1/8" wide spring steel that can be "fished" (guided) through the confined spaces within wall cavities.

Once the fish tape is pushed through the hole you drilled, the intercom wire is attached to the fish tape and then pulled through the wall. There is a loop at the end of the fish tape you can push the intercom wire though, and then you want to use duct or electrical tape to securely fasten the wire to the fish tape. Nothing is more frustrating than pulling the fish tape through the wall only to find the wire has fallen off.

Fish tapes have a natural curvature which helps guide the tape. You can manipulate the reel part of the fish tape to move the end to where you want it to be. This is where having a friend on the other end can really help. While you're pushing the tape through the hole, your friend can be feeling for it and grab it once he does. In a minute you'll see where your friend or you will be pulling the fish tape to.

Using a fish tape is much easier in an un-insulated wall. If the wall cavity is filled with thermal insulation, it becomes much more difficult, but you can always find that tape in the wall somewhere. If your friend has his hand in the wall he or she can feel for movement and then grab the tape before you push it way past where you want it.

If the building you want to install the wired intercom system in has the sprayed in foam insulation, you better go with a wireless system because you won't likely be able to push the fish tape through the wall.

There is one other tool you can buy or not, but you will need some way to cut a small hole in the drywall. The drywall saw shown is one way to do this. You could also use a heavy serrated kitchen knife or even a utility knife. The drywall saw produces a nice clean cut though.

The reason you have to cut a hole in the drywall is not to run the wire through, but to get your hand inside the wall to grab the fish tape. The chances of guiding the fish tape through a little hole are almost zero.

So what we do is cut a hole the size of a standard electrical outlet box, which is about 3 ½" x 2". That's big enough to get your hand through. Then when you are done running the wire, you have three choices for the hole:

1. Patch it using drywall repair techniques
2. Install a standard retrofit electrical outlet box and cover it with a blank faceplate
3. Install the intercom station over the hole to cover it up

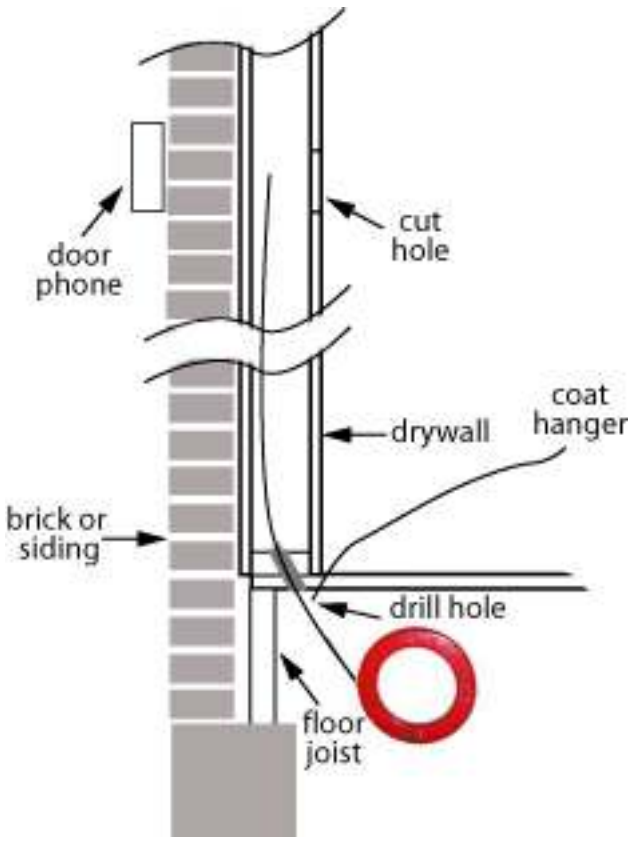
Of course the last two are the easiest. You can go to any building supply store and purchase an electrical box that has little flip up tabs that tighten against the back side of the wall. Then when you cover it up with a faceplate that has no holes (except for the two screw holes) it looks like it is there for some future expansion. You should always try to line it up with the other light switch or electrical outlets so it doesn't look out of place.

If you choose to install the intercom station over the hole you want to make sure the hole is right next to a wall stud. That way you have something to mount the intercom station to. To use this method, you'll need to make sure the intercom station is wide enough to mount to the center of the stud, and still cover the hole you cut.

Some intercom monitors/stations are built into the wall so you'll already need to cut a hole for these. Or you may be able to mount the station directly to the retrofit electrical box you installed.

Running The Wires

Before you start drilling and cutting you have a decision to make. There are two ways you can run the wire: through the attic, or through the basement or crawlspace. If your house or business is sitting on a cement slab, you're obviously going to have to go through the attic or above the ceiling tiles in a business.



The two diagrams below give you detail on how the wiring will be done. The diagram with the bricks is an outside wall, but an inside wall uses the same techniques.

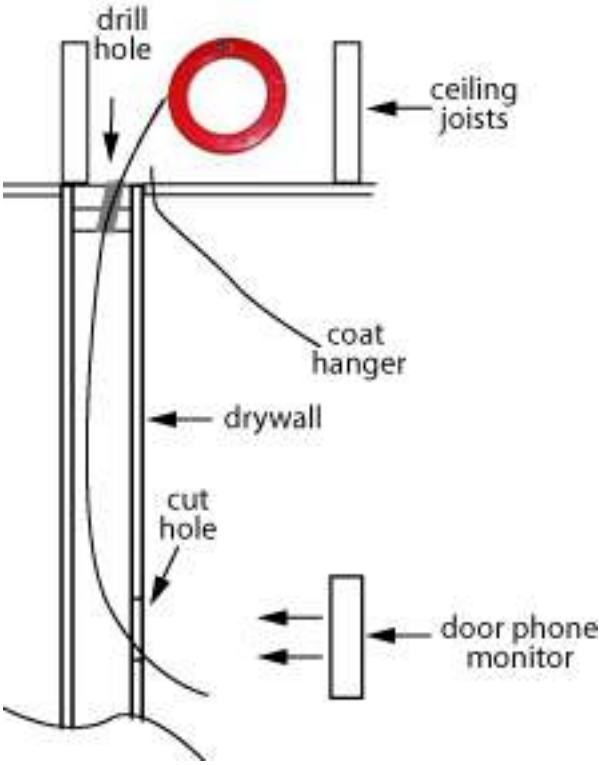
One thing you'll notice in the two diagrams is a cut up and straightened coat hanger. The sole purpose of the coat hanger is to help you identify where you want to drill the hole for the intercom wire. When you're crawling through an attic or crawlspace it's hard to figure out where you need to drill…and you don't want to drill through the middle of the

floor or ceiling.

So once you locate where you want to install the stations, you either drill a small hole the size of the coat hanger through the floor or through the ceiling (you can actually just punch the coat hanger right through the ceiling if you push it with a pliers). You want the coat hanger to be directly above or below where you want the station to be so it will be easier to guide the fish tape to the desired destination.

If you're going through the ceiling, put the coat hanger through close near where the wall meets the ceiling. When you remove the coat hanger later you'll just put a little dab of spackling compound to fill the tiny hole (or even white toothpaste).

If you're going though the floor, drill the coat hanger hole right under the baseboard or as close to it as you can. If the room is carpeted, you don't have to worry about repairing the hole. If you have hardwood, just a little dab of the same color wood filler will make the hole nearly invisible. Sometimes you won't even need to do that and you still won't see it.



So you insert the coat hanger through the hole about a foot and then go into the attic or crawlspace to find it. Once you find it, you'll probably see some nails sticking through the floor to show you where the wall you're about to drill through is located.

Now you simply take your drill with the wood boring bit and drill about 2 inches from the coat hanger towards the wall and you'll be right inside the wall. Simple as that!

Now you get your fish tape out, push it into the wall, tape it securely to the fish tape, pull it through the wall, and then you're ready to follow the installation instructions that came with the door phone or intercom system. You'll also need some sort of wire strippers to prepare the wires to connect to the terminals on the intercom. You can use a knife, but this is not the preferred method as a kicked wire will sometimes break when bent.

If you're installing an outside door phone to a brick building, you'll also need a concrete drill bit that can go the depth of a 3 ½ inch brick plus at least ½ inch of whatever they used behind the brick. A 4 ½" long ¼" diameter drill bit should do the trick (there is still some shank left to go in the drill so the actual bit should be longer).

You don't drill through the brick itself. You want the wire to come out a mortar joint which is much easier to drill through. You'll also need some screw anchors that go in a ¼" hole so you can mount the door phone to the brick.

So while running the wires for an intercom system can be a dirty job, it's not extremely difficult once you know the little secrets you've just learned.

There's nothing like the feeling of accomplishment you get from doing a project like this yourself. In fact, once you do it you may want to take on even more low-voltage wiring projects around the house!

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