

As Seen In

ELECTRONICHOUSE



SANTA FABIO

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Build the Home Theater of your Dreams

What is home theater? It's more than something you buy in a box. It's more than a collection of speakers, a big-screen and a DVD player. It's more than a bunch of wires that hook up to some thingamajigie. The true meaning of home theater actually has little to do with the DVD player, the speakers or the

perfect placement of the big-screen. A home theater is you and your honey watching a movie on a quiet night. It's a small child cuddling with you while you watch her favorite Disney flick. It's your teenagers playing games with their buddies. It's you and your friends gathered for the big game. Simply put, the true meaning of home theater is what you want it to be.

Design Your Room

Most professional home theater designers agree that it's the layout of the equipment that impacts the overall performance of a home theater more than the actual quality of the equipment itself. In other words, you can spend top dollar on speakers and a display, but if the products are positioned poorly, they'll sound and look no better than something you could have picked up at a neighborhood yard sale. If you're going to make the investment in a great home theater system, be sure that you take the time to lay it out correctly. While there are no hard and fast rules when it comes to placing big-screen TVs and surround-sound speakers, there are some general guidelines that you should try to follow when designing your home theater space.

The Screen

As the anchor of a home theater, the screen, be it a 27-inch TV or a 110-inch projection screen, dictates the location of the speakers and the furniture. The size and shape of the display will determine how far back your seats should go for the best view of the action. Once the furniture is laid out, you'll be able to settle on a spot for the rear surround-sound speakers.

There are several factors that will designate the proper distance between the screen and seats: the size of the screen, the type of screen, the size and shape of the room and your viewing preferences.

Screen Layouts

In general, the larger the screen, the farther back the seats should go. Why? The pixels that make

up a picture are usually more noticeable on larger screens, and the closer you sit, the more pixelated the images will appear. Sit back a few feet, and those pixels will become less noticeable, resulting in a picture that's clearer and smoother.

Many professional home theater designers suggest scooting the seats back two and a half to three times the diagonal screen measure-



Twinkling fiber optic lighting on the ceiling can make an exciting space for entertaining family and friends.

ment. So if your display measures 40 inches diagonally, the best position for the main viewing seats would be between 8 feet and 10 feet away from the screen. Using this formula as a general guideline, that 100-inch screen you've been pining for might not be the right choice if your room measures just 15 feet from front to back. You'll need a room that's at least 20 feet

long to comfortably view a display that large.

This doesn't mean that you can't enjoy a screen that's big for a room, though. Sitting a tad closer than the recommended seating distance works if you're the type of person who prefers to sit in the front row of a movie theater or you plan to watch movies and TV programs mainly in high def. A new generation of 1080p (the highest high-def available) projectors and big-screen TVs effectively erases the visible lines inherent in lower-res pictures produced by standard analog TVs and earlier generations of high-def displays. That means you can get closer to the screen and still enjoy a crisp, clear picture.

Furniture Layouts

A comfortable seating distance requires the right room orientation. Your TV, seats and speakers should be laid out to take advantage of the length of the room. For example, if the room measures 20 feet by 17 feet, position the screen on the shortest wall, ideally in the center. Of course, this area is also a popular spot for fireplaces, large windows and other architectural elements, so you might have to resort to placing the TV in the corner, which isn't a

bad idea if you'd like the fireplace or arched windows to remain the room's focal point. However, if you're dealing with a massive stand-alone screen, corner positioning might be impossible. In that case, you might need to reorient the room widthwise. The arrangement can work; you'll just have less space between the seats and screen to play with.

Speaker Layouts

As a rule of thumb, in a 5.1 setup (five speakers and one subwoofer), the front left, center and right speakers should be placed at the front wall with the screen, and the back left and the back right units should go on the side wall slightly behind the main home theater seats. Ideally, each speaker should be angled slightly toward the seats. The front speakers should sit at ear level (when you're seated), and the back speakers should sit slightly above

FUTURE-READY CLUES

- An abundance of audio/video inputs usually signifies a product that's prepared for the future.
- Upgrade programs offered by some manufacturers ensure that even as new processing technologies are introduced, their equipment can be easily upgraded with a simple software modification.
- Products specifically designed with home control in mind offer users the unique ability to integrate the operation of A/V products with other electronic systems in the house. Look for RS-232 ports on the backs of equipment.
- HDMI (High Definition Multimedia Interface) protocol indicates that a component can carry multi-channel audio, HD video and inter-component control on a single cable.



ROO WAY
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ear level. If the screen takes up most of the front wall, you may have no choice but to plant the center-channel speaker below the screen and the right and left speakers on the side walls. Also, depending on the room's design and architecture, the surrounds may need to be mounted directly behind the couch. And in some cases, like in a great room that has only one side wall, the best option may be to mount the speakers to the ceiling. As long as your speakers are in the vicinity of where they should be, your home theater designer can use equalizers and pivoting mechanisms to tweak the units to create the realistic, engaging surround-sound effects your theater deserves.

Nothing's Perfect

Unless you're able to build a home theater from scratch, expect to make compromises and sacrifices when positioning the speakers, screen and furniture. Often, the best locations for the components clash with the interior design, or there's something structural about the room that limits placement options. Sometimes comfort must prevail over the rules of the room layout, so if you want to keep the couch where it is, that's okay. As long

Freestanding speakers and sleek shelving can add a unique design element to your space.

as the movies look and sound good to you, your theater doesn't have to be perfect.

The Equipment In the Rack

A surround-sound receiver—also known as a home theater receiver, audio/video receiver, surround preamplifier or audio/video preamplifier—is the brains of the system. It takes in the audio signals and processes them before they reach the speakers. A receiver or preamplifier contains the amplifiers for all your speakers, so you won't need to purchase separate amplifiers. A receiver differs from a preamp by also having a radio receiver. Be sure a receiver or preamp is capable of playing in Dolby Digital or DTS Digital 5.1-channel surround sound (meaning five speakers and a subwoofer), or whatever soundtracks you want to hear.

DVD players provide audio as well as video. Audio will go from the DVD player to the receiver or the processor. A DVD player can also play CDs, and many "universal" players can also play multichannel DVD-Audio

(DVD-A), Super Audio CD (SACD) and every kind of CD- and DVD-R/RW/ROM you can find. Universal players are a great buy, and many have really come down in price. Also be sure to get a progressive-scan DVD player if have an HDTV. There are new high-definition DVD players than can play audio discs as well.

Surround-sound processors are used when you want to have a separate processor and amplifiers. These are primarily employed in high-end systems. The thinking is that a system that does one thing, such as signal processing or amplification, can do it much better than a component that does multiple things, as a receiver does. It's also much more costly. If you're getting a receiver or preamp, you won't need this.

Amplifiers are used with surround-sound processors in what are called "separates" systems. One multichannel amp can support several speakers, or separate "monoblock" amps can be used for each channel. These are sometimes used to power big subwoofers for loads of bass in high-end home theaters. Again, if you're going the receiver or preamplifier route, you won't need one of these.

Audio cables are used to connect your

components, and there are some important rules of thumb. First, get good cables; don't use the cheap ones that come in the box. You can connect a DVD player to a receiver or processor via analog cables—or even better, digital optical cables. If you can, get components with HDMI (high-definition multimedia interface) connections that combine digital audio and video in one wire and have the necessary copy-protection technology. The speaker cables that connect your receiver/preamp or amplifier(s) to your speakers should be 14-gauge or lower (the lower the better).

In the Room

Speakers are where the sound meets your ears, so don't scrimp on them. Your home theater system will only be as good as its speakers. And there are many different kinds to choose from. There are freestanding or floor-standing speakers, in-wall and in-ceiling speakers, on-wall speakers and bookshelf speakers.

Most speakers usually come as either two-way or three-way models. Two-way means they have a woofer for the low sounds and a tweeter for the high sounds. Three-way speakers have a woofer, tweeter and midrange driver (for those middle-of-the-scale sounds). And don't think a three-way speaker is necessarily better than a comparably priced two-way speaker. Think about the cost per driver in each: The two-way speaker probably has better a woofer and tweeter than the three-way model.

Some speakers don't even use the traditional round speaker drivers most of us recognize. Electrostatic and ribbon (or planar) speakers work by exciting thin membranes to produce very smooth sounds. These types of speakers produce great sounds for jazz and classical music, and are often used in conjunction with traditional woofers to produce the low sounds. These are called hybrid speakers.

But don't let looks and specifications determine which speakers are right for you. In the world of speakers, hearing is believing. Audition the speakers. Play tracks that you're very familiar with so you can judge the speakers' performance. And go with the ones that sound best to you—not to the guy selling them.

Freestanding, floorstanding, cabinet or box speakers are different terms for those



boxy speakers most of us grew up with and later tried converting to giant plant stands. Then we got married and our partners made us get rid of them. But guess what? Today those ugly old speakers are making a comeback as beautiful, sometimes sculptural “tower” speakers, with different finishes to complement your decor. And they're still the best speakers for reproducing audio, because the woofers and other drivers tend to be bigger.

In-wall and in-ceiling speakers fit into wall and ceiling cavities, have innocuous grilles that fit flush with the surface and can be painted to blend in. They are also known as architectural speakers. In-wall units tend to be rectangular, while in-ceiling units are circular to complement lighting fixtures. Some in-wall speakers are actually placed behind a thin coat of plaster, and some in-ceiling speakers look just like drop-ceiling tiles. Because in-wall and in-ceiling speakers are made only a few inches deep to fit into wall and ceiling cavities, there is a performance compromise. However, technological advances have made these speakers acceptable alternatives for home theater. Many of them even have rotating or pivoting drivers so the

A media server can hold all your entertainment content—DVD's, CDs and digital photography—all on one machine.

sound can be directed toward the listening area.

On-wall speakers are a newer breed of thin speakers that can be placed on the wall, often to complement a flat-panel plasma or LCD screen. Like in-wall speakers, the thinness of the drivers can limit their sound quality. Some can even be made to look like art by having designs printed on their fabric grilles. You can also mount small speakers to the walls with brackets.

Bookshelf speakers are so named because they can fit on shelves. They may be smaller than freestanding or cabinet-styles speakers, but they can sound great, and they're wonderful for fitting into credenzas, cabinets and above kitchen cabinets. Many also come with decorative floor stands.

Video Displays

There are four types of video displays available today and several different technologies to choose from. Don't worry about understanding the techy stuff. The important thing

to know is what each display can do for you. Remember that screen sizes are measured diagonally. Always get the dimensions of the entire video display chassis to make sure it fits in your space.

Direct-view monitors are those traditional, boxy TVs we know and have come to hate. They're just so big! And if you want a picture larger than 30 inches, then you have to enter the weightlifter class to move one into place. They're so big because they use a giant cathode ray tube (CRT) to project a picture. And you generally won't find any of these in screen sizes exceeding 40 inches. Their small screens and big cabinets are the downsides.

The upsides are affordability and a great picture that can be viewed with the lights on. To many experts, CRT still provides the smoothest and most filmlike image. And that's what you get in one of these TVs or video monitors. They're available in widescreen HDTV and standard DTV (digital television). Some are even still available in the squarish, traditional TV screen format. But definitely buy a digital set, as those will be standard in the next few years. You can get a direct-view HDTV for under \$1,000 today. Direct-view TVs are great to have in family or living rooms where there is light from windows or lamps. They're also good for bedrooms, kids' rooms and exercise rooms if there's space. Smaller units can even be put in kitchens or mounted outdoors. If your goal is a modest home theater, this is the way to go.

Rear-projection sets are bigger than direct-view TVs. They used to come only in huge CRT models that were a couple of feet deep, weighed several hundred pounds and required a crew to move. These sets, if you can find one today, still provide a great picture up to 70 inches in size and can be viewed in lighted rooms. They use three CRT "guns" placed behind the screen to paint a smooth image. They can be some of the best buys in big-screen HDTVs.

Lighter and less-bulky rear-projection sets use DLP (digital light processing), 3LCD (an improvement on liquid crystal displays), and LCoS (liquid crystal on silicon). All these digital rear-projection sets are also known as "microdisplays."

DLP reflects light off of millions of mirrors on a computer chip to create a bright image that can be viewed in a well-lit room. Some people see artifacts and unpleasant effects from this technology, though it has improved greatly in the past couple of years. DLP sets tend to be affordable—about a step up in cost from CRT sets—and the picture is good enough for most people. 3LCD uses three liquid crystal panels to overcome some of the problems associated with LCD projection. LCoS reflects light off a liquid crystal chip to produce high-contrast and smooth images that are only now reaching their potential. Different flavors of LCoS include D-ILA and HD-ILA (direct-image light amplifier) and SXRD (Silicon X-tal [Crystal] Reflective Display). Some experts believe LCoS displays provide the best images of the digital display technologies.

Rear-projection sets are best for recreation rooms, playrooms and family rooms where there is enough space for them.

Front-projection systems shine images onto a screen and usually hang from a ceiling in a dedicated home theater space. If you want a really big picture of 90 inches or more, this is the way to go. These systems range from CRT projectors that use three "guns" and are very big and heavy to portable and more affordable DLP projectors. There are LCD and LCoS projectors as well. They all work on the same principals described earlier, only DLP projectors can have one chip or three (as used in some higher-end units). The thing to remember about front-projection systems is that you generally need a dark room to see the best picture. Light from windows will wash out images from nearly all but the brightest projectors, which most of us can't afford.

Some higher-end home theaters use front projectors in customized rear-projection configurations. This is done by placing the projector and a special mirror behind the wall and using a rear-projection screen. This makes it possible to watch video with some light in the room and saves you from hanging a projector on the ceiling. But you can only do this if you have a few feet to spare behind the screen.

Front-projection screens come in many

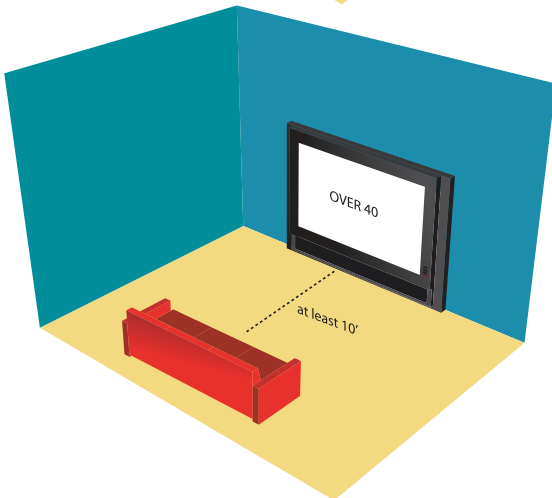
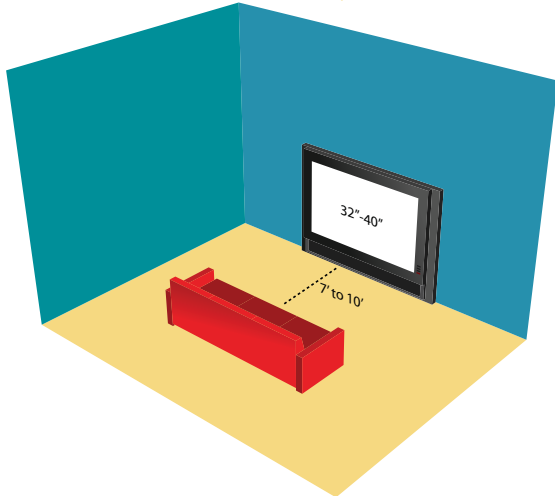
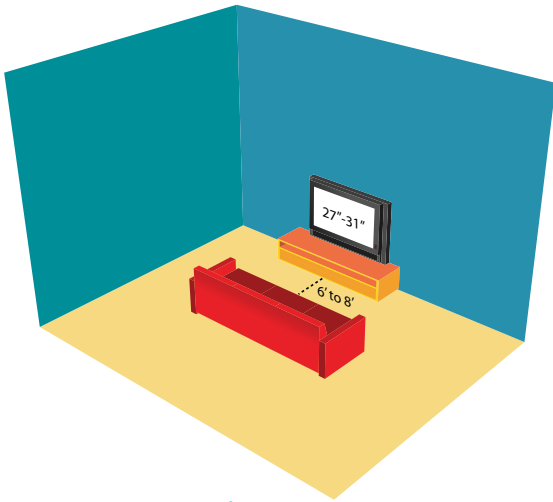
different sizes and shapes and shouldn't be an afterthought. Screens with higher "gains" reflect more light and will show brighter images. A gain of 1.2 is usually considered good for home theater. Some "gray screens" and even "black screens" are specially designed to work with DLP and LCD projectors. Some screens are fixed in place, and some of those are "acoustically transparent," which means they contain many tiny holes to allow speakers concealed behind the screen to sound through. Fabric screens are acoustically transparent as well.

Other screens can be rolled down from hiding spots in the ceiling, crown molding, a cabinet or a soffit. They can also be motorized. Some screens even come with blackout fabrics that roll down on the sides to change the screen shape, or aspect ratio, for watching widescreen movies without those annoying black bars. Check with an electronics professional about which screen is best for your home theater, and don't scrimp. A good projection screen can cost several thousand dollars.

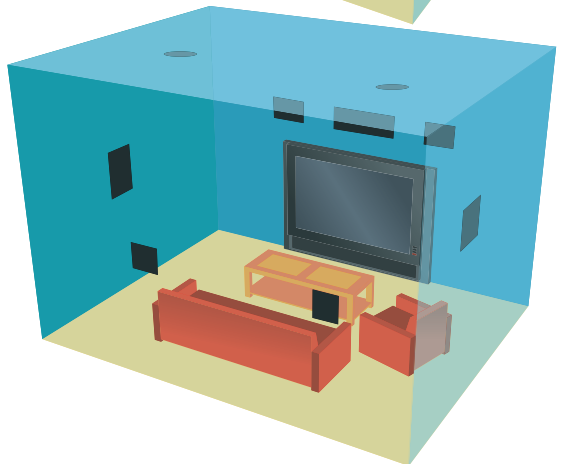
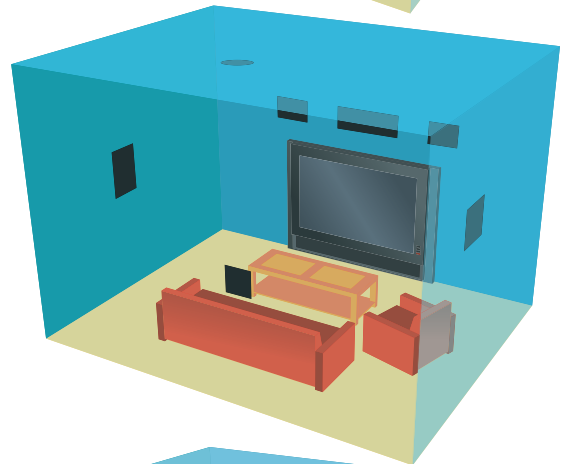
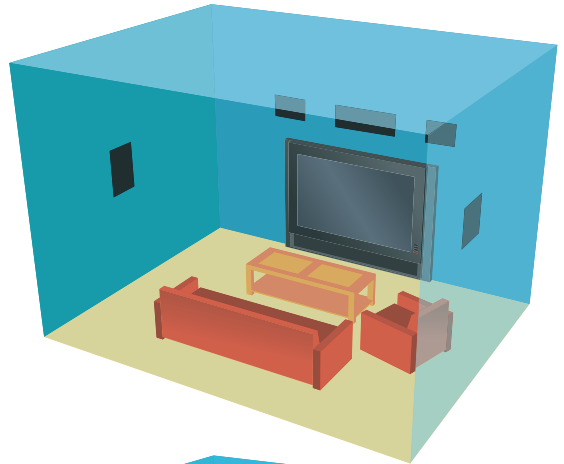
Flat-panel displays include plasma and LCD screens. We believe you know about some of these. They're only a few inches thick and can save you a lot of space when you hang them on a wall. Just keep in mind that wires will have to be run—they don't show that on the TV commercials—and once you mount the unit on a bracket or an articulating arm, it can stick out from the wall far more than a few inches. Many people place larger flat-panel displays on audio/video stands or credenza-style furniture pieces.

Plasma screens have been the rage, and can be as big as 70 inches, though most have screens of 42 or 50 inches. They work by little cells of plasma gas being excited, and they provide a bright image. They are useful in family rooms, bedrooms, outdoor spaces (if shaded from the sun's glare) and anywhere else you can think to put one. LCD screens are now competing with plasma in screen size, with some units of 50 inches or more, and in price levels for 42-inch models. LCD technology has improved greatly, but watch for motion blurring in less-expensive sets. Smaller LCDs of 10, 15 or 20 inches are perfect for kitchens, offices, outdoor areas and bathrooms.

The distance between the screen and the main viewing seat should be between two and a half to three times the diagonal screen measurement.



Speaker placement is critical to achieving an enveloping, realistic surround-sound effect. A 5.1 setup includes three speakers at the front of the room and two at the sides. A 6.1 setup has an additional speaker at the back, and a 7.1 arrangement features an additional two speakers at the back.



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