

# Planning A Residential Structured Cabling System

Until recently, one of the most overlooked aspects of home design has been low-voltage cabling. Since the 1960's, such cabling has mostly consisted of a few telephone jacks and a TV outlet or two, wired point-to-point and scattered through the home wherever the general contractor thought necessary. While adequate in its time, this way of wiring is just too rigid and limiting for today's home. With the rapid advances in technology, the quality of the cabling you install as you build will dramatically affect daily life in your new home. To answer the needs of new technology, the concept of Structured Cabling has evolved.

## ***What's different about a structured cabling system?***

The principle of Structured Cabling is "Wire It Right, Wire It Once" and this all hinges on one word... *planning*. In it's simplest form, Structured Cabling is a system of installing cables for the various low-voltage systems (telephone, computer, video, audio, etc.) with an eye to flexibility and change. All wiring is terminated in one location on special modules that make reconfiguration both fast and easy.

Having all these systems available in one network center introduces the potential for interconnection, creates a powerful synergy between the systems, and opens up some amazing possibilities. All this sounds wonderful, of course, but a crucial part of realizing this potential is careful planning both before *and* during the construction of your home. If it's done right, Structured Cabling can avoid costly changes and additions throughout the life of the home, add flexibility and convenience for the homeowner, and increase the resale value of the property.

## ***What exactly can a structured cabling system do for you?***

You'll be surprised! Consider the following:

- Structured Cabling can support multiple telephone lines and manage their flexible appearance in various locations. Life always brings changes. Whether you need to add a line for a home office, a teenager, or even for an aging parent, you'll have the ability to adapt easily.
- Structured Cabling can network your computers and let you reconfigure the network whenever you need. You can share your Internet access, files and peripherals, making your home network less expensive and more powerful at the same time
- Structured Cabling can network your video and audio devices. Not only can you distribute the public channels provided by your cable or satellite

provider but you can also inject your own internal signals. You can selectively watch DVDs, cameras or gaming from any in the house, creating a true Home Theater environment.

- Structured Cabling will let you create a whole-house intercom system so that you can monitor the baby's room, answer the door, or find a family member... all from any room of the house.
- Structured Cabling will let you place cameras at strategic locations both inside and outside your home, able to be monitored from any television in the home or even remotely through your Internet connection. Not only is this a wonderful security measure while you're home but, also, consider the peace of mind you'll have, being able to log in and monitor your home in real time from hundreds or thousands of miles away.

### ***Do I really need that much hardwire cabling in my new home?***

Many people think that "wireless is the way to go" and, for some purposes, this is true. The missing element with wireless, though, is interconnection. Properly designed, a structured cabling installation allows your different systems to work together and making even wireless communication easier to implement when it's most appropriate. The fact is that wired connections are still, and will continue to be, the faster, clearer, and more dependable way to go. As VoIP (Voice over Internet Protocol) becomes more practical for the residential and home-office environment, bandwidth and quality of service issues will become even more crucial. The best way to prepare to meet these demands is through dedicated hardwire connections.

### ***How is a Structured Cabling system created?***

Creating a Structured Cabling system involves a number of resources. Many different manufacturers offer a line of integrated hardware. Your communications consultant can show you the possibilities offered by Structured Cabling and guide the process of design and implementation. Your architect and your builder can give valuable advice and suggestions.

The most important resource in the design process, however, is the homeowner. Only you can answer these most crucial design questions:

- What do I want?
- Where do I want it?
- How might these answers change over time?

### ***Begin by putting it on paper.***

Start with a clean copy of the floor plan of your new home. Based on the planned use for each room, start by marking (in pencil) all the places where you can imagine needing any of these items (include a simple legend code as shown):

- T - Telephones
- C - Computers
- TV - Televisions
- HEC - Home entertainment center
- S - Speakers for whole-house audio
- I - Intercom stations
- D - Exterior door boxes
- C - Security cameras
- NID - Telephone service access (from local phone company)
- MP - Main panel location (usually requires 32"Wx42"H wall space near electrical panel and dedicated 110vac, 15amp circuit)

Once you've got your layout, think about the things you'd like to do with these systems. Try to express these ideas in terms of where, when, and who. Leave the "how" for later discussion with your communications consultant.

### ***Be imaginative at this point.***

You can always delete locations, choose to wire but not equip some locations or even delete whole systems as your planning or budgeting processes unfold, but now is the time to be creative. Remember that your design will need to support not only your current lifestyle but also whatever changes you foresee while you live in this home. Remember that good planning can also add resale value to your home, so have an open mind about how others might choose to utilize these spaces.

### ***Consult with a professional.***

Once you have your floor plan marked up, it's time to meet with your communications consultant. Show him your plan and explain the things you're hoping to accomplish with the systems you've described. He may suggest other options and he can also point out the difficult or expensive aspects of your plan.

Structured cabling system hardware is offered by many different manufacturers in a range of features vs. cost. Because there is no industry-wide standardization, it's best to source all your system hardware and appliances from a single manufacturer. This avoids incompatibilities and preserves the manufacturer's warranty on the equipment. Your consultant can recommend the most appropriate system for your applications.

Ask for flexible pricing. Most consultants will offer their pricing as a lump sum to include cable installation, materials, hardware and equipment, and terminations. Be sure to ask for specific line-item pricing for additions and deletions. This can cut down on disagreements as the project goes on but keep in mind that some

devices terminate multiple runs so it may not always be as simple as adding and subtracting.

Some consultants may be willing to provide you with system designs and let you provide some or all materials and labor yourself or through your builder. Ask up front if he is willing to work with you in such a way and to supervise the cabling process. Keep in mind, though, that the consultant serves a crucial purpose in implementing your structured cabling system and deserves to be compensated for his services. Be prepared to pay him for appropriate design and supervision services.

### ***Minimum design considerations***

Even if you're trying to economize as much as possible, be sure to put your cabling meets these minimums:

- Install cables to as many locations as you can afford, in any places they may be needed, either now or in the future. You can save by not installing jacks or outlets but under-cabing is false economy.
- All telephone and network cabling should meet or exceed CAT5e standards. This includes not only the quality of the cable, jacks, and termination hardware but, most importantly, the installation practices. The most expensive cable and hardware is wasted if they're not installed and terminated properly.
- Provide two (2) CAT5e cables to each telephone/network location. Don't try to cut corners by saving the cost of wire. Plan for the future and the possibility that network devices may some day be needed in places you don't expect today. Plan for at least one telephone/network jack in every bedroom, one in the kitchen, the living room, the study, the garage, etc.
- Try to identify the room most likely to be used for a home office and provide additional telephone/network cabling for future use. Provide at least one (1) additional RG6 cable and one (1) additional CAT5e cable to support a balanced feed for a cable modem.
- Provide one (1) RG6 coax cable to every potential TV location.
- If you plan a Home Entertainment Center, provide at least two (2) additional RG6 cables from there to the Main Panel location for future use.
- Provide one (1) RG6 cable from your Main Panel location to the CATV service point on the outside of the building.
- Provide two (2) CAT5e 4-pair cables from the Main Panel location to the telephone company's Network Interface Device.
- Other cabling (intercom, video, audio, camera, etc.) should be considered with advice from your communications consultant.

Don't try to cut corners when it comes time to terminate the cabling. This requires special tools and techniques and truly is a job for an experienced

professional. Be prepared to pay your consultant for this service, ensuring that the equipment is installed correctly and in such a way as to retain the manufacturer's warranty.

***Enjoy the rewards of a job well done.***

Like many aspects of building a new home, the design and implementation of a structured cabling system may seem daunting at first. If, however, you approach it as an investment in your enjoyment of your new home, you'll find it time and money well spent.

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