An Alta Information Services White paper:
Low Voltage Cabling Questions:

The purpose of this white paper is to identify commonly asked questions about low voltage voice and data cabling.

It is not a technical document, it is meant to clarify a few real world questions and be a very basic resource in regards to some frequently asked cabling questions.

In the event you are looking for these technical specifications, there are many places one can go to obtain these. We recommend one of the following Industry Engineering Resources in this case:

The BICSI (Building Industry Consulting Services, International) website www.bisci.com

The (ANSI/TIA/EIA) Telecommunications Industry Association website http://www.tiaonline.org

The IEEE (Institute of Electrical and Electronics Engineers) website http://www.ieee.org/portal/site

Also refer to:

Cat 5 Cabling Standard: ANSI/TIA/EIA-568-B.2, Commercial Building Telecommunications Standard Part 2: Balanced Twisted pair Cabling Components, 2001

Cat 6 Cabling Standard: ANSI/TIA/EIA-568-B.2-1, Commercial Building Telecommunications Standard, Part 2. Addendum 1: Transmission Performance Specifications for 4 Pair 100 Ohm category 6 cabling, 2002

Cat 6A (Augmented) Standard: ANSI/TIA/EIA-568-B.2-10, Commercial Building Telecommunications Standard, Part 2. Addendum 10: Transmission Performance Specifications for 4 Pair 100 Ohm Augmented Category 6 Cabling, pending publication

Most of these organizations will charge you for these comprehensive specifications.

Most cabling or wiring manufacturers also post technical information/white papers on their websites that can be of assistance in helping you to determine your cabling choices. A few notable well known names are: Seimon, Panduit and Belden.

http://www.siemon.com

http://www.panduit.com/index.htm

http://www.belden.com

If you are unsure, contact your Alta Information Services project manager, we can assist.

Once you choose a manufacturer and a solution for your low voltage cabling , we can help you procure it, and install it. Alta Information Services can help you with your installation, anywhere in the Continental United States, Canada or Puerto Rico.

Common Questions/General Notes:

- **Do I need to replace my wiring when I install my new systems?**

If you are updating an old system and you encounter old wiring, your best option is to replace the old wiring with a more modern Cat 5e low voltage cabling solution. Your old non- twisted pair cabling or cat 3 cable is very susceptible to cross talk and loss.

This is especially true if you are attempting to deploy VOIP or high bandwidth applications such as video in your network. The stark realty is that in most pre-existing buildings of age, there is a more than good chance that there is already a mixture of everything imaginable in your network and in your building.

Most modern day low voltage cabling installations that have been out there for a while are either Cat 3 or Cat 5 cabling . If you are replacing your system and/or you are considering moving towards VOIP in your enterprise, your entire infrastructure should be rated at a minimum of cat 5e. Alta Information Services can easily assist you with these conversions, whether you have 2 locations or 10,000.

There are a lot of installers recommending Cat 6 low voltage cabling solutions these days as well. Unless you are going to be using this cabling for an incredibly high bandwidth application, the cost of a cat 6 low voltage cabling solution is sheer over-kill. Consider your bandwidth today, and consider your bandwidth in the future in that particular facility before making this decision, it is very expensive. There are also other considerations to this investment, among them; do you own the bldg where you are? If you lease and could potentially move to a new location one day, these costs are sunk. To attempt to de-install your wiring, move it and re-install it is an expensive and almost surely damaging proposition.

➢ Should I perform a wiring survey?

It is a highly recommended that if you are going to be replacing your phone system, your network, or other systems, that you perform a wiring site survey with a professional organization to give recommendations about what you have and more importantly, what you need to operate your new equipment efficiently and trouble free. Alta Information Services are experts at wiring site surveys. These can be well worth the minimal amount of money you spend versus taking the chance. Whether you have one office to survey or 10,000, we can quickly assist you with this. At the same time, this can also include (and we highly recommend) a Jack Survey to check connections, inserts, connectivity, etc. These take the most punishment in your infrastructure from people constantly plugging, unplugging and inadvertently pulling on wires coming out of the jacks over time.

➢ Are their other things I should be looking at in regards to my wiring/cabling?

Yes, definitely. In fact, the issues can go further upstream. You might have adequate wiring, but it is a real good chance, especially if your facility is dated, that your patch panels for your low voltage cabling in your Main Distribution Frame (MDF) closet or your Intermediate Distribution Frame (IDF's) are out of date, have no capacity for the growth or could be mismatched for performance.

➢ How long can I run Cat 5 cable?

The standards for cat 5e and cat 6 low voltage cabling call for a maximum length of 90 meters or 295 feet. While you may be tempted to run the cable longer, it is definitely not recommended. Even if you get whatever you are connecting to function initially, problems will show up later, it is almost guaranteed. If you have a run to make and it is farther away than 295 ft, consider putting in a signal repeater in the middle of the line or the best recommendation for you would be to use fiber optic cable.

- **What if the runs I need to make are longer than the 295 ft standard?**

If the length of the run you have to put in is between 295 and 590 feet, a repeater is the recommended solution for you. There are many low cost solutions available for this. The trick here is that both sides of the connection from the repeater have to be within the 295 ft rule/standard. In other words, it would do no good to have one side of the run 50 ft and the other 540 ft. put the repeater as close to the middle as you can.

If the Connection you need to run is more than 590 ft, or if the run is outside, fiber is the recommended solution. In using fiber optic cable, you will need media converters on each end of the fiber to connect this to the rest of the network. The Fiber uses light to transport signals, copper wires uses electrical signs. If the fiber is used outside and will be going underground, it will need to be installed using conduit or armored cable. Ask your Alta Information Services Project Manager about your options here.

- **Can I protect myself by cabling with Cat 6 for future bandwidth, and use Cat 5 components for connectivity or to save costs?**

Yes, although it is not recommended. A cat 6 solution is not a certified cat 6 low voltage cable solution unless it contains all cat 6 components, patch panels, jacks, inserts, etc. Cat 6 is backwards compatible with cat 5. If you do decide to use cat 6 cable and cat 5 connectivity components, and in the future plan to complete the cat 6 upgrade entirely, insure your installer leaves adequate slack at each end of every run to re-splice.

➢ What is the difference between plenum and non-plenum cabling?

"Plenum" is a fire code rating. Its designator is “CMP" meaning a communications plenum rated cable. Plenum cable has an outside jacket made of Teflon material versus the Non Plenum cable jacket which is made of PVC Plastic. Non-Plenum cable jacket is usually designated as CM or CMR.

Plenum rated cable is required to be used in spaces designated for air-handling, such as drop ceilings that conceal return air vents in office buildings. The Teflon coating gives off less poisonous gas than PVC when it burns. When you use plenum cable in air-handling spaces it minimizes poisonous gas from being created and spread throughout the building through the air ducts in the event of a fire.

Most commercial buildings require the use of plenum type low voltage cable. Check with the Building Manager, the local fire marshal or building inspector is you have any questions at all. Local laws on this vary from town to town and even by municipality. You can even refer to the NEC (National Electrical Code) book, section 800.51 (A). Or the UL 2004 Cable Marking Guide (page 21: CMP). Contact your Alta Information Services project manager for more information, they can help to guide you thru the right solution and type of wiring you need.

For a quick reference to some specifications, we are including the following:

TIA and ISO Classifications				
Frequency Bandwidth	**TIA (Components)**	**TIA (Cabling)**	**ISO (Components)**	**ISO (Cabling**
1 - 100 MHz	Category 5e	Category 5e	Category 5e	Class D
1 - 250 MHz	Category 6	Category 6	Category 6	Class E
1 - 500 MHz	Category 6A	Category 6A	Category 6A	Class E_A
1 - 600 MHz	n/s	n/s	Category 7	Class F

Type of Application					
Application	**Category 5e Class D**	**Category 6 Class E**	**Category 6A Class E_A**	**Class F**	**Class F_A**
4/16 MBPS Token Ring	x	x	x	x	x
10BASE-T	x	x	x	x	x
100BASE-T4	x	x	x	x	x
155 MBPS ATM	x	x	x	x	x
1000BASE-T	x	x	x	x	x
TIA/EIA-854		x	x	x	x
10GBASE-T			x	x	x
Broadband CATV				x	x

Contact us today at www.altainfoserv.com for more information on your National Wiring Needs.

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