AMERICA
CABLE SYSTEMS

FIELD REPORT

SCIENCE BUILDING PUTS SQUEEZE ON TELECOM WIRING

When the design of a science building put a squeeze on the campus-wide wiring of a voice and data network, Messiah College in Grantham, Pennsylvania, turned to America Cable Systems (ACS) of New Bedford, Massachusetts, for some relief.

A new voice and data network at Kline Hall of Science, presented a unique challenge for Messiah College, Grantham, PA.

Founded in 1909 as a Bible college, Messiah College provides a comprehensive undergraduate program in a small college atmosphere of 2,400 students. The college offers more than 40 majors, ranging from the fine arts to engineering.

To keep competitive with larger colleges, Messiah has added and/or updated its physical plant to support academic programs, especially in the sciences. In 1995, the college wired all the academic buildings on the 360-acre campus with a voice and data network using Category 5 unshielded twisted pair copper cable. "We wanted to equip every office, every classroom, and every laboratory," said John Holmes, director of physical plant.

The majority of building wiring consisted of running cable through conduit or Wiremold duct work to get to the locations, and putting cable trays where they were needed.

However, the Kline Hall of Science, built in the 1970s, could not be wired the same way as the other buildings. The 65,000-square foot building, with one ground floor and three upper floors, was "chock full of stuff not found in any of the other buildings," Holmes said. Everything from vacuum lines, to gas lines, to water lines, to supply and return duct work filled the space above the drop ceiling running down the central corridors. The building was originally constructed without cable tray. Now, space in the ceiling was so crowded it didn't allow enough room for adding cable tray. Holmes said, "We had to figure how we were going to get an array of copper from the telecommunications closet on the first floor up to all of the floors where it needed to be."

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-- John Holmes, Physical Plant Director

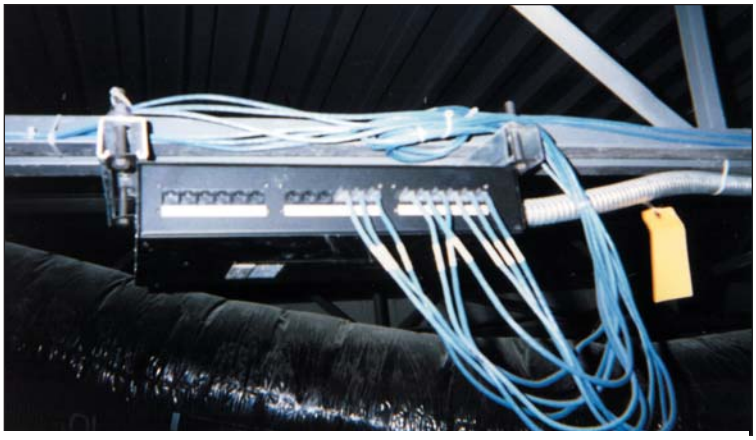
Holmes scanned magazine ads for wiring solutions and eventually contacted ACS about its modular zone wiring system. ACS offered a simple, but elegant solution: pre-cut and tested Category 5 home-run cables with connectors, pre-cut and pre-tested extender cables with connectors, and pre-tested 24-port zone boxes. The home-run cables could be run by the contractor from the intermediate telecommunications closet on the first floor, through conduit to other floors, and then down a central corridor to zone boxes in the ceiling. Extender cables from the zone boxes could be pulled through the ceiling and dropped down to the desktop either via power poles, or brought up from the floor below to the desktops on the next level. Cable tray did not have to be used.

Holmes put together a college committee to consider ACS's wiring solution for the science building. He also asked an electrical contractor to look at what ACS offered versus going with cable tray in the time honored fashion. The latter technique would involve hanging cable tray in the crowded ceiling and then running individual pairs of wire down through cored openings, which would have to be firestopped.

"Everyone agreed that ACS offered the best solution," said Holmes. "It also turned out to be the

least expensive, could be done very rapidly, and offered capacity for future use at no additional charge."

Before the installation took place, ACS provided Holmes with computer-aided design diagrams showing exactly where the wiring would take place, a description and list of all the materials, and a quote for the materials. Three electrical contractors reviewed the ACS materials before they bid on the job.



ACS's zone distribution box is prefabricated and tested at the factory so components can simply be plugged in at the jobsite.

John Fullerton, a local electrical contractor, got the job. Because the science lab could not be closed down for the installation, Fullerton and his crew had to work efficiently around class schedules in order to complete the project expeditiously.

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ACS provided the contractor with extender cables and home-run cables wrapped in a nylon tape binder to create trunks. Each home-run trunk consisted of 24, plenum-rated four-pair Category 5 unshielded twisted pair cables. Each cable and extender cable was cut to the required length and fitted with the appropriate connectors. The cables also came labeled showing where they fit in the diagram for each floor.

In designing the wiring system, ACS looked at the number of zone box ports needed for the present and allocated for up to 25 percent more ports. ACS's design called for one 24-port zone box to be shared by two classrooms. Each zone box provided four to six spare ports, which could be used if another computer or telephone was added to the classroom.

The contractor installed the home-run trunks down the central core of the corridors in the building. Each home-run cable trunk extends from the intermediate telecommunications closet on the first floor out to the appropriate zone box in the ceiling. These cables are factory terminated on to standard RJ-45 modular jacks in the zone distribution box. Extender cables run from the zone box to the desktop. The extender cables have RJ-45 plugs on one end, which allow them to be plugged into the zone box. The other end of the extender cables has an AMP ACO connector which connects to an AMP ACO outlet for either voice or data.

To reach individual outlets, the electrical contractor either went up by coring through the floor above the ceiling or down by dropping duct from the ceiling to the floor below. The wiring in the ceiling of the first floor takes care of the voice and data needs of the first floor and the ground floor. The wiring in the ceiling of the second floor handles the third floor above it as well as the second floor below it. The contractor suspended cable trunks from either ceiling beams or added some framing to support the trunks.

Since the installation, Holmes has not had any problems with the wiring, which he frequently tests to meet Category 5 performance levels. "We either have gotten a 98 percent or 99 percent up to scratch on the testing," said Holmes.

According to Holmes, the installation was easy, "all we had to do was plug the cables into the zone box in the ceiling, trail the cable through some conduit, and come out where we wanted to have the AMP ACO outlets. We did not have to use cable trays, which have the electrical contractor said would have been hard to do because of the duct works and pipes."

Holmes said that ACS's modular pre-fab wiring solution also allows for expansion to new locations without having to purchase a lot of additional cables, zone boxes, or outlets. For example, as new computer or telephones were added, extender cables can be run from the zone box to the desktop. As services are eliminated, zone boxes and cables can be moved to new locations. "Now that the decision has been made to build an addition to Kline Hall, we have all the wiring capacity we need," Holmes said.

"It also turned out to be the least expensive, and could be done rapidly, with future use at no additional cost," said Holmes.

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