

Streamlining Surveillance

CCTV Cabling Made More Cost-Effective

BY JEFFREY HERMAN

Orbit Systems, a New Hampshire-based security and surveillance systems integrator, is becoming one of a growing number of companies helping to streamline CCTV security and surveillance cabling installations by eliminating traditional coaxial cable and replacing it with unshielded twisted pair (UTP) cable. Orbit's recent installation at Taunton State Hospital, located in Taunton, Mass., is a typical success story in the deployment of UTP cable for CCTV security and surveillance monitoring systems.

Scope

The Taunton State Hospital CCTV surveillance system spans three buildings and provides indoor CCTV monitoring of all hospital hallways, exits and critical areas. Thirty-one CCTV cameras are deployed. Each building has three floors and cameras are on all floors. Monitoring equipment is located on the first floor of the main building in the security room of the main reception area. Figure 1 is a diagram approximating the actual installation.

Equipment Used

The CCTV monitoring equipment used in the installation includes the following:

- 14 Silent Witness V27 410 Lines Resolution CCTV Cameras
- 17 Silent Witness SWC20 410 Lines Resolution CCTV Cameras
- 3 Robot MV16P Black & White Video Multiplexers



- 3 Pelco TLR2024 Time Lapse Video Recorders
- 3 Sony SSM-175 Black & White 17" Monitors
- 62 NHC VideoEase CCTV Screw Terminal Baluns (500009)

The interior cabling of the hospital consists of 50 percent Category 3 UTP and 50 percent Category 5 UTP cable. The longest cable run is around 1,200 feet, with the average

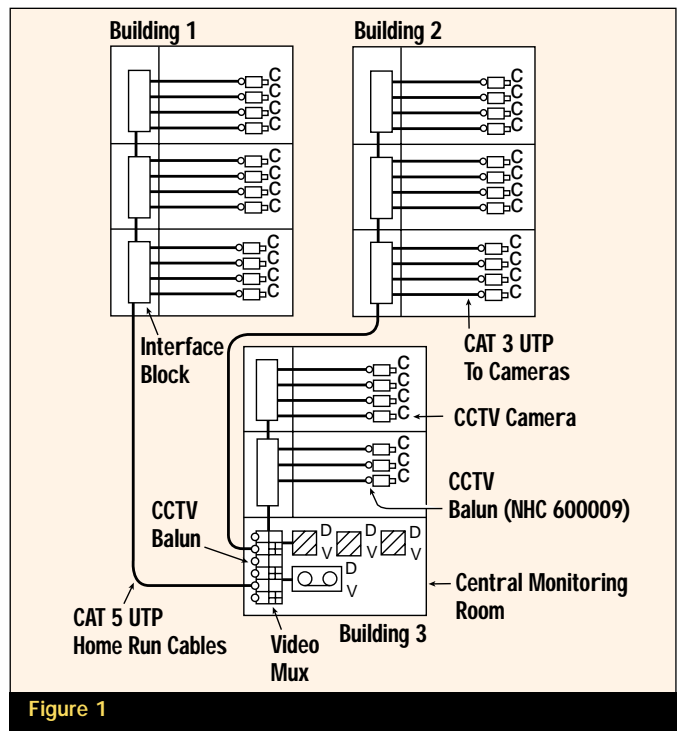


Figure 1

being around 500 feet. There are wiring closets throughout the complex, and the installation used interface blocks in many of the electrical closets to consolidate and distribute the camera wiring.

Most of the installation utilizes all four pairs of each Category 5 cable thus supporting four camera signals under one cable jacket. The Category 5 cables are broken out to each camera at the wiring closet via Category 3 cables. The CCTV balun that is used to eliminate the coax interfaces is the NHC VideoEase CCTV Balun (500009). (See Figure 2.) A total of 62 are needed to convert all interfaces.

According to Steve Feinberg, president of Orbit Systems, "The installation was trouble-free and the picture quality of the system was excellent. The customer is very satisfied."

Benefits of UTP vs. Coax

During the course of the installation, Orbit Systems discovered many attractive points to cabling CCTV with UTP versus coax. According to Feinberg, the following benefits were noteworthy.

1. UTP is easier and faster to deploy than coax. A guide hole in the box ensures that UTP is pulled out without getting tangled. Coax on the other hand often gets tangled while being unspooled, leading to costly delays.
2. The size of the boxes of UTP required for a given length of cable is less than that required for coax, thus reducing the handling and



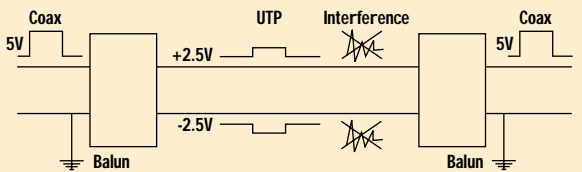
Figure 2

What is a Balun?

A balun is the essential link between the CCTV equipment and the structured cabling system. Used in pairs, the CCTV balun allows CCTV video to be transmitted via UTP without visible

picture interference or distortion. The word balun is short for BALANCED to UNbalanced. The

balun converts an unbalanced signal (coax) to a balanced one (UTP) as illustrated in Figure A. The unbalanced signal is protected by an outer shield. The shield stops any outside interference that hits the cable.



UTP, on the other hand, does not have a shield to protect against interference. Therefore, the signal must be converted to a balanced one. The balun, used in pairs, performs this function. In essence, the baluns function as noise eliminators so any interference that impinges on the individual twisted pair conductors is canceled out by the baluns. In addition, the twists in the conductor pair help to also cancel out any interference. The result being that UTP is more immune to interference and the CCTV picture quality is transmitted reliably over extended distances.

3. UTP is easier to work with than coax. The smaller diameter and smaller bend ratio makes it easier to pull cable.
4. In installations where conduits were required, the smaller diameter UTP means fewer conduits are needed.
5. A single Category 5 cable can support up to four cameras under the same jacket. A coax cable supports only one camera signal. The result is greater savings in time and material cost per camera.
6. The lighter-weight UTP cable means easier handling and fewer trips to and from the service truck. According to cable vendors, for a given length of cable, UTP cable weighs up to one-third less than coax.

7. The cost-per-foot of UTP is lower. Plenum coax currently costs \$0.27/ft. Plenum Category 5 UTP currently costs \$0.15 per foot. Coupled with the fact that four camera signals may be transmitted under the same Category 5 jacket, the cost-per-foot-per-camera is \$0.04, yielding cost savings of almost 85 percent. On longer runs where four cameras are clustered in one zone, the savings truly adds up.
8. Standard UTP cross-connect blocks make it easier to terminate and connect CCTV cabling. Punch-down blocks were used by Orbit Systems in its installations.

Picture Quality

One of the main concerns about using UTP rather than coax is the picture quality. Installers and end users have major concerns that the picture quality with UTP is inferior to that of coax. When Orbit Systems was qualifying the move toward UTP, it checked the picture quality using UTP versus

