# CCTV Upgrade Project

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The Hall B Closed Circuit Television (CCTV) consists of thirty-three black and white cameras that cover various fields of view to ensure personnel and equipment safety and to monitor critical gauges. This note presents details of the proposed upgrade and results of an initial test.

The CCTV upgrade will replace the current Panasonic, black and white, fixed position, vari-focal-lens cameras with color, network cameras that use PCs with CCTV software for web display – Axis 2130 with Pan/Tilt/Zoom (PTZ) technology, Fig 1(a), and Axis 211 with fixed position, vari-focal lens, Fig. 1(b). These cameras will be connected to Jefferson Lab's local area network and assigned IP addresses.

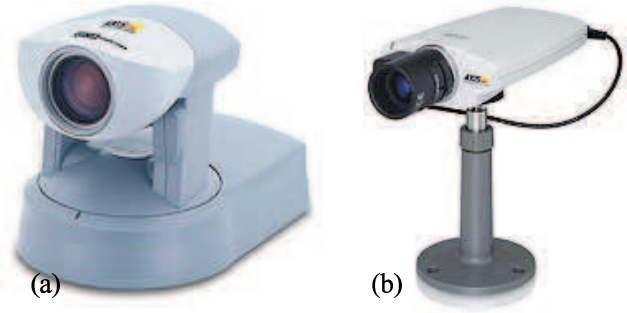


FIG. 1. (a) Axis 2130 PTZ. (b) Axis 211.

The 211s will be manually aimed in the general experimental area and focused for picture clarity; the 2130s functions are web-controllable [1].

Outputs of the 211s and 2130s, which appear as a webpage, Fig. 2, are viewed by opening a web browser.

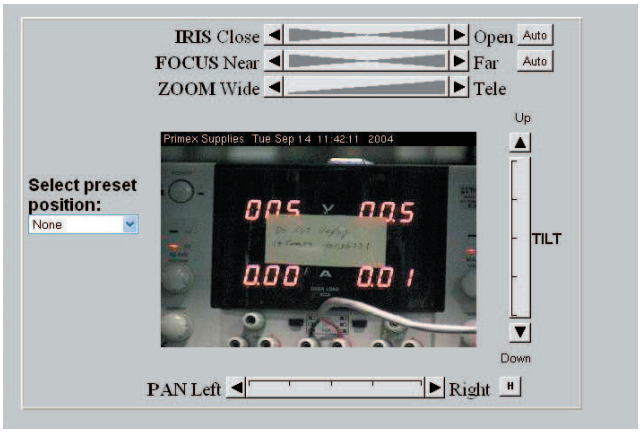


FIG. 2. Directional controls.

The 2130 is centered on a displayed target by moving the cursor inside the camera view and clicking on that target. Rolling the scroll wheel on the mouse controls the zoom functions of the camera. The 2130 can lock onto a specific view that is stored in its memory. The target is selected from a drop box and the camera moves to focus on that target.

The main system display is two twenty-inch flat panel, rack-mount, liquid crystal monitors, which will show four camera outputs – a total of eight viewable cameras at a time.

As an initial test, three 2130s were installed in the end station. The output of the current Burle video switch was connected to an Axis 2400 video network server, Fig. 3, and was given an IP address, making available the current black and white camera views on the network, Fig. 4.

FIG. 3. Axis 2400 video network server.

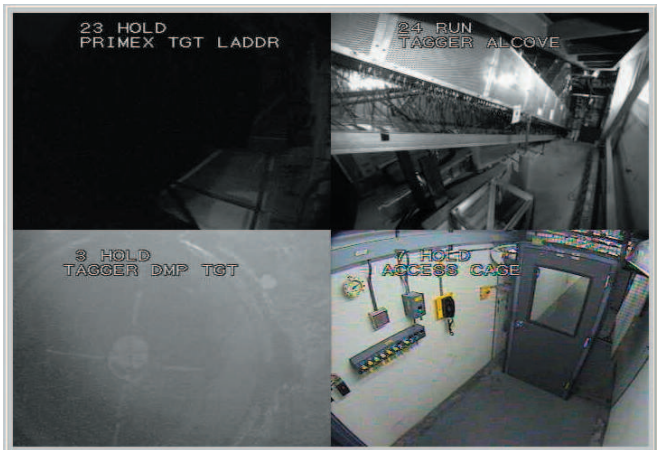


FIG. 4. Current camera views.

The prototype system, the 2130s installed on the Space Frame, yields outstanding picture quality. Frame rate slowdown is directly proportional to the number of camera webpages being viewed and the display size of the view. The frame rate of the 2400 video network server is not as fast as a normal network camera's, but is adequate for the current system's views, since these views are not detailed.

Fast quad processor computers are needed for real-time viewing. A Java-based GUI will help select the quad-camera

views. Initially, to view a camera its IP address will be required. Eventually, each camera will be given a target name that will be used instead of the IP address.

The upgrade will phase out all thirty-three black and white cameras and replace them with color, PTZ cameras. In most cases, several fixed cameras can be replaced by a single Axis 2130. The number of cameras required for monitoring is expected to drop to a third of the current total. The potential to incorporate other safety systems, such as the linear heat detectors, Hall B sniffer, and Hardware Monitoring, into the CCTV system may allow the CCTV system to target specific areas for potential fires.

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[1] www.axis.com.