

CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

DOCUMENT NUMBER: 16750

APPLICATION: MIDDLE AND HIGH SCHOOL

DATE OF ISSUE:

11-10-04 - Revised to include hardware list and to require test results
07-05-02 - deleted routing switchers
08-21-00 - revised
03-04-97 - added note below
07-02-93 - first issued

NOTES:

Provide a CCTV system in accordance with the attached specification. Provide a 2" minimum diameter conduit from the head end equipment to the public right-of-way for future installation of cable TV.

ATTACHMENTS:

Closed Circuit Television System specification, dated **11-10-04**.

MIDDLE AND HIGH SCHOOL CCTV TELEVISION SYSTEM REQUIREMENTS

11-10-04

1. GENERAL

A. General Requirements

- (1) The Contractor shall furnish all materials, equipment, labor and services required for the installation of a complete master antenna and closed circuit television signal distribution system.
- (2) All work shall be performed under the supervision of a company accredited by the basic equipment manufacturer, and such accreditation must be presented.
- (3) All basic electronic equipment specified herein shall be produced by a manufacturer of established reputation and experience who shall be able to refer to similar installations which have rendered satisfactory service.
- (4) All equipment and materials, including wiring and cabling, furnished under this contract, shall be guaranteed for a period of one year from date of final acceptance of the system against electrical or mechanical defects except when such defects are caused by misuse. Guarantee shall cover labor and materials.
- (5) The Contractor shall show satisfactory evidence upon request that he maintains a fully equipped service organization capable of maintaining the installed system.
- (6) The Contractor shall construct the system following good engineering practices and in accordance with acceptable codes and safety precautions.
- (7) The Contractor shall furnish (after the system is installed) set of operating instructions and/or information necessary for the proper operation and maintenance of the system as built. Circuit diagram shall be part of these instructions. Two complete sets of the above information shall be provided with the close-out documents.

B. Applicable Sections

- (1) General technical requirements for this section are specified elsewhere.
- (2) Conduit, outlet boxes, etc., are specified in the Section "Basic Materials and Methods".

C. Systems, Functions and Capabilities

- (1) The system shall provide distribution of modulated television channels 2-13. Demodulators with selectable channel inputs shall provide audio and video to channel 2-13 modulators with appropriate routing (section C. 5a). **See paragraph 2G, Hardware Summary.**
- (2) Television signals will be provided by cable provider and will be routed to input of demodulators. If amplification of standard cable signal is necessary then it shall be provided to overcome losses in distribution to demodulators. Antenna array on building will not be needed. **See paragraph 2G, Hardware Summary.**

- (3) The distribution system shall furnish signal to all TV outlets shown on the documents.
- (4) The system shall provide reception quality in each outlet equal to or better than received with individual antennas in the particular area with no ghosts or adjacent channel interference. Provide additional filters if necessary. Signal strength at the outlet shall be a minimum of 0 dBmV (1000 microvolts across 75 Ohms) and a maximum of 10 db. If local pickup is a problem, the installer shall use suitable means to overcome it, such as high signal levels at the outlet.
- (5) The system will consist of all closed circuit television channels 2-13. Channel 6 will be provided with appropriate sub-channel converters for reverse feed throughout building. Modulators will be provided with filters (if needed) to eliminate adjacent channel interference. If modulator outputs are not equal to total system R F design, then post amplification will be necessary. No post amplifiers are to be placed anywhere other than head end cabinet. System design should reflect no need for amplification of trunk lines out in building. No active combiners are to be installed. (Passive with post amplification is appropriate). **See paragraph 2G, Hardware Summary.**
 - a. The system shall be able to accept modulated sub-channel inputs at any outlet in the installation and convert the sub-channel to VHF Channel 6 at the head-end, to be distributed over the trunk line throughout the entire installation.
 - b. Appropriate VHF channel amplifiers will be provided along with air channel amplifiers to distribute closed circuit information throughout the entire installation.
- (6) The distribution system shall be operative at all times in such a manner that it is not subject to possible human error during the course of attachment or detachment of equipment at any outlet.
- (7) The system as installed shall be rated and capable of continuous 24-hour operation.

D. Head End Location

- (1) Antenna system head end shall be located in the Media Center.
- (2) When previous installation includes head end elsewhere in the school, the Media Center will be provided with outlets. Outlets shall be specified.

2. MATERIALS

A. Cables

- (1) Coaxial cables shall be run in continuous lengths except for terminations and no splices shall be permitted in any conduit run. Cables shall be installed to avoid sharp bends or physical distortion. Cable shall be CAC-6 or better. Runs exceeding 400 feet in length shall be RG-11 cable.
- (2) Cable runs including splitters for any trunk line shall not incorporate losses exceeding 65% sub-channel modulator output.

B. Housing

- (1) Housing shall be 19 inch rack type with 72" inches of panel mounting space. Housing cover shall have 11-tumbler lock. Cover shall be hinged and locked from left to right side. Housing shall be free standing as shown on the documents.

C. Tapoffs (Flush-mounted)

- (1) Wall type tapoffs shall be provided at each location shown on the drawings. Height of tapoffs to be between 12 inches to 48" from the floor.
- (2) Tapoffs shall incorporate provisions for sub-channel inputs.
- (3) The tapoffs isolation network shall be of the backmatched type design, using high quality torrodal ferrite transformer circuits.
- (4) Provisions shall be incorporated in the network to prevent 60 cycles AC or DC feedback into the feeder or trunk lines.
- (5) Distribution cable connection to the outlet plates shall be such that a visual inspection shall assure continuity of the exposed center conductor through the tapoff.
- (6) Each tapoff shall meet or exceed the following parameters:

Impedance- Bridging input (75 ohm through line)

Tapoffs shall be designed to cover a frequency range of 12MHz to 216 MHz and 470-890 MHz. Insertion loss shall not exceed 2.5 dB at any frequency within the designed frequency range or a 17 dB isolation network.

- (7) Tapoffs shall be Blonder-Tongue or equivalent.
- (8) One 10 foot connecting cable with F-59 connector on one end and a connector compatible with the tapoff on the opposite end shall be provided for all distribution outlets. Cables shall be turned over to Owner prior to acceptance of the system.

D. VHF Amplifiers

- (1) Head end will consist of one channel amplifier for each channel specified (no Broadband Amps). Blonder-Tongue MCA-b-3 volt output gain 55 dB.
- (2) The channel of operation shall be clearly imprinted at the factory on the face of each amplifier. Blonder-Tongue MCA- or equal.

E. Sub-Channels

- (1) An audio-video modulator will be provided with a capability of 6 MHz sub-channel to be connected to antenna system at any outlet. The modulator is to have the following features:

Audio Input	LOZ - Mike, Hiz - Mike, Aux
Video Input	I-V P-P (NOM) 75 ohms
Output	RF sub-channel T-9 75 ohms
Controls	Video Level, Audio Level
AC	117 V 60 cycle 3 wire grounded power cord

Blonder-Tongue T-11 SAVM

- (2) A Sub-channel filter and converter/amplifier will be provided in head end to convert the modulated sub-channel to VHF Channel 6. Other sub-channels may not be used because of future facilitation of other VHF channels. Sub channel T-11 modulator. See paragraph 2G, Hardware Summary.
- (3) If preamplification of sub-channel signal is required (because of trunk line return loss) it shall be provided.
- (4) Sub-channel converter/amplifiers shall be designed for 24 hour operation.
- (5) A channel 6 strip amplifier will be provided to raise signal levels with the rest of the system, if required.

F. Splitters

- (1) Splitters shall be Blonder-Tongue Model MS-2 U/V or MS-4 U/V or approved equal.
- (2) Cables shall meet specification listed under Cable Section.

G. Hardware Summary:

Blonder Tounge

- a) SWC-1528 – wall cabinet
- b) MIRC-12V – rack frame
- c) MIDM – Agile demodulator
- d) AMCM-806 – Agile modulator
- e) MIPS-12G – power supply
- f) ZDM-806 – sub-channel demodulator
- g) DSV-42 – combiner
- h) BIDA-550-80 – post amp
- i) ZHC-12 – channel combiner
- j) MAVM-861 sub-channel modulator

3. EXECUTION

A. Acceptance Tests

- (1) The Contractor shall, upon completion of the system, orient all antennas, adjust all controls, etc., to provide a system operating within parameters set forth in these specifications.
- (2) Acceptance tests are to incorporate field strength levels as well as visual presentation on a color television receiver to assure signal quality.
- (3) Test results shall be provided to the owner prior to acceptance of the system.

END OF SECTION