SPECIAL SPECIFICATION
8728
ATM Video Coder/Decoder (CODEC) System

1. **Description.** This Item shall govern for the furnishing and installation of the ATM Video CODEC Systems in designated buildings as shown on the plans and as detailed in accordance with these specifications and as directed by the Engineer. All ATM Video CODEC systems shall be of the same manufacturer and model.

2. **Materials.**

   (1) **General Requirements.** All equipment shall be new and in strict accordance with the details shown on the plans and in the specifications.

   (2) **Functional Requirements.** The ATM Video CODEC system shall provide separate subsystems for coding and decoding functions for maximum network reliability, and control software, as required, to control, monitor and configure the subsystems. The ATM Video CODEC coding subsystem shall convert audio and video inputs from analog form to a compressed or uncompressed digital format encoded over an ATM cell stream for transport over a ATM network. The decoding subsystem will convert the ATM cell stream back to the analog form. The ATM Video CODEC shall have a standard OC-3 interface for connection to the ATM network. The video CODEC shall employ the Motion JPEG algorithm for video coding and decoding and support, as a minimum, a standard NTSC, RS-170A video signal. The control software shall operate under Windows NT, latest version or version directed by the Engineer, and shall provide a documented programmable API for integration by third party into existing systems.

   (3) **Performance Requirements.** Signal format shall be NTSC color. Amplitude shall be one (1) volt peak to peak and impedance of 75 ohms unbalanced.

      (a) The ATM Video CODEC system shall support the following:

         Field Time Distortion of less than 1.5 IRE.

         Line Time Distortion of less than 1.5 IRE.

         Differential Gain +/- 3 percent.

         Signal to Noise ratio shall be 56 DB minimal.
(b) The encoder subsystem shall:

Support a minimum of six (6) RCA/Phono jacks configurable as six (6) composite channels or three (3) S-Video channels; video inputs shall be able to be multiplexed on to one (1) to four (4) user selectable video output streams.

Support uncompressed digital video support for 24 Bit, 16 Bit, or 8 Bit RGB; Compressed Motion JPEG digital video with software selectable compression factors from 16 to 024.

Have analog sampling regions and digital display size configurable on a per stream basis (i.e. downscaling of sampled regions to support display sizes).

Support for control of input brightness, contrast, and color over the ATM network.

Software configurable cell pacing for ATM output streams to ensure compliance with network traffic compliance.

Support 8 and 16 bit A-Law or U-Law for stereo or mono encoding formats with sampling rates of five (5) kHz to 44.1 kHz (CD) and 48 kHz (DAT).

Support for an External Configuration Module (ECM) interface.

Support for ATM Forum UNI 3.0 signaling as a minimum.

Support a 155 Mbps OC-3 Multi-mode fiber ATM uplink with SC physical connectors.

(c) The decoder subsystem shall:

Support as a minimum NTSC (60 Hz) video format.

Support for two (2) RCA/Phono jacks for S-Video Output and two (2) RCA/Phono jacks for duplicated composite signal.

Support the concurrent decompression of one (1) to four (4) digital video streams from the ATM cell stream.

Support Picture in Picture (PIP) and tiled video presentation features.

Have a configurable on screen menus for at least 200 videos.

Support video sequencing of at least 200 videos with configurable dwell times.

Provide for infrared remote control of on screen menu system for configuring output.

Support for an External Configuration Module (ECM) interface.

Support for ATM Forum UNI 3.0 signaling as a minimum.

Support a 155 Mbps OC-3 Multi-mode fiber ATM uplink with SC physical connectors.
Support Quad screen viewing.

Support multiple simultaneously tours within Quad screens.

Support tours within menus.

Be able to switch display between individual videos, tours single, and/or quad screen using on-screen menu commands.

(4) **System Indicators.** System indicators shall show conditions of incoming signals and report improper equipment functioning. System indicators shall be Light Emitting Diodes (LED). The LEDs shall be located on the front panel of the coder and decoder subsystems.

Front Panel LEDs shall include, but not be limited to:

ATM network connectivity status. Green shall denote normal operation and red shall denote non-operation.

Video Transmit indicator shall flash to indicate transmit.

Video Receive indicator shall flash to indicate receive.

Audio Transmit indicator shall flash to indicate transmit.

Audio Receive indicators shall flash to indicate receive.

3. **Power Requirements.** Video CODEC furnished, assembled, fabricated, or installed under this Item shall meet all of its specified requirements when the input power is 115 VAC +/- 10 percent 60 plus or minus three (3) HZ, single phase, or as approved by the Engineer. The maximum power requirements shall not exceed 120 watts.

The equipment operations shall not be affected by the transient voltages, surges and sags normally experienced on commercial power lines. It is the Contractor's responsibility to check the local power service to determine if any special design is needed for the equipment. The extra cost, if required, shall be included in the bid of this Item.

(1) **Wiring.** All wiring shall meet the requirements of the National Electric Code. All wires shall be cut to proper length before assembly. No wire shall be doubled back to take up slack. Wires shall be neatly laced into cable with nylon lacing or plastic straps. Cables shall be secured with clamps. Service loops shall be provided at all connections.

(2) **Transient Suppression.** All DC relays, solenoids and holding coils shall have diodes or other protective devices across the coils for transient suppression.

(3) **Power Service Protection.** The equipment shall contain readily accessible, manually resettable or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection.

Circuit breakers or fuses shall be provided and sized such that no wire, component, connector, PC board or assembly shall be subjected to sustained current in excess of their respective design limits upon the failure of any single circuit element of wiring.
(4) Fail Safe Provision. The equipment shall be designed such that the failures of the equipment shall not cause the failure of any other unit of equipment.

(5) Modular Design. The equipment shall be modular in design to allow major portions to be readily replaced in the field. Components shall be hot-swappable. Modules and assemblies shall be clearly identified with name, model number, serial number, and any other pertinent information required to facilitate equipment maintenance.

(6) Connectors and Harnesses. All external connections shall be made by means of connectors. The connectors shall be keyed to preclude improper hookups. All wires to and from the connectors shall be color coded and/or appropriately marked.

Connecting harnesses of appropriate length and terminated with matching connectors shall be provided for interconnection with the communications system equipment.

Patch fibers with mixed connectors shall be uniquely color coded for easy identification.

All pins and mating connectors shall be plated with not less than 20 microns of gold. Connectors utilizing solder type connections shall have each soldered connection covered by a piece of heat shrink tubing securely shrunk to insure that it protects the connection.

All assemblies shall be clearly identified with name, model number, serial number and any other pertinent information required to facilitate equipment maintenance.

4. Environmental and Safety Requirements. All ATM Video CODECs furnished, assembled, fabricated, or installed under this Item and configured for the network architecture shall be compliant with the following:

(1) Environmental Requirements. All specified requirements shall be met during uncontrolled environmental operations characterized by a temperature range of zero (0)°C to +40°C and a humidity range of 10 percent to 90 percent (non-condensing).


(2) Safety Requirements. Safety in compliance with Underwriter's Laboratories (UL) 1950.

Fire resistance requirements specified by Underwriter's Laboratories in UL 1459, 2nd Edition.

5. Experience Requirements. The Contractor or designated subcontractors involved in the installation and testing of the ATM Video CODEC System shall, as a minimum, meet the following requirements:

Three (3) years experience in the installation of ATM equipment.

Two (2) installed systems where ATM Video CODEC Systems have been in continuously satisfactory operation for at least one (1) year. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses
and telephone numbers of the operating personnel who can be contacted regarding the system.

Integration of ATM Video CODEC System into one (1) communication system involving ATM networks running at OC-3 (which may be one (1) of the two (2) in the preceding paragraph) which the Contractor can arrange for demonstration to the Engineer and/or his representative.

The Contractor will be responsible for providing necessary documentation of subcontractor qualifications pursuant to contract award.

6. Technical Assistance. The Contractor shall ensure that a manufacturer's technical representative is available on site to assist the Contractor's technical personnel at each installation site and with ATM Video CODEC System equipment installation and communication system configuration.

The initial powering up of the ATM Video CODEC equipment shall not be executed without the permission of the manufacturer's representative.


(1) General. The equipment design and construction shall utilize the latest available techniques with a minimum number of parts,

Subassemblies, circuits, cards, and modules to maximize standardization and commonality.

The equipment shall be designed for ease of maintenance. All component parts shall be readily accessible for inspection and maintenance. Test points shall be provided for checking essential voltages and waveforms.

(2) Electronic Components. All electronic components shall comply with Special Specification, "Electronic Components".

(3) Mechanical Components. All external screws, nuts and locking washers shall be stainless steel; no self-tapping screws shall be used unless specifically approved by the Engineer.

All parts shall be made of corrosion resistant material, such as plastic, stainless steel, anodized aluminum or brass.

All materials used in construction shall be protected from fungus growth and moisture deterioration.

Dissimilar metals shall be separated by an inert dielectric material.


12. **Measurement.** This Item will be measured as each unit furnished, installed, made fully functional and tested in accordance with these special specifications or as directed by the Engineer.

13. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit bid price for each "ATM Video Encoder" or "ATM Video Decoder". This price will include all equipment described under this Item with all cables and connectors; all documentation and testing and shall also include the cost of furnishing all labor, materials, warranty, training and equipment necessary to complete the work.