

Performance Specification

1.00 Overview

This specification is for a Fire Station Alerting system to be installed in one or more fire stations. This new system shall be a US Digital Designs "Phoenix G2" system or equal. It shall be capable of interfacing to, and receiving alerts from a data network, radio network, and two-tone paging system. The system shall be based on standard EIA/TIA 568-B Category 6 data network cabling and RJ-45 Data connectors it shall be installable by a low voltage-cabling contractor. **Note: Do not use Copper Clad Aluminum wire (CCA) due to this wire causes poor data connectivity.** The alerting system shall accommodate connections to systems such as lighting control, telephone paging, voice radios, doorbell buttons, and other devices. These systems and their installation will be specified in other sections and provided by the owner or other trades.

1.01 Section Includes:

Fire Station Alerting system equipment with an ATX Fire Station Controller along with an optional Expansion Unit installed in a central location and peripherals consisting of Room Remotes, Message Remotes and BetaBrite message signs, Sign Remotes, Gamma Signs, Room Remote 2 (RR2), Color Indicator Remote, I/O Remotes, HDTV Remotes, other Peripherals, audio amplifiers, and speakers located throughout the Fire Station.

1.02 References

- A. Underwriter's Laboratories UL-1069.
- B. Electronics Industry Association / Telecommunications Industry Association.
- C. National Electrical Code.
- D. U.S. Dept. of Labor / Occupational Safety and Health Administration.
- E. National Fire Protection Association 1221.

1.03 Qualifications

- A. Certified low-voltage system installer.
- B. Applicable state licenses.
- C. **Certificate of successful completion of manufacturer's installation/training training for the equipment being proposed.**

1.04 Related Work Provided in Other Specification Sections

- A. Unless noted otherwise, the following work is to be provided under other specification sections:
 1. Installation of conduits, raceways and electrical junction boxes.
 2. 120 VAC power wiring and outlets.
 3. Overhead lighting.
 4. Rough openings and framing for equipment cabinets and Peripherals.

1.05 System Description

- A. System hardware shall consist of a Station Alerting Controller and possible Expansion Module and multiple peripheral units. These peripherals shall be one or more Message Remotes with BetaBrite message signs, Room Remote 2 (RR2), Sign Remotes, Color Indicator Remotes, Gamma Signs, HDTV Remotes and I/O Remotes. System speakers shall be Bogen S86 or equivalent speakers for non-lighted applications, US Digital Designs low-voltage Speaker Lights for lighted applications, and Bogen NEAR A2 speakers for apparatus bay and outside applications. Push Button for acknowledgement of an alert, emergency or doorbell use.

- B. All necessary equipment required meeting the intent of these specifications, whether or not enumerated within these specifications, shall be supplied and installed to provide a complete and operating fire station alerting system.

- C. System firmware shall be the product of the station alerting system manufacturer with sole control over revisions and/or changes. Manufacturer shall provide, free of charge, product firmware/software upgrades for a period of one year from date of installation for any product feature enhancements. System firmware upgrades shall not require any exchange of parts and shall be capable of being executed via a laptop computer connection, a web browser, and the SSL protocol.

1.06 Submittals

- A. Any supplying contractor proposing equipment which is not the base standard for this specification, must provide full submittals at the time of bid. This option shall be exercised at the discretion of the owner/specifying authority.

- B. In the event the specifying authority decides to reject the submittals of a supplying contractor, the specifying authority may ask the contractor to re-submit if the discrepancies are minor. Otherwise rejection of submittals means the specified product must be supplied.

Part 2—Products

2.01 Manufacturers

The products specified shall be new and of the standard manufacture of a single reputable manufacturer. As a reference of standard and quality, functionality and operation, it is the request of the owner that bids be based only on equipment manufactured by US Digital Designs, Tempe, Arizona.

2.02 Cabling

Cabling shall be in strict accordance with local codes and to the cable specifications found in the manufacturer's installation manual.

All peripheral network cabling shall be ANSI/EIA/TIA-568 Category 6 UTP plenum rated cable run as shown on drawings. Cable jacket shall be YELLOW in color. Use RJ-45 Data connectors. Certification documents shall be provided for all cabling runs. **Note: Do not use Copper Clad Aluminum wire (CCA)**

Message Remote to BetaBrite message sign data cable shall be flat grey 6 conductors telephone device cable with 6 conductor modular plugs attached on both ends. Wiring shall be straight through. Wiring comes with the BetaBrite sign.

All speaker cabling shall be Plenum rated 18 gauge, 4 conductor stranded jacketed cable. 18 gauge, 2 conductors stranded jacketed can be used just for the Audio portion or just for the LED portion. Plenum rated 18-4 cable is preferred to use due to possible future expansion of speaker types and just pulling one type of wire.

2.03 Fire Station Controller Equipment

Furnish a Phoenix G2 ATX Fire Station Alerting Controller [19" rack mounted, wall mounted, desktop mounted]. Each unit shall have the following features built into a single cabinet:

- A. Fire Station Controller
- B. 3 Configurable Audio Inputs and Audio Switching System
- C. 8 Port Power Audio Ethernet Mixer (POE ports)
- D. 4 x 20 Watt Audio Amplifiers
- E. 48 vdc low-voltage lighting control
- F. 3 Auxiliary Inputs and 4 Relay Outputs
- G. Touchscreen Industrial Computer with Customer Network (WAN) connection. USB port for UPS monitoring, COM1 Serial connection for Data Radio.
- H. External UPS

2.04 Message Remote

Furnish as shown on plans, Message Remotes capable of the following functions:

- A. Dual Message Sign control
- B. Capable of Alert Information or Turnout Timer display
- C. Independently Controlled Dual 15 Watt Audio Amplifiers.
- D. Lighting Control
- E. Panel or wall-mountable
- F. Single cable connection

2.05 Message Remote 2

Furnish as shown on plans, Message Remote 2 capable of the following functions:

- A. Has 2 Channels
- B. Each Channel can Power/Control a Beta Brite Message Sign, 8 ohm speaker connection, 70V speaker connection and Speaker LED Light connection.
- C. Each Channel 70V speaker connection has a 15 Watt Audio Amplifier.
- D. Lighting Control
- E. Panel or wall-mountable
- F. Single cable connection
- G. Each Channel has 1 Dry contact Input and 1 Dry contact output NO relay.
- H. 8 Ohm speaker connection must be used with an 8ohm/70V Transformer.

2.06 Room Remote 2 (RR2)

Furnish as shown on plans, Room Remote 2's capable of the following functions:

- A. Integrated Message Display.
- B. 10 Watt Audio Amplifier, 1- Line Level Audio OUT, 1-8 ohm Audio OUT and 1-70V Audio OUT
- C. Lighting Control +48VDC output for Speaker LED Lights
- D. 1 Dry Contact Input and 1 Relay Output
- E. Flush or surface mountable.
- F. Single CAT 6 cable POE IN connection and CAT 6 POE OUT connection (for daisy-chain configuration)

2.07 HDTV Remote

Furnish as shown on plans, HDTV Remotes capable of the following functions:

- A. Network connection to ATX Station Controller
- B. HDMI Output to video display
- C. Integrated Alert Message and Turnout Timer display

2.08 Color Indicator Remote

Furnish as shown on plans, Color Indicator Remote capable of the following functions:

- A. Power and network connection to ATX Station Controller
- B. Built-in Ethernet switch to allow up to 3 Color Indicator Remotes to be daisy-chained
- C. 8 Color LED Indicator Display

2.09 Gamma Sign

Furnish as shown on plans, Gamma Sign capable of the following functions:

- A. Message Display
- B. Turnout/Timer Display option
- C. 1 NO/NC Output Relay
- D. 1 Dry Contact Input
- E. Surface mountable and can mount on TV Articulating Arm mount with adapter plate for Dual sign applications.
- F. Single CAT 6 cable POE IN connection and CAT 6 POE OUT connection (for daisy-chain configuration)

2.10 Speaker Systems

Speaker systems shall be either 8 ohm or 70 volt, as per design documents. Speakers shall be grouped into “areas” of similar sound level and unit alerting requirements.

2.11 Hallway / Room Speaker

Speakers may be provided by Alerting System manufacturer, or contractor. Check with System manufacturer for details.

Speakers shall be Bogen S86T725PG8W or as called out on plans. Speakers may be Reg Bogen S86 or Same type model with a LED light ring installed by USDD (Sold only by USDD)

For suspended ceiling applications, provide appropriate speaker support tile bridge. For hard ceiling applications provide appropriate speaker back box.

2.12 Apparatus Room and Outdoor Speaker

Provide as shown on plans, Bogen Communications NEAR AT2 loudspeakers. Available tap settings are 4W, 8W or 16W. They can be tied into the ATX Controller 70V Speaker Output Audio Zones or connected through a Ext Audio Amplifier also supplied by USDD.

2.13 LED Lighted Speaker

Provides low-voltage LED lighted speakers as noted on drawings along with Audio. This low-voltage lighting shall be +48 VDC connected to the ATX Controller 48V LED Light Outputs zones or +48vdc output connections on system peripherals that support that function.

2.14 External Audio Amplifier for Apparatus Bay Applications (Currently Extron Model XPA 2001)

Furnish as shown on plans

- A. Has an Audio Line Level Input from the ATX Controller.
- B. Has a 70V audio output for App Bay speakers.

2.15 LED Strobe Light

Provide low-voltage Strobe Light as noted on drawings. This low-voltage Strobe Light shall be 48 VDC.

2.16 Pushbuttons

Provide Pushbuttons as noted on drawings. Used for Alert acknowledgement, Emergency Alert or Doorbells. Can be a Normally Open (NO) pushbutton wired by a 2 conductor wire back to a Peripheral device or ATX Controller as noted on the drawings.

2.17 System Diagnostics

- A. All active components in the system shall be continuously supervised for both power and data to ensure proper operation and in the case of system faults to aid in troubleshooting.
- B. All faults shall be displayed immediately on the associated Communications Gateway.

Part 3—Execution

3.01 Supervision

Only factory trained installers shall install, service, and maintain the specified system.

3.02 Rough Openings

- A. The Phoenix G2 ATX Station Alerting Controller only requires a rough opening if mounted exposed in a 19” rack cabinet. The ATX is normally surface wall mounted.
- B. Room Remote 2 (RR2) – For Flush mount option a 4 Gang Box using a rough opening of 2 ¾ “ H x 7 3/8” W. Surface mount application a back box is sold by USDD. **Installers must note on their**

station walk through if the RR2 will be a Surface or Flush mount application. Install Instructions can be provided on request. Maximum high side reach allowed shall be 64" AFF, typical height shall be +48" AFF. Room Remote 2 (RR2) has it's own installed doc and will be provided to the installer.

Color Indicator Remote (CIR) – For Flush/Wall mount a standard 4 Gang box is used. If installing into drop ceiling tiles a Bogen TB8 Tile Bridge and 4 Gang box will need to be used. Install instructions can be provided on request.

- C. Provide access hatches in finished drywall ceiling areas where access is restricted to devices mounted above ceiling.

3.03 Wiring

- A. All peripheral network cables terminate on patch panel located in the Station Controller Cabinet and on a single telecommunications outlet on the peripheral end.
Use RJ-45 Data Connectors. **NOTE: DO NOT USE EZ-RJ45 Style Connectors due to it causes poor data connectivity and shorting in the connection point.**
- B. All speaker cabling shall be Plenum rated 18 gauge, 4 conductor stranded, jacketed cable. 2 conductors GRN/WHT for Audio speaker portion and 2 conductors Red/BLK for LED lighted speaker portion.
18 gauge, 2 conductor stranded jacketed cable can be used just for the Audio portion or just for the LED portion. Plenum rated 18-4 cable is preferred to use due to possible future expansion of speaker types and just pulling one type of cable. Speaker runs that home run back to Station Controller cabinet will noted on plans.
- C. Contractor shall terminate all four (4) pairs of Category 6 cable on manufacturer-approved connectors, and shall test and certify all connections to Cat 6 standards. Provide all cabling test certifications after testing.
- D. All wiring shall be free from shorts and faults. Wiring shall be UL listed, NEC and NFPA 70, Article 25 approved.
- E. Message Sign cabling to Message Remote shall be 6 conductors flat "silver satin" type cable or equivalent. Terminate both ends with 6 conductor modular plugs utilizing straight thru wiring (DO NOT turn over conductors). Message Sign to Message Remote cabling shall not be longer than 25 feet to observe proper serial operation.
- F. Message Remote with speakers attached will need an 8ohm/70V transformer inline with the Audio connection only, wire to the LED Lights is separate. Transformer plate will indicate where wire connects to the device and speaker. For a Room Remote 2 (RR2) the speaker audio and LED lights will be connected on the backside of the device, no 8ohm/70V transformer is needed with a RR2.
- G. Gamma Signs will have one CAT6 cable run from ATX Controller POE ports to the Gamma Sign terminated on both ends with RJ-45 Data connectors. These signs can be daisy-chained from one to another with CAT6 cables terminated with RJ-45 Data connectors.
- H. Label both ends of all network cabling and the Station Controller Cabinet end of all speaker and lighting cables. Label patch panels in the Station Controller location.

3.04 Outlet Boxes and Conduit

General – Provide pull string in all empty conduit installed in this section. Label conduit ends with conduit usage when practical.

- A. Message Remote – In suspended ceiling locations, provide 4" metal J-box with mud ring, as indicated, above finished ceiling. Stub up 3/4" empty conduit from each Message Remote J-box to nearest accessible ceiling, cable tray, or other location as shown. In hard ceiling locations, locate J-box at nearest accessible ceiling location.

Provide 4" metal J-box with duplex mud ring as indicated for each associated message sign at +7'6" AFF typical (+13' AFF for apparatus bay). Center J-box above doorways and align with other architectural features as directed. Orient mud ring opening horizontally. Provide 3/4" empty conduit

between the Message Remote J-box and each of the associated message sign J-boxes (maximum of two). Provide duplex stainless steel J-box covers with 3/4" dia. hole centered in the cover with a Heyco #2840 bushing for all junction boxes.

- B. Double-sided Message Remote – Provide 4" metal J-box with mud ring, as indicated, on wall behind sign mounting location. Stub up 3/4" empty conduit from J-box to nearest accessible ceiling, cable tray, or other location as shown. Provide suitable mounting (3/4" plywood typical) behind drywall surface for mounting Double-sided Message Remote bracket. **NOTE: The mounting bracket must support the entire weight of the Message Remote and attached signs.**
- C. Gamma Signs – Can be mounted in a dual configuration in Apparatus bays. They will mount to Articulating Arm mounts on adapter plates. Mount the Articulating Arm mount + 9.5' AFF where devices are indicated on the plan. Inside the building and in any room, mount the signs on the provide brackets 1' down from the ceiling. Provide a 1 gang box with a plate cover (that has a hole in the center for the CAT6 POE cable to pass thru) this box will be installed behind the sign.
- D. Room Remote 2 (RR2) – Provide a 4 Gang Steel or Plastic Box, the opening of these boxes should be at least 2 3/4" H x 7 3/8" W don't exceed these dimensions, measure boxes to be certain. 3/4" empty conduit from the Box to nearest accessible ceiling, cable tray, or as shown on drawings. Box opening to be located +48" AFF typical and no more than +64" AFF.
- E. Ceiling Speakers (Hard Ceiling) – Provide Bogen RE84 Ceiling Speaker Enclosures in all hard ceiling applications. Provide 3/4" empty conduit to enclosure and run to nearest accessible ceiling location, cable tray or equipment as shown. Conduit shall also be used to interconnect with other enclosures as shown on construction drawings.
- F. Ceiling Speakers (Suspended Ceiling) – Provide Bogen TB8 Ceiling tile Bridge as appropriate for specified speakers. Provide RE84 ceiling speaker enclosures as required by specifying engineer or client.
- G. Apparatus Bay and Outside Speakers – Provide 4" metal J-box with mud ring and cover at each speaker location with 3/4" empty conduit to Message Remote or other location as indicated. Provide a 3/4" dia. hole centered in the J-box cover with a Heyco #2840 bushing to allow speaker cable to run to speaker. Apparatus bay speakers are typically located +13' to +15' AFF, outside speakers are typically located +11' AFF. Other heights as noted on drawings.

3.05 Speakers

- A. Ceiling Speakers (Suspended Ceiling) – Install Bogen S86T725PG8W speakers through ceiling tiles and tile bridge per manufacturer's specifications. Connect speakers to Room Remotes and Message Remotes as shown. If noted for a 8 ohm speaker systems require that the 70 volt transformer be bypassed by the installer. All 8 ohm speakers shall be installed using parallel or series/parallel connections with no less than 4 ohms impedance. Otherwise connected the 70V speaker to it's corresponding audio wattage setting for 1 watt 70V system.
- B. Ceiling Speakers (Hard Ceiling) – Install Bogen S86T725PG8W speakers into enclosures and connect to Room Remotes or Message Remotes as shown.
- C. Apparatus Bay Speakers – Install Bogen NEAR A2T speakers on walls or structures per the manufacturer's specifications. Connect speakers to ATX Controller, External Amplifiers or Message Remotes amplifier via cable in conduit as shown. Dress cabling neatly to minimize visibility.
- D. Exterior Speakers – Install Bogen NEAR A2T speakers to structure per manufacturer's specifications. Connect speakers to correct Message Remote amplifier as shown. Provide Bogen model ASTB4 cable boot and install drip loop in cable prior to entry into J-box. Seal entry using appropriate sealant.

3.06 Equipment Mounting

All equipment mounted to drywall shall use appropriate fasteners and drywall anchors. Equipment shall not be directly screwed into drywall using unapproved fasteners such as drywall or wood screws. Must

use Toggle bolts when hanging the ATX Controller/Expansion Module to the wall surface. If securing it to wood use proper size lag bolts to support 50lbs or greater.

3.07 Electrical Power Connections

- A. It shall be the responsibility of other trades to provide the appropriate number of dedicated 120 VAC, 20A duplex outlets into the equipment cabinet rough opening. This power feed shall not have any other devices connected directly to it and shall be labeled "Station Alerting". This electrical circuit shall be connected to the fire station's emergency power system for automatic power provision during loss of utility power.
- B. Connect all system power supplies and equipment cabinets to a common earth ground utilizing a 14 AWG, or larger, solid conductor which is at minimum the same conductor size as the AC feed wires.

3.08 Environmental Protection

Make certain that all central equipment is accessible for service. Contractor shall notify specifying authority if designated equipment closet does not meet manufacturer's requirements for heat, radiation or static electricity.

3.09 Connections to Other Equipment

- A. Lighting Controller (optional) – Connect low voltage dry contact lighting controls (provided by others) to Room Remote, Message Remote or ATU outputs. Low voltage outputs are non-inductive load, 24VDC 1A maximum. Provide an interposing relay or contactor between the low voltage output and any 120/277 VAC lighting or other load.
- B. Local Area Network (optional) - Connect the Fire Station Controller to the general purpose LAN (provided by others) located in the Fire Station. This connection shall be connected back to the central Communications Gateway to allow alerting commands to be sent from the Communications Gateway to the Fire Station Controller. In addition, the connection shall allow remote diagnostics and configuration.
- C. Radio System (optional) – Connect Audio Input #1 to the dispatch voice radio system (provided by others) as necessary to provide dispatch audio. This connection shall provide a 600 ohm impedance 0 dBm level signal.
- D. Telephone System Intercom (optional) – Connect Audio Input #3 to an Intercom output from the building telephone system (provided by others). This line shall be provided via a jack box located directly adjacent to the Station Alerting system equipment.
- E. Other Audio Source (optional) – Connect Audio Input #4 to an audio source (provided by others). This line shall be provided via a jack box located directly adjacent to the Station Alerting system equipment.
- F. Telephone System Ringdown (optional) – Connect the Ring Detector input to a telephone line (provided by others) for telephone ringing and backup alerting. This line shall be provided via a jack box located directly adjacent to the Station Alerting equipment.
- G. Connections to other customer- or contractor-provided equipment shall be made using approved methods for the type of connection. Contact manufacturer for unusual applications.

3.10 Drawings

Provide as-built drawings of all installed components and associated wiring on building plans.

