DISPATCH CONSOLE REQUIREMENTS

1 OVERVIEW OF DISPATCH CONSOLES

1.1 INTRODUCTION

The purpose of this document is to provide the dispatch console requirements of the Union County Georgia E-911 Dispatcher Center facilities located in Blairsville, GA. The center provides dispatch services for:

- Blairsville Police Department
- Union County Sheriff's Office
- Union County Fire Department
- Union County Schools Police Department
- State , Local and Federal Agencies
- Union County EMS
- Union County EMA

A new Dispatch Console System shall be proposed that employs a state-of-the-art IP network architecture with GUI-based operator positions. The operator positions shall be "user friendly", highly reliable, and incorporate radio control in a manner that shall provide for efficient and simple operation for the dispatchers and department personnel in any combination of configurations and functions available. The proposed system shall provide all of the necessary functions to control and monitor the existing analog radio system. As the County is planning a radio system modernization, the proposed system shall support a direct IP interface and be fully compatible with new radio technology which is anticipated to be a NEXEDGE digital conventional radio system manufactured by JVC Kenwood.

The proposer shall state how the dispatch console can assist in the migration from analog radio technology to digital radio technology and promote interoperability during the migration so that critical services will be maintained.

1.2 DESCRIPTION OF SYSTEMS

1.2.1 ANALOG RADIO SYSTEM

Tone remote- Baker Audio radio and phone console combined 5 Kenwood Base Stations,

1.2.2 DISPATCH CONSOLE SYSTEM

Existing System: 3 consoles

New System- 3 consoles- 1 laptop

2 DISPATCH CONSOLE FUNCTIONAL REQUIREMENTS

The console system shall be designed to enhance the dispatchers' ability to communicate effectively with field personnel, perform resource management tasks and to minimize the effort and concentration required for efficient use and control of the radio system with the capability to advance to a trunked system. This shall in part, be accomplished through the use of high quality, LCD monitors for selecting dedicated channel and talk group control windows representing all base stations, repeaters, talk groups, alert paging and auxiliary functions at each console.

1. To minimize operator confusion and the chance of errors being made, all channels, talkgroups and individual ID's shall be referred to and displayed by alphanumeric names. Numeric only references for talkgroup or channel names shall not be acceptable. Manually cross-referencing a channel name to a number shall not be acceptable for any dispatch operation.

2. It is desired that all control functions displayed be configurable so that they can be organized on the console screen in the most efficient and flexible manner possible. The use of printed, paste-on and/or snap-on, mechanically engraved labels is specifically excluded under this specification.

3. The proposed system shall be capable of deploying configuration changes to the Console Positions over the network and take effect immediately without restarting system elements. Solutions that require each system element to be separately administered are not acceptable due to maintainability issues.

4. Each console position shall be capable of enabling user authentication to provide security as well as free seating of console operators. The free seating feature shall allow console operators to log in at any console position and receive their associated configuration.

5. The console configurations shall be comprised of a combination of audio resources, controls, and informational resource graphics. The audio resource graphics shall support a minimum of two lines of text to easily identify the resource. Resource status shall be displayed separately from the name using both color and text. The following status indications shall be supported; select, unselect, patch, monitor, hold, busy and mute. There shall be different status colors to identify the following conditions; select, unselect, patch, monitor, hold, and mute.

6. Each audio resource shall have an individual volume setting for the select state and the unselect state. This volume level shall be retained when toggling the endpoint between different states and have an administrator configurable minimum level to prevent muting entirely. The volume level shall only affect a single console position.

7. Each audio resource shall have an indicator window for visual identification of activity. The indicator window shall be yellow when receive audio is present and shall be red during active transmit.

8. The system shall support the display of multiple programmable 12/24-hour clocks, a master PTT status bar, and VU meter.

9. Mouse operation shall be used to select and use all dispatch functions. Touch screens shall not be required.

10. Dual headset jacks shall be provided at each console operator position. The jacks shall provide TX and RX audio and PTT as well as telephone support. Each set of jacks shall be equipped with its own volume control.

2.1 Console System Reliability

1. Due to the critical nature of the services provided by the County, a high degree of console system reliability is required. The console positions shall contain two Ethernet connectors to support redundant network connections for enhanced reliability.

2. A high degree of modularity is required to reduce the number of sub-systems affected by a single component failure. The ability to repair, reprogram or replace sub-systems without impacting dispatch operations shall be provided and discussed in the proposal, as continued console operation is necessary during repairs.

3. Proposers shall recommend the spare modules and parts needed to promptly restore the console system to full service following potential sub-system failures. These costs shall be included in the overall system's recommended spare parts listing to be provided in the Pricing Section of the proposal.

4. The console system shall be equipped with system diagnostics and alarm notification capability. A diagnostic and event logger shall be available to centrally correlate alarms, events, and activity within the proposed system. The output of the logger shall be viewable in a dashboard to provide context on alarm and system activity.

5. The diagnostic logger shall denote the date/time of an event, the source component of the alarm or event, the alarm type, such as "Alarm" or "Event," display the status of the event and include the severity of each such as Major or Minor for Alarms, and Low or High for system event anomalies.

6. The diagnostics logger shall contain a "system view" that provides a snapshot of the system's networked components. Pertinent information shall be provided for each component, allowing a quick way to check system health.

7. The logger shall also be capable of publishing alarms and anomaly events to an external management system using industry standard Simple Network Management Protocol (SNMP). Example: Email Lt or 911 Director of alarms in system.

8. New arriving alarms shall be indicated on selected console positions with visual and audible alerts identifying console system issues and failures.

2.2 Console Operator Position Functionality

Proposers should review the desired features listed below and provide a response to each numbered item indicating if the functionality is provided in the proposed dispatch solution.

1. **Console Position PC Equipment** – Each of the radio dispatch consoles shall provide all controls that apply to the various audio resources and auxiliary functions for the console. Operator positions shall be PC based, utilizing modern, commercial-off-the-shelf (COTS) hardware and operating system software in current production at the time the system is staged in order to help provide long service and system life. The PC shall be equipped with a keyboard and mouse, and an LED display with a minimum 21" diagonal measurement screen. The provided PC shall contain a dual NIC interface to support redundant network connections for enhance reliability. The proposal shall identify the proposed operating system and provide a description of the PC equipment proposed for the project. Proposers shall state whether the console hardware may be optionally supplied by the County and disclose any additional fees for so doing.

2. **Console IP Media Processor** – Each of the radio dispatch consoles shall be equipped with an IP Media Processor. To ensure proper audio quality, designs using PC soundcards for media processing shall not be acceptable. A dedicated hardware or software-based IP media processor shall be provided to perform audio processing, management, and presentation. A PC-based console utilizing an internal sound card for media processing is not an acceptable solution due to limited number of channels, inconsistent audio performance, and long-term maintainability issues.

   The IP media processor must be configurable to support interfaces for select and up to ten unselect speakers, a maximum of four microphone devices (headset or desk microphones), and a footswitch. Audio port assignment must be software configurable via administrator software and downloaded to the console position. All control and level settings must be digitally set; potentiometers which require manual adjustments are not acceptable.

Audio peripherals shall be connected to the IP media processor using industry standard RJ45 locking connectors to prevent accidental disconnection. All peripheral device connections shall be made via standard Ethernet patch cables utilizing RJ45 connectors for easy replacement. The media processor shall contain a dual NIC interface to support redundant network connections for enhanced reliability. Additionally, four Form C relays shall provide workstation state indications to external display devices.

3. **User login accounts** – Each operator position and supervisory position shall require a valid user login and security password to access the console system and its capabilities. Proposers shall describe their various levels of access and system security capabilities.

4. **Resource Select** – Each audio resource shall be capable of independent selection by the dispatcher. The resource icon shall provide a visual indication when the corresponding channel is selected and when that resource is transmitting or receiving. A receive volume level display shall be provided for each resource. The proposer shall describe how the system will arbitrate PTT requests from the console positions for the same audio resource and what notification is provided to the dispatcher.

5. **Select Speaker** – A select speaker shall provide audio from the selected audio resource(s). The speaker shall be an individual, desk top unit with a single cable providing audio and power from the IP media processor. The speaker shall have a volume control that ranges from silent to full volume. The speaker shall be equipped with a minimum volume détente to prevent full audio muting. The speaker shall provide a multi-colored LED to indicate power and receive audio activity indications.

6. **Unselect Speaker** – An unselect speaker shall provide audio from unselected audio resource(s). The speaker shall be an individual, desk top unit with a single cable providing audio and power from the IP media processor. The speaker shall have a volume control that ranges from silent to full volume. The speaker shall be equipped with a minimum volume detector to prevent audio muting. The speaker shall provide a multi-colored LED to indicate power and receive audio activity indications.

7. **Transmit Function** – A color-coded transmit general push-to-talk (PTT) function shall be provided to control the selected transmitter(s) and/or talkgroup(s). The PTT function shall be capable of being enabled by a PTT button on the headset, a PTT control on the LCD display, and by a foot switch at the position. As stated elsewhere in these specifications, for training and management purposes two headset jacks shall be included with each operator position, each of which shall operate identically.

8. **Station Channel Selection** – Controls shall be provided for all conventional channel interfaces for selecting different frequencies (modes) for a given conventional station. To minimize screen clutter, a centralized frequency select control shall be provided enabling an operator to select any one of up to ninety-nine (99) frequencies available. The frequency select control will automatically show the Selected radio name and the available frequencies associated with that respective radio. Selection of a frequency on the tool shall update the frequency on the Select radio endpoint and shall be reflected on the audio resource icon on all parallel consoles.

9. **Frequency Alias** – The console shall support a frequency alias function that provides an alphanumeric label on a per station/per channel basis. There shall not be a limit to the number of alias tables available and these tables can be assigned to more than one radio channel if so deemed appropriate. Aliases must be maintained in a single, common database accessible from all consoles. Aliases must support a minimum length of no less than sixteen characters.

10. **PTT ID Display** – The system shall be capable of decoding and displaying the individual radio subscriber identifier (PTT ID). The PTT ID information shall appear on the association audio resource icon as well as in the radio call queue, and activity history list. If the PTT ID has been assigned an alphanumeric alias, the call queue and/or activity history displays shall provide the alias information. Aliases must be maintained in a single, common database accessible from all consoles. Aliases must support a minimum length of no

less than sixteen characters. In the event of an emergency call, both the PTT ID and the alias shall be displayed in red.

11. **Console Clock** – A console clock shall display time in a twelve or twenty-four hour format (user selectable) at each operator position. It shall be possible to synchronize the time of day clock to an external time source using industry standard Network Time Protocol method.

12. **VU Meter**– A Volume Unit (VU) meter shall display and provide in the form a VU bar graph that depicts the measured audio amplitude of outbound audio from the dispatcher's console position. This module shall be configurable for size and may be located anywhere on the operator's screen.

13. **Keypad** – The console shall contain a keypad or screen representation of a keypad for numeric data entry.

14. **Microphone** – A high-quality desktop microphone shall be provided.

15. **Channel Cross Patch** – This function shall allow cross-patching audio resources to permit intercommunications. As participants are added or deleted, there shall be no variation in audio levels or quality. All patched audio shall be digitally processed. Dispatch Consoles must have the capability to patch between:

    a. Any digital talkgroup and one or more other digital talkgroups;

    b. One or more digital talkgroups and one or more conventional channels;

    c. Any conventional channel and one or more other conventional channels;

    d. The NENA desk set audio and one or more conventional channels;

    e. The NENA desk set audio and one or more digital talkgroups.

    Proposers shall state the number of resources that may be included in a single patch. There shall be two types of console patches:

    a. Hard – permanently pre-programmed patches, which the dispatcher cannot modify. Active hard patches must be displayed to the console operators through the console workstation GUI, but the console operator must not have the capability to knock down the patch. The patch shall be presented to the operator as two separate channels engaged in a patch, as a single patched channel, or both. Resources may be added to or removed from an existing hard patch only by modifying the pre-programmed patch at the system manager level, and not by the dispatch console operator.

    b. Soft – temporary patch created and controlled at the console level, which may be activated or deactivated from the console. Resources may be added to or removed from an existing soft patch at any time by the dispatch console operator.

16. **Group Call** – The console system shall support group calls on any talkgroups programmed into the system, with appropriate management approvals.

17. **Broadcast Calls** – The console system shall support announcements on any broadcast groups programmed into the system, with appropriate management approvals.

18. **Emergency Calls** – The console system shall support emergency calls from any user radio programmed into the system, with appropriate management approvals. Emergency calls shall be easily distinguished from regular calls with audible and visual notifications that are different from regular group calls.

19. **All Mute –** All console positions shall provide a one button "All Mute" function that will temporarily mute or un-mute all unselected radio traffic audio to that position. An adjustable time-out-timer shall automatically cancel the all mute function after a pre-determined time has elapsed. When active, the ALL MUTE function control shall be flashed to alert the dispatcher operator of a mute condition.

20. **Simultaneous Select –** A control shall be provided that allows the operator to manually select audio resources for simultaneous transmissions. Dispatcher transmit audio and control functions shall be sent to all selected resources simultaneously.

21. **Instant Transmit Function** – Each operator position (including Supervisors) shall provide an instant transmit function which will allow the dispatcher to quickly key up a radio resource by depressing the instant transmit control.

22. **Alert Tones –** Control(s) shall be provided at each operator position (including Supervisors) to initiate alert tones on the selected radio resources. Each control shall be settings for frequency, duration, and level. When activated, the associated tone will be applied to all selected endpoints and will be indicated on the VU bar graph. Proposers shall describe the alert tones that are available with their proposed solution.

23. **Cross Mute** – Consoles shall include a cross mute feature, which precludes voice communication from a dispatcher's microphone being repeated over loudspeakers at other consoles in the dispatch center.

24. **Supervisory Control** – The supervisors' consoles shall provide takeover control to prevent other dispatch consoles from keying repeaters or base stations for each channel supported by parallel consoles. Supervisory consoles shall be capable of overriding transmissions from other consoles.

25. **NENA 911 Radio/Telephone Headset** – The console system shall be compliant with the National Emergency Number Association NENA-STA-028.2-2018 Generic Standards for E9-1-1 PSAP Intelligent Workstation Equipment and enable the dispatcher to use the headset used to operate radio resources to answer calls on the 911 telephone system. The proposer will describe the headset sharing capability of the proposed system.

26. **Footswitch** – Each of the console operator positions shall be equipped with a footswitch. The footswitch shall be heavy duty and shall be designed so as not to skid on a smooth flooring surface.

27. **Emergency Channel Marker** – A low volume tone pulsed at defined intervals must be available to indicate that the radio resource is handling emergency traffic. The tone must be easily distinguishable from other tones used for other functions. The tone shall be automatically transmitted on the resource at a preset interval. Inbound or outbound audio activity on the resource shall temporarily interrupt the channel marker tone. The resource shall visually indicate the channel marker on all console positions. Any console shall be able to terminate the

channel marker. The tone's frequency, level, duration and interval shall be software configurable.

28. **Paging Tone** – The console system shall be equipped an integrated paging tone generator. The console shall be capable of two types of forms of paging configured paging and manual paging. Proposer will describe the paging capabilities of the proposed system.

    The system shall provide paging controls integrated into each console position supporting all formats below. Stacking and steering of pages as well as one-touch paging stacks shall be supported. When possible, paging tones shall be produced in the RoIP radio controller to ensure fidelity when low bit-rate CODECs are used.

    When stacks of pages are sent, the system shall have a configuration to allow alert tones to be played either at the end of the stack, or after every page in the stack. When pages in a stack are going to more than one endpoint, the system shall allow the sending of those pages to be in parallel, reducing the total paging time.

    Preconfigured paging controls shall allow the dispatcher to automatically page a contact or group of contacts (for example, a pre-defined paging stack) with one button click. Auto contact pads shall be configurable to utilize radio resources/frequency steering.

Paging Formats	
Format	**Call Sequence**
Reach Two Tone	Reach Slow Reach Fast Reach Group Call Two Tone Individual Call Tone & Voice Group Call Tone Only Battery Save
Reach Single Tone	Reach Slow Reach Fast Reach Group Call Two Tone Reach Single Tone Battery Save
Avcall 2 + 2 (SELCAL)	Unit Call GE Type 99
General Electric	
Plectron Single Tone Duotone Fast Duotone Slow Motorola	Individual Call
DTMF	Individual Call Group Call

Paging Formats	
Format	**Call Sequence**
5/6 Tone	Unit Call
Knox	Tone Only
Customized	Individual Call Group Call

29. **Instant Recall Recorder (IRR)** – Each console position shall be equipped with an integrated recall recorder capable of recording receive audio for all active (unselect and select states) resources at a given operator's console position. The IRR display shall provide date/time stamp for each call, endpoint identification and PTT ID, call status (emergency or normal) and state of resource when call received (select, unselect 1-10).

    To maximize screen efficiency and real estate, the Instant Recall Recorder operator controls shall be incorporated into the call activity history display. To conserve console position space, no additional hardware to support IRR is permitted. The operator shall have, at a minimum, the ability to select a call from the history window, fast forward and reverse through a call, pause a call, and advance to the next or previous instance of activity on an endpoint. IRR playback shall pause automatically when PTT is initiated at the console.

    The IRR shall be capable of recording and replaying audio on a per resource basis for maximum intelligibility. Designs that mix audio from multiple resources in a single select or unselect channel for recording and replaying are not acceptable. Recording retention time shall be configurable for up to 24 hours.

30. **Console Intercom** – The system shall support inter-console Intercom capability to and from another console position. The intercom shall provide a way to place a call to an operator position with an emergency level notification. The emergency intercom call shall be configurable to be placed into the call queue and play an emergency alert on the called console. The ability to place emergency intercom calls shall be configurable on a per-console basis.

    The intercom shall provide a way to alert a called operator position that didn't answer the intercom call. The indication shall be visual and optionally audible, show which operator position placed the missed call, and remain until the missed call is returned.

31. **Console Monitoring** – The system shall provide a Console Monitor capability for designated supervisor console positions. When configured, this function shall allow the supervisor's console to activate the function and select one or more other consoles to monitor. While activated, the monitoring console shall hear all conversations in the monitored console's selected endpoints. Multiple supervisor consoles shall be able to monitor a single console.