COMPUTER BASED RADIO DISPATCH CONSOLE SPECIFICATIONS

In addition to the GENERAL REQUIREMENT DOCUMENT, the following are required and / or desired features of the Computer based Radio System. Vendors shall reprint each required and / or desired functional feature with their proposal response. For each described feature, the proposal shall provide a response compliance code. The response compliance code shall be inserted in bold-faced type after each requirement. Response codes which warrant narrative explanation shall be followed by the appropriate narrative as prepared by the vendor. Complete substantive narrative answers are required. Non-specific answers or blanks may be considered unresponsive. Vendors shall use the following response codes in preparing their answers to these desired and required attributes.

Response Code Meaning:

"C" **C**omply – The proposed solution will fully meet this requirement because it currently exists as a standard feature or function in the base application software.

"S" **S**urpasses - The proposed solution surpasses this requirement because it offers additional features, functions, or enhancements to that required by the attribute statement and as thoroughly explained in the narrative.

"D" **D**oes not comply – The proposed solution does not fully comply with this requirement. The vendor will not meet this requirement in its entirety.

"T" Available through a **T**hird party – This requirement can be met by a software module that the vendor has arranged to use through a third party contract. The unit of software or software module must be designed for seamless integration with the base application software. Vendor's existing product costs for the separate unit of software or module are included and clearly identified in cost quotation

"CS" **C**ustomize – The requirement can be met by altering the proposed software to meet the requirements and specifications. Costs for customizing software are included and clearly identified in cost quotation. Vendor also must commit to completion of any custom software as part of the initial installation.

"EX" Explanation – Response requires an answer to a question rather than a stated requirement. Example, "What language is the application written in?" Vendor should use the "EX" code and provide answers following the desired or required feature.

1. REQUIREMENTS

1.1 SCOPE

These specifications define the minimum requirements and standards for a Communications Control Console and related accessories for the CROCKETT COUNTY EMERGENCY COMMUNICATIONS PUBLIC SAFETY ANSWERING POINT.

1.2 QUALITY

Proposed equipment shall meet or exceed industry standards for quality and reliability. All materials, parts, assemblies, etc. shall be new, and be free of corrosion, blemishes or other cosmetic defects. Design and construction shall be consistent with current best engineering practices, and shall be manufactured in the United States.

1.3 CERTIFICATIONS

All equipment proposed shall be certified to Part 15, Subpart "J" and, as applicable, Part 68 of the Federal Communications Commission (FCC) rules for Class "A" computing devices.

1.4 WARRANTY

Bidder shall warranty all equipment to be free from defects in material and workmanship, and to operate in accordance with these specifications for a period of not less than one (1) year from date of Installation. Options

for three (3) and five (5) of additional warranty including parts and labor will be provided. Hourly rates for time and materials will be provided if additional warranty is not selected.

1.5 REPLACEMENT PART AVAILABILITY

The manufacture of the proposed console equipment shall maintain of complete stock of repair components for the system for a period of not less than seven (7) years after initial delivery. These parts shall be available for shipment on an expedited basis 24 hours a day, 365 days a year including weekends and holidays. On site spare parts for essential operations shall be quoted as OPTIONAL.

1.6 DOCUMENTATION

Complete documentation shall be provided with the system. Each console system shall include, at a minimum, manuals that address the following functions or activities:

- Installation
- Service
- Programming
- Operation

The manuals shall be printed in black ink on 8.5" x 11" white paper utilizing at least a 10-point type font. The individual manual sheets shall be fastened together with a comb-binding, three-ring binder, or other similar positive binding mechanism.

2. SYSTEM REQUIREMENTS

2.1 SYSTEM ARCHITECTURE

2.1.1 Console System

The console system shall be comprised of one or more PC-based operator positions and a common controller (also referred to as "back-room electronics" or "common electronics bank") capable of expansion of up to 48 channels (audio for radio and phone).

2.1.2 Operating Position

Each operating position shall be comprised of:

A 19" rack mountable or desktop audio panel with select and unselect speakers, system control buttons, audio level controls, VU meter, and paging encoder keypad. Refer to Section 2.4 for additional requirements for operator accessories.

PC-based consoles shall have the capability of utilizing auxiliary button panels in the event monitors fail, with a maximum of 60 buttons for status and/or control. One (1) panel or buttons required per position, the OPTIONAL price of each additional panel. An audio panel is required at each position.

A PC operating under Windows® 2000 or Windows® XP Professional, executing a Windows 2000-compatible software application for control of the audio panel and common controller. Clock speed, random access memory, and mass storage requirements for the computer shall be as follows:

Attribute	Minimum Requirement
Operating System	XP Professional Service Pack 2 or Windows VISTA
CPU	Intel Pentium 2-GHz processor or equivalent x86 class processor
Hard Drive	1 GB of free hard drive space
RAM	512 MB memory or OS recommendation; whichever is higher
Motherboard Slots	2 full-size PCI available after basic configuration

Video	Video card, capable of 1024x768 minimum screen resolution and 16-bit color depth
Network I/F	Network Interface Card
Serial I/O	1 port
CD-ROM	12 x CD-ROM (for installation only)
Mouse Port	Standard PC
Keyboard	Standard PC

Optional: extenders for monitor, keyboard, and mouse from the Equipment room to the Dispatch console. Approx. – 100 feet.

A 19" LCD monitor is required per position. The monitor shall present a graphical representation of channel, menu, and system resource icons that may be activated by mouse.

2.1.3 Common Controller

The common controller shall be comprised of one or more 19" rack mounted card cages containing modular plug-in cards for system control, radio/telephone/intercom interface, console interface, auxiliary I/O and cross-channel patching. Either digital or analog switching architectures shall be acceptable under this specification provided that hum, noise, and cross-talk are at least -50 dB below the desired audio at full output. To ensure long term continued support, common controllers based on "off-the-shelf" commercially available card cages, modules or cards are prohibited.

2.1.4 Position Remoting

The common controller shall be capable of being remotely located up to 2000 feet (cable-run length) from the operator positions. In the event that additional separation is required, the system shall be capable of utilizing modems and leased lines, high-speed data networks (VoIP), or microwave links to extend the separation without intrinsic limitations on distance.

2.2 SYSTEM REDUNDANCY

2.2.1 Common Controller Redundancy

The console system shall be configured such that no single point of failure shall completely disable the common controller.

The disabling of a no more than one operating position and two radio channels as a result of a single point failure is permissible under this specification.

Acceptable redundant architectures include but are not limited to:

- Dual redundant power supplies and system controllers with automatic switch-over
- "Standby controller" architectures based on two completely independent, electrically isolated, mirror-image common electronic units with automatic switching between the units in the event of a malfunction.
- A separate stand-alone console at one operating position that is paralleled with the primary console system's common controller.

2.2.2 Operating Position Control Redundancy

Control of an operating position shall be possible using mouse inputs at the computer monitor or with button controls at the audio panel as backup if monitors fail.

In the event that the computer monitor at any operating position fails, it shall be possible for the operator to continue performing the following functions, if programmed, on the selected channel(s) using the audio panel controls and indicators:

- Monitor incoming calls on selected and unselected channels
- Transmit pages, voice and alert tones on selected channel(s)
- Determine appropriate voice levels during transmitting

- Send periodic priority marker tones
- Select other channels or groups of channels
- Respond to calls on other channels through the use of a “last call transmit” feature.
- Mute all unselected channels for a timed period
- Determine current time

2.3 MAINTAINABILITY

2.3.1 Remote Diagnostics

The common controller shall include provisions for remote monitoring of system diagnostics via a dial-up modem.

2.3.2 Hot Swapping

The system shall support “hot swapping”, i.e. allow removal of any card from the common electronics unit for repair or replacement without the need to power the system down.

2.3.3 Adjustments

All primary adjustments on common controller cards shall be readily accessible without the need for card removal.

2.3.4 Miscellaneous

All components, test points, and critical areas of the card(s) shall be clearly identified with silk-screened labeling on the printed circuit board.

2.4 APPLICATION SPECIFIC SYSTEM REQUIREMENTS

KEY ATTRIBUTES OF THE CONSOLE SYSTEM SHALL BE AS DEFINED IN PARAGRAPHS 2.4.X BELOW:

2.4.1 Quantity/Type of Operator Positions:

Qty __2__ with option for third console position

Type __MOUSE DRIVEN_____

2.4.2 Base or Control Station Interface Requirements

Tone _14 __ DC _14 __ (need capable of both)

System must be capable to connect to P25 standards for future expansion.

2.4.3 Number of Phone Lines

Qty _____

2.4.4 Number of Door Intercom Positions

Qty_____

2.4.5 Auxiliary Control Input/Output Lines:

Inputs _8__ (Opto-isolated — 48 max))

Inputs _8__ (Non-opto-isolated — 192 max)

Outputs _8__ (72 max)

2.4.6 Paging Controls:

Number of single button paging controls required ___

2.4.7 Analog Paging Formats

Option for simul-select for all channel broadcast

DTMF

Two-Tone Standard (Mot. or GE)

2.4.8 ANI (Automatic Number Identification)

Formats/Qty Channels Required: 4

FSK (MDC-1200) __2___

FleetSync® __2__

2.4.9 Operator Accessories

Tel/Radio Headset Interface - Duel

Desk-Mic

2.4.10 Power Requirements

Vendor may make recommendation based on system being bid, but all components must have a 1 hour minimum battery backup.

Primary Power	Secondary Power
120 VAC	UPS - ___1___ hour capacity
120 VAC	12 VDC Battery Backup - ___1__ hour capacity

2.4.11 Spares:

Spare cards and or interfaces shall be required to maintain redundancy during emergency replacement.

2.5 CONSOLE SYSTEM ELECTRICAL REQUIREMENTS

The console system shall meet or exceed the following electrical specifications:

2.5.1 TRANSMIT ELECTRICAL SPECIFICATIONS

Audio Output:	+10 dBm max. into 600-ohm line
Output Impedance:	Transmit: 600 ohm balanced. Idle: 600 or 3500 ohm
Distortion:	<2% at full output. Signal-to-noise > 50 dB. Hum, Cross-Talk all –50 dB at full output
Microphone Input:	-65 dBm for full output
Headset Input:	-20 dBm for full output
Page/Spare Input:	-15 dBm, not compressed
Freq. Response:	-3 to +1 dB from 250 - 3400Hz. (Excluding guard tone notch)
Compression:	Input level increase of 30 dB above knee of compression causes <3 dB output increase

2.5.2 RECEIVE ELECTRICAL SPECIFICATIONS

Input Impedance:	600 or 10K ohm (4-wire)/3500 ohm (2-wire)
Line Balance:	66 dB at 1000Hz
Rx Sensitivity:	-30 dBm max at knee of compression: adjustable
Freq. Response:	-3 to +1 dB from 250-5000 Hz (except guard tone notch)
Compression:	Input level increase of 30 dB above knee of compression causes < 3 dB output increase
Distortion:	< 2%
Call Light Sensitivity:	Programmable between -18 dB and -32 dB below knee of compression
Audio Output:	5 watts into 4 ohms at each speaker
Mute:	Programmable from 0 to -50 dB. “All-mute” time programmable from 1 sec. to infinity

2.5.3 AUXILIARY INPUT/OUTPUT ELECTRICAL SPECIFICATIONS

2.5.3.1 RELAY OUTPUTS

Relay Contact Current:	1.0 A
Isolation Voltage:	50 volts with respect to system ground and between contacts

2.5.3.2 OPTICALLY ISOLATED INPUTS

"On" Current Range:	+5 to +25 mA
"Off" Current Range:	-25 to +2 mA
Max. Positive Current:	+15 mA continuous, +40 mA peak2
Max Negative Current:	-25 mA continous, -40 mA peak
ESR:	405 ohms plus 0.7 VDC forward voltage drop
Isolation Voltage:	50 volts with respect to system ground

2.5.3.3 NON-ISOLATED INPUTS

"On" Voltage Range:	+3.5 to +30 volts
"Off" Voltage Range:	-30 to +0.9 volts
Equiv. Parallel Res:	5 kohms pulled to +8.5 volts

2.6 SYSTEM EXPANSION

The proposed system shall be expandable to accommodate a total of 16 operator positions and 48 radio channels.

3. INTERFACE AND CONTROL REQUIREMENTS

3.1 RADIO CONTROL PROTOCOLS

The dispatch console shall be capable of interfacing with and controlling the following communications devices: base stations; control stations; repeaters; intercoms; telephone lines; and public address systems using 2, 4, or 6 wire connections.

3.1.1 Tone Control

The console shall be capable of generating, on a channel by channel basis, all 15 EIA standard control tones. These tones shall be programmable by the end user in software. The range of the tones shall be between 650-2050 Hz with provisions for altering the Guard Tone frequency from its nominal value of 2175 Hz. The duration of the High Level Guard Tone shall be adjustable between 100 and 790 milliseconds in 10 millisecond steps. Function Tone Duration shall be 40 milliseconds. The tone frequency accuracy shall be +/- 0.2%, and timing accuracy shall be +/- 1.0%. Guard Tone frequencies may be software programmable to: 2100, 2175, 2300, 2325, 2600, 2800, or 2970.

3.1.2 DC Control

The console shall also be capable of generating, on a channel by channel basis, EIA standard DC control currents. The currents shall be programmable between +15mA and –15mA in 2.5mA increments. The console shall also be capable of producing currents of +/- 5.5mA, +/- 6mA, +/- 11mA, and +/- 15.5mA. The accuracy of the control currents shall be +/- 0.25 mA.

3.2 TRUNKING PROTOCOLS

3.2.1 Standard VHF and UHV connections required radio traffic.

3.2.2 APCO Project 25 CAI (Common Air Interface) Operation (MUST BE CAPABLE FOR FUTURE EXPANSION)

The console shall be capable of controlling APCO Project 25 CAI compliant mobile radios directly from the console when used in a control-station mode. The following functions, as a minimum, shall be available from the console to control the radio(s): Zone Select, Group Select, Encryption Enable/Disable, Monitor Enable/Disable, Radio Wide Scan Enable/Disable, Scan Enable/Disable, Talk-Around Enable/Disable. Radio subscriber unit PTT (Caller) ID shall be displayed in decimal format, hexadecimal format or else in aliased alphanumeric format.

3.3 PARALLEL CONSOLE OPERATION W/ OTHER CONSOLES AND REMOTES

The console shall be capable of supporting "Line Operated Transmit Light" (LOTL) indications on both DC and

Tone controlled channels. When LOTL is configured and enabled, the console shall indicate to operator(s) when a paralleled remote or console is transmitting on that channel. This function shall be available on a per channel basis, and may be enabled or disabled as required.

3.4 CROSS-BUSY DISCRETES

The console shall be capable of providing cross-busy outputs and accepting cross-busy inputs on a channel by channel basis. The cross-busy connections shall support automatic muting of channels on the same or parallel positions when transmitting to prevent audio feedback from occurring. The cross-busy signals shall be capable of being routed to any or all of the channels in the system, or to another console.

3.5 PHONE LINE INTERFACE

The console system shall support interface with one or more analog (“POTS”) telephone lines for patching purposes. The console shall be compatible with lines terminated at a central office or at a local PBX fitted with an analog port. That portion of the console equipment that connects to the phone lines shall be compliant with FCC rules, Part 68. Standard telephone instrument functions, including DTMF dialing and hook-flash, shall be provided. Hands-free operation of a phone line must be supported.

3.6 AUXILIARY INTERFACES

The console system shall provide a maximum capacity of 72 relays for control of external electrical devices such as lights, doors, CCTV cameras, and intercoms. Relay contacts shall be rated for 50 VDC at 1.0 Amps. **System will be equipped for 16 at installation.**

The console system shall also provide inputs for a maximum of 48 optically isolated and a maximum of 192 non-optically isolated discretes.

3.7 TIME SYNC INPUT

Existing net clock is ESE. Please specify the type interface and quantity to connect the radio system for time sync.

3.8 REMOTE DIAGNOSTICS PORT

The console system shall support remote monitoring of system configuration settings and activities via a dial-up modem. Access to the diagnostic port shall be password protected.

3.9 LOGGING PRINTER PORT

The console system shall provide an interface to an external serial printer for the purposes of logging system configuration changes and any fault conditions that may occur.

3.10 LOGGING RECORDER OUTPUT

The console shall provide, on a channel by channel basis, logging recorder outputs. These signals shall present on a standard Type 66 punch block, providing the summed audio of both receive and transmit signals for that channel. Each output shall be presented at a 0 dBm level, 600 ohm, single-ended.

Additionally, one output per console shall be available for various combinations of select, unselect, and microphone audio.

3.11 AUXILIARY AUDIO AND CONTROL

Each console operating position shall provide a readily accessible means of interfacing to external audio-based devices commonly found in dispatch centers such as: instant recall (or call-check) recorders, encoders, decoders, etc. The following signals shall be available at each console position:

- Busy Out
- Select Audio Out
- Auxiliary Audio In
- Auxiliary Audio Common
- Auxiliary PTT In

- PTT Common
- Monitor In
- Monitor Common
- Combination Select/Unselect Audio Out

3.12 CONSOLE NETWORKING

Each console operating position shall support connection to a local area network using for the purposes of centralized configuration file maintenance. Network outages or file server failure shall not affect the essential functions of the console system. In the event that an operating position can not locate a required configuration file on a remote peer or server, it shall load a local copy maintained on its own hard drive. Any and all hardware required to connect to the user's network, if required, will be the responsibility of the bidding entity.

4.0 FUNCTIONAL REQUIREMENTS

4.1 CHANNEL CONTROL FUNCTIONS

The console shall provide the following system and channel control functions:

4.1.1 Transmit

Depressing and holding this key or clicking on the icon shall cause the console to transmit on all selected channels. When attempting to transmit on multiple selected channels, if any channel is busy or unavailable, this shall not prevent transmission on available channels. This function shall be paralleled with a foot operated PTT switch if the console is so equipped. (Note: Throughout the balance of this specification, the term "clicking" shall be interpreted to include both left-clicking with a mouse or trackball or touch activation if the console is equipped with a touchscreen monitor.)

4.1.2 Monitor

Depressing this key or clicking on this icon shall cause the selected channel to disable its coded squelch (CTCSS/DPL) thus allowing the user to monitor the channel for activity prior to transmitting.

4.1.3 Site Intercom

Depressing and holding this key or clicking on the icon shall allow the operator to communicate with selected remote base station sites without keying the radio transmitter.

4.1.4 Alert

Depressing this key or clicking on the icon shall cause an alert tone to be transmitted on the selected channel(s). The following alert tones shall be available:

- Steady Alert Tone
- Slow Siren
- Fast Siren
- Hi/Lo Warble
- Beeps

4.1.5 All Mute

Pressing the key or clicking on the icon shall cause all unselected channels in the console to mute (i.e. reduce audio level to a predetermined low value). Pressing/clicking this key/icon again shall cancel the mute function, and return all channels to their previous volume levels. The mute level and duration prior to automatic return to the original level(s) shall be user programmable.

4.1.6 Simultaneous Select

This key or icon shall allow the user to select more than one base station for transmitting at a time. This shall be accomplished by clicking on the "Simultaneous Select" icon and then, clicking the Channel icon(s) to choose the channels the user wishes to select. When the "Transmit" function is activated, the console shall key up all of the selected channels.

4.1.7 Group Select

Pressing this key or icon shall automatically select a pre-defined set of channels. Up to 16 separate Groups can be pre-programmed in software. Following this, when the “Transmit” function is activated, the console shall key up all of the selected channels. Canceling the function is accomplished by selecting any Single Channel buttons.

4.1.8 Patch Path

Depressing this key or icon shall allow the operator to set up multiple, simultaneous, independent patches at the same operator position. Pressing the key or clicking on the icon causes the Patch Path to increment upwards from 8, 10, 16, or 24 possible paths.

4.1.9 Patch

Depressing this key or icon shall allow the operator to turn on the Patch setup command. Clicking the channel icons with the patch on will place that channel onto the indicated Patch Path. Up to 48 Channels may be placed onto a single Patch Path. While channels are patched together, when one channel receives an incoming call, the other channel(s) on that Patch Path will transmit and rebroadcast the received audio. Clicking on a channel icon that is presently patched will “un-patch” that channel. Depressing this key or icon again will toggle off the Patch setup command.

4.1.10 Patch Clear

Depressing this key or icon shall allow the operator to take down the indicated Patch Path, thereby removing all associated channels from being patched together.

4.1.11 Patch Transmit

Depressing and holding this key or icon shall allow the operator to transmit on all of the channels patched on the selected patch Path of the console. The key shall allow the function to be performed only if there is no call activity on any of the patched channels

4.1.12 ANI Review

When the console is called by a field unit using ANI (Automatic Number Identification), the field unit’s identifier number shall be shown in channel icon. To sequentially review ANIs that were previously received, the operator shall repeatedly press the ANI Review key to scroll backwards through the stack. Each ANI will be shown in turn on the highlighted channel icon.

4.1.13 Priority Marker

Pressing this key or icon shall cause the console to transmit a brief tone over the radio channel every few seconds while the channel is idle. This function can be assigned to any and all channels in the system, on a channel-by-channel basis. The frequency, duration, interval, and amplitude of the Priority Marker shall be user adjustable in software.

4.2 SYSTEM CONTROL FUNCTIONS

4.2.1 Speaker/Headset

Pressing this key or icon shall cause the selected audio (and optionally the unselected audio) to be rerouted from the speaker to the headset or handset earpiece (if so equipped). Pressing the key again shall route the audio back to the speaker.

4.2.2 Last Call Transmit

Pressing and holding this key or icon shall cause the console to transmit on the channel that most recently experienced channel activity (i.e. received a call). This function shall occur regardless of which channel(s) are currently selected. If implemented as a physical key, the button will have an LED, colored red that will illuminate whenever the key is depressed.

4.2.3 Page Enter

This key shall be used to “stack” a group of pages such that when the “Page Send” key is pressed, the stack will be transmitted in the order the operator entered them. If implemented as a physical key, the button will have an LED, colored red that will illuminate whenever pages are stacked.

4.2.4 Page Clear

When pressed this key or icon shall clear all pending and/or transmitting pages that have been entered either as a single call or a stack.

4. 2.5 Page Safety
When this key is enabled via programming, no instant call pages shall be sent until this key is pressed. While the instant call pages are pending transmission, this key's red LED will be on.

4.2.6 Page Send
Pressing this key shall cause the current manually entered page or stack of pages to be transmitted through the selected channels.

4.2.7 Console Intercom Call
Pressing this icon will cause the called console to alert its operator by emitting a beep indicating that an intercom call is pending. There shall be one of these icons on the console for each operator position.

4.2.8 Console Intercom Talk
Pressing this key shall cause the microphone audio of the calling console to be routed to the called console, and vise versa.

4.2.9 Console Takeover
Pressing this icon will cause the associated console's buttons and functions to be disabled. One console takeover button shall be presented for each operator position in the system. Also, this function shall only be available from the supervisory console position

4.2.10 Group Instant Transmit
Pressing and holding this key or icon shall cause a pre-programmed group of channels to be transmitted on simultaneously. The system shall have a minimum of 16 icons optionally available at each position for this function.

4.2.11 Select
Pressing this key or icon shall cause the highlighted channel to be "selected". The audio of the selected channel shall be routed to the left-hand speaker and that channel shall be transmitted on in the event that the system "Transmit" key is activated.

4.2.12 Frequency Up or Down
Pressing a "Frequency Up" or "Frequency Down" button or icon shall cause the highlighted channel to increment the channel frequency select. The console shall accommodate up to 15 frequencies per channel.

4.2.13 Instant Transmit
Pressing and holding this key or icon shall cause the console to immediately begin transmitting on the highlighted channel without any need for changing the channel selection of the console

4.2.14 Volume Adjust
Toggling on the "Volume Adjust" key and turning the "Function" control knob on the Audio Panel shall allow the operator to adjust the highlighted channel's volume to a desired level. A numeric representation of the volume setting in percent shall appear in the channel icon.

4.2.15 Mute
Pressing this key shall cause the volume level of the highlighted channel to be reduced to a pre-programmed level. Pressing this key again shall cause the volume level to be restored to its previous level.

4.2.16 Volume Up
Each time the "Volume Up" key is pressed, volume of the highlighted channel shall increase and the console's display shall indicate the new volume level in percent.

4.2.17 Volume Down
Each time the "Volume Down" key is pressed, volume of the highlighted channel shall decrease and the channel icon shall indicate the new volume level in percent

4.2.18 Main/Standby
Pressing this key shall cause the system to switch to the highlighted channel's standby base station. Pressing the key again shall cause the main base station to be switched back on.

4.2.19 Answer/Hold
The Answer/Hold key is used to connect to a telephone line channel, and toggles the phone into the hold mode

after it is connected.

4.2.20 Phone Release
The Phone Release key is used to disconnect the phone line for a telephone line channel.

4.2.21 Hook-Flash
This key, used on telephone line channels (if so equipped), when pressed shall cause a hook-flash on the telephone line.

4.2.22 PL Up and Down
The PL Up and Down keys may be used to select the Private Line function of a tone channel.

4.2.23 Repeat On/Off
Pressing this key shall cause the repeater function of the transmitter to be disabled (if so equipped).

4.2.24 Self Repeat
Pressing this key shall cause the console to enable the repeat-patch between the base station's receiver and its transmitter.

4.2.25 Priority Transmit
This key is used to override other operator positions who are in a transmit mode on a particular channel. Pressing this key shall cause the transmitting position to "dump" the channel, and the originating position to then be in the transmitting mode.

4.2.26 Monitor A
Pressing the Monitor A key connects the highlighted channel's unselect audio to the Monitor A speaker.

4.2.26 Monitor B
Pressing the Monitor B key connects the highlighted channel's unselect audio to the Monitor B speaker.

4.2.27 Digital Voice Privacy Code
Pressing this command will activate the DVP mode on configured channels.

4.2.28 DVP Clear
De-activates DVP mode.

4.2.29 IRR Enable
The IRR Enable key allows the channel to be recorded when Transmit or Receive audio is present. If this key is not present, the function will default to always record the audio.

4.2.30 IRR Play
The IRR Play key is used to start playback of the current message stored in the Instant Recall Recorder of the highlighted channel.

4.2.31 IRR Prev
Pressing the IRR Previous key makes the next older message in the Instant Recall Recorder of the highlighted channel the current message.

4.2.32 IRR Reset
Pressing the IRR Reset key makes the most recent recorded message in the Instant Recall Recorder of the highlighted channel the current message.

4.2.33 Icom Review
Reviews the intercom calls that have been received on the intercom channel. If more than on intercom channel has been defined then the calls received on the highlighted intercom channel are reviewed.

4.2.34 Icom Select
Cycles through the defined intercoms (for the highlighted intercom channel if more than one intercom channel is defined) connecting the audio from the console to the intercom remote position.

4.2.35 Icom Talk
Opens the audio path for the operator to talk through the intercom to the remote speaker.

4.2.36 Door

Activates the second aux output assigned to current intercom. This aux output is usually used for opening a door.

4.2.37 Disable CAD

This button is only needed when the console has a CAD (Computer Aided Device) interface connected to it through a serial port. This button disables the CAD control over the console while allowing console activity messages to be sent to CAD. When this button is activated, a countdown timer is started and displayed in the system message area. The timer indicates the amount of time before the CAD-disable condition will be automatically removed.

4.2.38 CRT Mouse or Trackball Control

For systems with a touch screen, the mouse provides an alternate method of activating the system functions. For systems without a touch screen, the mouse provides primary control of system functions.

4.3 AUDIO ROUTING AND PRESENTATION

4.3.1 Receive Audio

The console shall route received audio from the “selected” channel(s) to the left-most speaker on the audio panel. The received audio from the remaining “unselected” channels shall be summed and presented at the right-most speaker on the audio panel. Each console operating position shall provide a means for the operator to direct one or more channels of unselected receive audio to up to two additional independent “monitor” speakers.

4.3.2 Transmit Audio

When the PTT key, PTT icon, or footswitch is activated, microphone audio shall be routed to the selected channel(s). Transmit audio shall be buffered and delayed for a period equal to the combined duration of the high level guard tone and function tone such that no clipping of syllables occurs if the operator begins speaking at the exact instant that PTT is activated. The release of the PTT at the end of the transmission shall be extended by an equal time period.

4.3.3 Integration of Telephone and Radio Dispatch Audio

The console system shall support a Telephone/Radio Headset Interface device that will allow the operator to use one headset for operating both an external telephone and the console.

The Telephone/Radio Headset Interface shall provide a standard “two-prong” type PJ7 jack for the headset to plug into, and shall be designed to mount under the tabletop/counter. The unit shall have independent volume controls for both radio and telephone.

When the telephone is “on-hook” (i.e. telephone not in use), the select audio of the console shall be routed to the earpiece of the headset. When PTT is depressed, the headset microphone audio shall be routed to the selected channel(s).

When an external telephone device connected to the unit is taken “off-hook” (i.e. placed in use), a contact closure from the telephone system shall cause the Telephone/Radio Headset Interface to route the select audio into the select speaker, and present the user with telephone audio in the earpiece. The microphone audio is routed to the telephone such that the user can converse with the caller in full duplex without the need to press the transmit button. However, when the user needs to answer a radio call on the console, activation of PTT shall cause the microphone audio to momentarily be routed to the select channel(s). This muting of transmitted audio to the telephone caller shall be switch/jumper selectable.

When the external telephone returns to an “on-hook” condition, the Telephone/Radio Headset Interface shall return the select audio to the headset earpiece.

It shall be possible to interface two Telephone/Radio Headset Interfaces to a console position to allow for training and supervision.

It shall be the responsibility of the bidding entity to ensure compatibility with the user’s telephone system and to provide any hardware and engineering required to interface the systems. PLEASE PROVIDE A LIST OF COMPATIBLE TELEPHONE SYSTEMS.

4.4 PAGING FUNCTIONS

The console shall be capable of supporting the following paging formats:

- Standard Motorola two tone format

The console shall provide the capability to initiate a page through manual entry of a paging format and cap-code, or via activation of a single icon or key ("single button paging"). The console shall provide a means for the system administrator to program one or several pages with differing formats and associate them with a single button or icon. Pages shall be automatically steered to the appropriate user-defined channel. During page transmission, the console shall provide visual and audio cues of the progress and status of the transmission.

The console system shall support a minimum of 1000 pages at each operating position arranged in a hierarchical structure for easy access by operators. The ability for the console to perform single button paging is a mandatory requirement. Consoles that only offer "call-up" or "paging table" lists that require the operator to scroll through calls to find the appropriate selection shall not be acceptable under this specification.

4.5 CROSS-CHANNEL PATCHING

Each of the channels or phone lines interfaced in the system shall be capable of being patched together. The console shall be capable of supporting up to eight (8) simultaneous, independent patches system-wide. In addition, any number of channels can be part of a patch. The console shall support directional switching of the patch using either COR input or VOX activation. Full duplex patching to telephone lines shall be supported.

4.6 AUTOMATIC NUMBER IDENTIFICATION (ANI)

For channels requiring Automatic Number Identification (ANI), also known as PTT-ID, the console shall be capable, on a channel by channel basis of decoding and displaying ANI and associating them with the channel that the ANI was received on. The console shall also be capable of storing a minimum of 6 ANI codes for later recall. The following ANI formats shall be supported:

- MDC-1200
- P25 (must be capable for future expansion)
- FleetSync®

The console must be capable of muting the received audible ANI data burst of MDC-1200, and FleetSync®, which shall not be presented to the speaker.

The console shall be capable of encoding the DTMF for signaling and acknowledgement. The system must be capable of supporting Full Feature MDC-1200 with Emergency Acknowledge.

For PC-based operator positions, the system shall be capable of supporting a "look-up table" for converting ANI codes to plain text. When a valid ANI code is received on a channel, the system will equate the ANI number to a name in the table and display that name in the appropriate location on the monitor. The names located in the table shall be field programmable via software and be capable of up to 10 characters per name.

4.7 AUXILIARY I/O CONTROL AND ALARM ANNUNCIATION

The console system shall provide auxiliary inputs and outputs at the common controller level (shared resources which may be accessed from any and all operating positions) and at the console operating position level (local resources accessible only to that position). The inputs and outputs shall be provided in the quantities specified in Section 2.4.6 and meet or exceed the electrical requirements specified in Section 2.5.3.

4.7.1 Common Controller Level Auxiliary I/O

Auxiliary outputs shall be user programmable for the following control modes: momentary on, toggle on/toggle off, and interlocked (i.e. activation of one output deactivates another).

Auxiliary inputs shall be user programmable to be interpreted/managed as alarms or as status inputs (e.g. light or door status). When one or more alarm inputs are activated, the alarms shall be queued in the order received and presented to the operator on the main screen. An alarm acknowledgement button or control shall be provided to acknowledge the alarm. When all alarms have been acknowledged, the alarm message display shall be blanked. The console system shall include provisions for programming a contact closure output when an alarm is acknowledged. Clearing an alarm at one position must clear the alarm at all positions.

Status of all auxiliary inputs shall be available to the operator without compromising the operator's ability to monitor and transmit on all channels presented on the main screen.

4.7.2 Console Operating Level Auxiliary I/O

Each operating position shall feature at least 8 inputs and 8 outputs that may be used for “local” auxiliary I/O and for interfacing with other equipment. The console shall be programmable such that any or all of the console inputs may be “bound” to any of the on-screen control functions (excluding a menu selection) on a one to one basis. In this manner, grounding of an input shall be equivalent to manual activation of an on-screen control icon.

Activation of a console output will allow control of peripheral apparatus (i.e. lights, doors). Activation of these outputs are console specific and can only be viewed and operated at the console.

4.8 PARALLEL STATUS

Any shared system resource (e.g. frequency/PL selection on a radio, repeater on/off, or common controller level auxiliary I/O) shall result in a status update visible at all console operating positions.

4.9 “PER CHANNEL” INSTANT RECALL RECORDER

The console shall be capable of providing a minimum of four (4) minutes of instant recall recording for any DC, Tone or Local channel in the system. Playback audio shall be presented in the selected speaker if the source channel is selected; otherwise presentation will occur in the unselect speaker. In the event that an incoming call occurs during playback, the playback operation will be terminated to avoid conflict. Controls for the IRR shall be presented on the video display or as buttons on the audio panel.

Proposals for two-channel instant recall recorders with one dedicated to the currently selected channel(s) and one dedicated to the unselected channels shall be deemed non-responsive.

4.9.1 TX Audio Delay

Tone, local and DC channels must be capable of up to four (4) seconds of Tx audio buffering for enhanced dispatch and patching operation.

4.10 CONSOLE TAKE-OVER

The console system shall include provisions that allow the supervisor’s console to inhibit transmit operations on a subordinate’s operating position.

4.11INTERCOM

The console system shall include provisions for position to position intercom operation.

The console system shall be capable of supporting two-way communications with up to 12 external door intercom points.

4.12 PROGRAMMABILITY

The console shall be capable of 100% field programmability. This shall be accomplished using console-programming software and cables supplied with the system and/or directly from a supervisory CRT based position if so equipped. The software shall be capable of execution on a Windows compatible computer. Any software, programming cables, and all manuals shall become the property of the end-user upon payment of final invoice.

5. USER INTERFACE REQUIREMENTS

The console shall provide operator controls and status information using the following mechanisms:

A video display with iconic representations of channel resources, control functions, and status displays. Control functions shall be activated by mouse.

An Audio Panel with manual volume controls for setting select/unselect audio levels, a 16 button keypad for input of paging codes, a keypad with a minimum of 16 programmable buttons for control functions, and an LCD display for presentation of time, audio levels, page entry, and transmit on indication.

5.1 VIDEO DISPLAY

The video display screen shall present controls and status information as defined in paragraphs 5.1.1 through 5.1.4 below. Either of the following screen organizations shall be permissible under this specification:

"Channel Control Module Style" – Controls are integrated into the channel icon to emulate a button-based channel control module

Separate Control and Channel Icons. – Controls operate on "pre-selected" or "in-focus" channel resources

Under no circumstances shall more than one control action be necessary to select a channel or to transmit on a channel.

5.1.1 Channel ID and Status Presentation

The main screen shall be capable of presenting the status of up to 36 channels simultaneously with selection status, call status, transmit status, patch status, and channel attributes (volume level, muting status, frequency, and PL settings) clearly indicated and associated with the appropriate channel. User-defined alphanumeric names shall appear in or adjacent to each channel icon to clearly identify each channel.

Channel resources and associated status shall be visible at all times and not be obscured by secondary menus or "pop-up" screens.

5.1.2 System Status Presentation

A "display-only" area of the screen shall present time, transmit status, system messages (e.g. diagnostics), and active alarms.

5.1.3 Control Function Presentation

A user defined subset of the system and channel control functions defined in Section 4.1 shall be available on the main screen. Primary controls (e.g. transmit, volume, mute, etc.) shall be visible at all times and not be obscured by secondary menus or "pop-up" screens.

5.1.4 ANI Presentation

The console system shall support PTT ID and Reverse Selective Calling (RSC). Receipt of an emergency PTT ID shall cause the console to sound a distinctive alert tone along with a presentation that allows the operator to determine which channel the call was received on. The console shall be programmable to unmute the channel upon receipt of a Reverse Selective Call.

Contact closure outputs will activate in support of RSC activity and emergency PTT ID to control external indicators.

When the channel receives ANI signaling, ANI digits shall be displayed in a field contained in or clearly associated with the corresponding channel icon. If the user has defined an alphanumeric alias for the numerical ANI code, the alias shall be displayed in lieu of the code

If more than one ANI entry is pending for a given channel, the presented ANI code or alias shall be distinctively presented to indicate to the operator that multiple calls are pending. A "Review ANI" button shall be available to review all pending of queued ANI codes if desired.

5.2 AUDIO PANEL

Each operator position shall feature a dedicated audio panel with controls to serve as a back-up in the event that the computer monitor fails. Proposals for systems that do not have a dedicated hardware audio panel with back-up controls shall be deemed non-responsive.

5.2.1 LCD Status Display

The Audio Panel shall include a backlit LCD display that presents time, audio levels, paging codes, and transmit on indication.

5.2.2 Function Key Pad

The Audio Panel shall include a function keypad with a minimum of 16 programmable keys to implement user selected functions from Section 4.1.

5.2.3 Paging Keypad

The Audio Panel shall include a 16 button paging keypad for manual entry of paging cap codes.

5.3 BUTTON PANEL

Each operator position shall be optionally capable of adding up to three button panels for direct button control of various functions.

The button panel(s) shall work in conjunction with the video display specified above, and shall be rack-mountable. The unit(s) shall conform to EIA RS-310-C “Racks, Panels and Associated Equipment”, and measure no greater than 5.25” high x 19” wide x 2” deep.

The button panel shall have a maximum 60 buttons that shall be capable of being programmed with system commands, instant call paging, or auxiliary functions. Each button shall feature two different colored LEDs for status indications. Each position shall be capable of a minimum of 3 of these panels. The button panel(s) shall derive their power directly from the audio panel.

5.4 CAD CONTROL

Each operator position shall be optionally capable of supporting Computer Aided Dispatch (CAD) functions.

5.5 COMMAND/STATUS TEXT

Each Command Key/Status Text must be able to be presented in standard ASCII text format, and optionally presented in French or Spanish text and be custom configurable at the user’s discretion.