ZETRON

DRAFT

Sonoma County Sheriff's Office

Statement of Work

12/22/2022
Sonoma County Sheriff's Office - Statement of Work

CONTENTS

1. GENERAL INFORMATION

This Statement of Work (or "SOW") and its accompanying appendices, if applicable, define the responsibilities of Zetron and its customer listed below during the construction of the Zetron Communications System (the "System") under the applicable system sales or other written agreement between Zetron, Customer, and any other contracting party ("Contract"). Tasks to be performed by others, if included in this document, are for informational purposes.

In all cases, the most recent SOW (by signatory reference) will be the actual document for the construction of the System.

1.1 Project Identification

Identifying Name	Sonoma County ACOM Console System
Project Number	TBD
Contracting Party	Sonoma County Sheriff's Office Sourcewell Member #20799
Customer End User	Sonoma County Sheriff's Office
Customer's Address (contracting party)	2796 Ventura Ave, Santa Rosa, CA 95403
Customer's Project Manag	Russe Holme Tecomr unications Mar ger
Purchasing Contract	Sou ewell #04202 -ZET
Shipping	F.O.B. Destination (ex. sales taxes, fees)
Change Order Procedure	Zetron change order form

1.2 Reference Documents and Contract Terms & Conditions in Order of Priority

- Sourcewell Contract #042021-ZET
- Zetron Terms and Conditions: https://www.zetron.com/wp-content/uploads/2021/01/terms_and_conditions.pdf
- This Statement of Work

1.3 Delivery Schedule

Zetron and its subcontractor(s), if applicable, shall create a delivery schedule that meets the delivery requirements under the Contract. If the Contract did not contain a written delivery schedule, the completed, written delivery schedule shall be incorporated into the Contract.

1.4 Interrelationships

Zetron reserves the right to use subcontracted services upon mutual agreement with Customer.

1.5 Equipment

Zetron will manufacture, configure, and test Common Control Equipment (CCE) and Operator Position Equipment (OPE) including the hardware and software identified in this section.

Using Customer's supplied IP Network, Supplier will provide the following:

Backroom equipment at the Sonoma County Dispatch Center consists of:

- Redundant Media Controller Service (MCS), Infrastructure Gateway (IG) server cluster and applicable software. The server clusters provide console management and control.
- 20 x P25 Digital Fixed Station Interface (DFSI) Talkpaths connections with Advanced Encryption Standard (AES) encryption in the ACOM core
- 32 x 4-wire E&M or Tone Remote Control (TRC) Analog Radio Interfaces (w/ MDC-1200) via 16 x dual-homed ACOM Radio Gateways (ARG)
- 50 x 4-wire E&M or Tone Remote Control (TRC) Analog Radio Interfaces via 25 x dual-homed ACOM Radio Gateways (ARG)
- 60 x SIP Logger Outputs
- 1 x ACOM Surveyor Network Management System (NMS) server for system configuration and operational monitoring and reporting.

Backroom equipment at the Sonoma County DR Site consists of:

- Non-redundant Media Controller Service (MCS), Infrastructure Gateway (IG) server cluster and applicable software. The server clusters provide console management and control.
- 20 x P25 DFSI Talkpaths connections with AES encryption in the ACOM core
- 32 x 4-wire E&M or Tone Remote Control (TRC) Analog Radio Interfaces (w/ MDC-1200) via 16 x dual-homed ACOM Radio Gateways (ARG) – same ARGs as provided for main dispatch center
- 50 x 4-wire E&M or Tone Remote Control (TRC) Analog Radio Interfaces via 25 x dual-homed ACOM Radio Gateways (ARG) – same ARGs as provided for main dispatch center.

A total of 28 x full-feature console positions are provided as part of the proposal. Each console consists of:

- 1 x Win10 PC workstation with a 23" Widescreen monitor
- 1 x ACOM Media Dock
- 4 x Zetron ACOM speakers with individual volume controls
- 2 x Headset Jackboxes (dual-prong interface with dual volume controls)
- 1 x Desktop Microphone with PTT
- 1 x PTT Footswitch
- 1 x ACOM Console Software (ACS) application with Pro Console license

A total of 2 x PC only console positions are also provided as part of the proposal. Each console consists of:

- 1 x Win10 PC workstation
- 1 x ACOM Console Software (ACS) application with Pro Console license

Zetron provided console system software including:

- Media Controller Service (MCS) and Infrastructure Gateway (IG) core controller software.
- ACOM Network Management System (NMS) software for configuration and operational monitoring and reporting.
- ACOM P25 DFSI interface software licenses.
- ACOM Console Software (ACS) for full feature operator console positions.

Notes:

1. All ACOM Radio Gateway (ARG) 12VDC power to be provided by Customer.
2. Headset with Push To Talk (PTT) to be provided by Customer.

3. All Local Area Network (LAN) switches for remote console sites, all LAN cabling/termination/testing, Network Time Protocol (NTP) time source and inter-site Internet Protocol (IP) networks, to be provided by Customer.
4. All cabinet to Main Distribution Frame (MDF) cabling, building modifications, etc., provided by Customer.

1.6 Services

Project Management (development of a Project Timeline and System Test Plan, Factory Acceptance Testing, documentation, and 1 year Gold Maintenance Service Plan), on-site training, and assistance with Customer's self-installation will be provided by Zetron.

Installation assistance will be completed in a single contiguous trip. Technical and Operator train-the-trainer training will be completed in a single contiguous trip. Expenses and labor incurred for additional trips requested or required by the customer will be billed through the change order process or billed separately.

1.7 Functionality

A fully redundant ACOM System with standard functionality shall be provided. The following functionality which Zetron has developed for other customers, shall be modified and imported into the baseline ACOM code to accommodate the specific requirements of Customer. Customer AID output to CAD will provide decoded MDC IDs with channel per the following functional definition:

AID System Interface

- The AID interface is used to pass received radio IDs to the CAD system,

Functionality

- The AID system logical interface consists of a single serial port connection. The serial port uses the RS232 electrical standard and runs at 9200 baud, 7 data bits, 1 stop bit, with even parity.

Hardware

- The ACOM console system will provide a CAD AID for the CAD AID system interface. The interface will operate identically to the current AID decoding device. To support redundancy, the single physical serial connection from the CAD system will be converted to IP using a Serial-to-Ethernet converter (Digi One SP or equivalent). This will allow multiple, redundant servers to communicate with the CAD using UDP messages via the IP network. Although both servers will receive the CAD messages only one server, the "preferred" server, will actually respond to the CAD system.

Customer has provided the current output from the existing Cimarron Decoders which shall be replaced by ACOM:
Format Type: MDC-1200
Output Type: Cimarron Standard
Define Serial Port Parameters: 9600-8-N-1
Channel: xx 01-07 SO; 11-14 REDCOM; 21-22 SRJC; 31-32 MADF

Output from newer model decoder using "CIMARRON STANDARD" - Works for CAD
00009505 ANI ID 00:00:00 00/01/00 CH 06
00009505 ANI ID 00:00:00 00/01/00 CH 06
00000224 EMRGENCY 00:00:00 00/01/00 CH 06
00000224 EMRGENCY 00:00:00 00/01/00 CH 06
00000224 EMRGENCY 00:00:00 00/01/00 CH 06

1.8 Customer-Supplied Equipment

Any Customer-supplied equipment must be in working order and sent in its entirety, unless mutually agreed, to Zetron's facility at Customer's expense to enable Zetron to integrate said equipment into the System.

1.9 Project Management

Project Management is an ongoing activity required of all parties for successful integration of the equipment. Zetron will assign a primary project manager ("Zetron Project Manager") who will manage the project. All Zetron subcontractors will report to the Zetron Project Manager, who will in turn liaise with Customer. Customer will be required to provide a project manager to act as a single point of contact for the implementation of this SOW. Project managers will be responsible for contract administration, scheduling, and monitoring progress of the assigned deliverables of their respective organizations. Formal communications must be channeled through the project managers. Formal communications are not to be routed directly between subcontractors and Customer, except as otherwise specifically stated in the Contract.

1.10 Project Kick-Off Meeting

A project kick-off meeting (virtual or onsite) will be scheduled before System manufacture begins. This meeting is a working session, which uses the Contract, Statement of Work, and other pertinent documents as the basis for fully developing the implementation plan.

Contract clarification and project change order procedures will be addressed and a formal process will be implemented for communicating any and all information that clarifies the Contract.

The implementation schedule will be clarified during the meeting. At the conclusion of the meeting all tasks will be clearly defined, with all parties understanding what is expected of them.

1.11 Project Planning

Zetron will prepare a project plan that defines the management processes, procedures, and project timeline that will be followed to deliver the System and Services described in the Contract. The project plan is an internal document and will include a description of the support services to be provided by Zetron. The project plan may be submitted to Customer. The project plan will be used to guide all of Zetron's activities and to monitor and track Zetron's progress against the timeline and milestones established in the plan. The project plan will include a discussion and details on the following major elements:

- Project scope (includes an overview, definitions and glossary, project summary, roles and responsibilities, etc.)
- Project management (includes approach, project organization, project manager and task leaders, Zetron design reviews, schedule, project meetings (person-to-person and remote via telephone), acceptance criteria, etc.)
- System deliverables (includes descriptions of equipment being provided and information on System requirements, etc.)
- Installation plans and schedule (includes information on the site survey, site installation plans, site preparation, and schedule for equipment deployment and installation)
- Testing and acceptance (includes testing, optimization, and the acceptance process, including implementing the acceptance test plan)
- Documentation and publications (includes a description of general requirements and a summary of documentation deliverables)
- Training (includes training plan, training course syllabi, and a description of recommended training materials)
- Support (includes warranty service and maintenance service plans following beneficial use of the System by Customer, which begins upon successful completion of the Site Acceptance Test (SAT))

1.12 Change Orders (Modifications)

Zetron and Customer shall follow Zetron's change order process unless otherwise mutually agreed.

1.13 Site Surveys

Zetron may survey the facilities where the equipment will be installed. The purpose of the survey is to provide information to Zetron of obvious site-specific requirements. It may include a meeting to discuss programmatic and technical issues such as:

- Schedules
- Milestones
- Zetron procedures

1.14 Preliminary Design Review (PDR)

A Preliminary Design Review (PDR) will be completed to capture the technical specifications of the design and when finalized and approved, serves as an authorization to proceed. The PDR is considered a "Pass" if the participants agree they have a reasonable approach to the System design and have obtained design consensus. It is possible that at this point there may still be some minor outstanding design issues to resolve.

1.15 User Interface

Zetron will work with Customer to design the Graphical User Interface (GUI) screen configurations for the System. Design efforts will take place at 30%, 60% and 100% completion of System design. At the conclusion of these efforts, GUI screen configuration must be reviewed and accepted by Customer before FAT can begin. Labor spent on changes to the screen configuration after 100% completion of System design will be billed through the change order process. Customer will designate a single point of contact for design development.

1.16 Integration of Systems

The System will not be enabled to interface with Customer's systems, other than the specific systems identified in Section 1.5.

1.17 Training

Train-the-Trainer operator training will be provided to ensure that the Customer can train all dispatch personnel to have a functional knowledge of the System operation. A technical and administrator training course will be provided onsite utilizing the installed console system. Refer to Section 3.7 for further details. The training plan will be mutually agreed between Customer and Zetron.

2. SITE ASSUMPTIONS AND CUSTOMER DELIVERABLES

2.1 Ethernet Connectivity

Ethernet connectivity at each site is required to facilitate communications across the Customer network, and the following quantity of CAT5e, pre-terminated Ethernet drops are required to facilitate communications across the network, with one end of the Ethernet drops being terminated into the appropriate port on the Customer provided Ethernet switch associated with the Customer communications network and the other end terminated in the areas identified below:

Sonoma County Dispatch Center Backroom

- 2 x dedicated Ethernet drops in the Intermediate Distribution Frame (IDF) or MDF closest to dispatch floor, terminated within 10' of the existing rack.

Sonoma County DR Site Backroom

- 2 x dedicated Ethernet drops in the IDF or MDF closest to dispatch floor, terminated within 10' of the existing rack.

Sonoma County Dispatch Center

- 48 x CAT5e to support 24 x Featured/Fixed Dispatch Positions.

The provisioning and configuration of up to 20 x P25 DFSI talkpaths from the P25 DFSI base stations with dedicated connections for the Customer communications network, with termination points adjacent to the ACOM cores at the backroom locations.

A dedicated Virtual Local Area Network (VLAN) or network segment on the Customer network, capable of the following characteristics:

- Logically isolated from any other network on a designated subnet solely for the use of Customer communications equipment.
- Capable of supporting a minimum of 62 hosts (/25).
- Capable of passing unicast and multicast traffic via varied TCP and UDP protocols between the following facilities:
  - Sonoma County Dispatch Center Backroom
  - Sonoma County DR Site Backroom

Capable of passing voice quality traffic, with appropriate QoS configuration to support up to 25 Mbps CIR bandwidth, with delay no greater than 50ms, packet loss of less than 0.5 percent, and jitter less than 30ms to all sites in the dedicated network.

Network devices throughout the network shall not remark traffic associated with the Customer communications network. All server infrastructure for the console communications system shall be physically located in the Server Farm located at Sonoma County dispatch center and DR site backrooms, shall require:

- 1 x 42U of space in a 19” cabinet for the servers, switches, hardware and management PCs at the dispatch center backroom.
- 1 x 42U of space in a 19” cabinet for the servers, switches, hardware and management PCs at the DR site backroom.
- At least four (4) Ethernet ports on Customer provided switches for connectivity of the Customer infrastructure switches to the remote radio infrastructure and radio dispatch positions.
- Two (2) independent and dedicated 20A, 120V power circuits on a UPS-protected power system with generator backup, with a twist-lock style plug or fixed hardwire connection at each of the 2 backrooms. Customer shall provide all 12VDC power for the ARG units.

2.2 Building/Construction Permits and Licenses

Customer is responsible for any permits, licenses, or applications for the site(s) where the System will be installed. Zetron will supply Customer with information regarding the System that is required to complete the permit and license applications. No engineering or licensed professional engineering certifications are included in Zetron’s proposal to Customer or the Contract, but if requested by Customer, these certifications may be provided as change orders. This includes, but is not limited to: electrical, heating, ventilation, cooling, plumbing, structural, environmental, and seismic.

Zetron has neither included in its proposal nor accepts any responsibility for changes in the SOW that might be required by any city, county or state permit approval agency and would impact either the permit application process or the actual work to be completed as outlined. Any such changes or upgrades of pre-existing conditions identified as required to meet current city, county, state or other applicable codes will be changes to the SOW and handled as change orders.

2.3 Authorizations

Customer must identify the person(s) with signatory authority for change orders, contract modifications, milestones, and payment authorizations.

2.4 Requests for Information

Customer shall provide information necessary for design of the System. This includes but is not limited to: floor layouts, furniture specifications, existing system interfaces & GUI, radio, administrative telephone, call groups, logger, digital I/Os, alarms, demarcation & punch block configuration.

2.5 Database Configuration Files

Customer is responsible for obtaining all current configurations used in their existing communication system that may be utilized in the System. The information includes but not limited to: paging tones and codes, radio groups and ID's, site locations and frequencies, individual signaling databases, alias, and speed dial.

2.6 Database Entry Requirements

Customer is responsible for creating large database files. Customer will provide staff to input databases in excess of 100 entries per file. The effort will include but not limited to: paging tones and codes, radio groups and ID's, site locations and frequencies, individual signaling databases, alias, and speed dial. Zetron will participate in the instruction process required to enable the Customer-assigned individual(s) to properly input the initial database entries or facilitate any importing of customer provided files or databases.

2.7 Database Accuracy

Customer is responsible for the accuracy of all database entries. This includes submitting accurate information for entry into the appropriate database. Prior to System cutover, Customer is responsible for verifying the data and testing the results, e.g., page each field unit to ensure the accuracy of the entries. An error report should be kept by the console operators for submitting error corrections to Customer's system administrator, dispatch supervisor, or a designated individual trained to update and correct each database, as an ongoing effort after the initial entry.

2.8 Site Preparatory Responsibilities

At the Customer facility, Customer shall provide a designated location for the installation of 28 (+2 PC only) dispatch positions.

- At the Customer Location: Sonoma County Dispatch, Customer shall provide a designated location for the installation of 22 dispatch positions (11 x Law, 10 x Fire/EMS, 1 x Equipment Room) (additional 2 PC only console positions shall be provided for maintenance purposes).
- At the Customer Location: Transit, Customer shall provide a designated location for the installation of 1 dispatch position.
- At the Customer Location: Central, Customer shall provide a designated location for the installation of 2 dispatch positions.
- At the Customer Location: JCD, Customer shall provide a designated location for the installation of 2 dispatch positions.
- At the Customer Location: Radio Shop, Customer shall provide a designated location for the installation of 1 dispatch position.

Customer is responsible for preparing the facility and/or radio infrastructure for installation of the System. This duty is Customer's, as they are responsible for maintaining the dispatch infrastructure. Items that are Customer's responsibility include, but are not limited to, installation of building wiring as needed, including all UPS, line protectors, line conditioners, and surge protectors, cross-connections to the network (e.g., E1 or T1 links between the center and the radio network, leased lines, T1 and/or 4W interfaces to connect remote operator positions and their audio streams to the CCE), Demarcation Line level specification testing and repair, radio and telephone interface wiring, cable pulls (e.g., between the CCE and console positions), furniture modifications and installation of custom monitor mounting, lighting, single point grounding, cabling from demarcation to the System.

Customer is responsible for confirming with Zetron cable type and cable run lengths to ensure specification compatibility. Customer must provide link testing results. Customer is responsible for confirming site readiness prior to deployment.

2.8.1 Site Deficiencies

Customer is responsible for correcting or having corrected at its expense all site deficiencies identified by Zetron or others.

2.8.2 Floor Layout

It is the responsibility of Customer to provide appropriate space to house Zetron's fixed equipment. No work will proceed without Customer's written approval of equipment placement.

A dedicated space on the wall of the communications room for the demarcation of System circuits is required with adequate space for required demarcation punch blocks. Customer must mount the split block type punch down block to the demarcation wall in preparation for System installation. For cable tray installation, the power and ground must be run separately from audio signals. Zetron recommends running all audio and signal cables in the overhead cable trays, away from the power and ground. The cable trays will need to be high enough to allow the System cabinets to sit underneath. The cable trays should provide a path for voice and signal cable routing between the System cabinets and the demarcation wall. If the room has a raised floor that allows for the routing of power and ground beneath the cabinet, then Zetron recommends using the raised floor space. If such space is utilized, Customer must provide appropriate access through the raised floor directly below the System cabinet footprint.

Marking and labeling demarcation, punch blocks and Customer-supplied cables are Customer's responsibility. Customer shall supply Zetron with information depicting demarcation and punch block location and marking.

2.8.3 Electrical

Customer must provide adequate electrical power. Customer will also provide all uninterruptible power supply (UPS) sources, and surge suppressors as required unless otherwise stated within this Contract. All of the equipment in the System has been designed to operate on 120VAC/60Hz commercial power. Customer must provide AC power for each console location and the fixed network equipment. All outlets for the consoles must be installed within six (6) feet of the proposed equipment installation locations.

Customer will have outlets for the Common Control Equipment cabinets installed as receptacles directly above or below the footprint of the cabinets. If Customer positions the outlets below, Customer will provide appropriate access through raised floors directly below the cabinet foot print. The exact number of receptacles required will be determined prior to PDR. Locking receptacles or fixed hardwire connection are the responsibility of Customer. If overhead locking receptacles are used for equipment power, it will be the responsibility of Customer to supply and install UL approved locking plugs for the multiple outlet AC surge protector power cords. Customer must confirm in writing that each of these circuits was tested and is currently ready for the Zetron installation by providing a signed report listing the results of testing. Zetron will not connect to any circuit deemed not suitable as outlined in the Zetron requirements' specifications. Zetron will not be responsible for correcting these deficiencies.

2.8.4 Grounding

A single-point terra firma ground connection will be required from Customer for electrical bonding and lightning protection in the Common Control Equipment room. This connection should be low impedance to terra firma ground (less than 5 Ohms), and have few, if any, wire bends to a grounding rod or building ground grid. Circuits must meet or exceed industry accepted standards.

Customer must confirm in writing that each of these circuits was tested and is currently ready for the Zetron installation and optimization. Zetron will not connect to any circuit deemed not suitable as outlined in the Zetron requirements' specifications. Zetron will not be responsible for correcting these deficiencies.

2.8.5 Fresh Air Ventilation, Heating, Air-Conditioning

Customer is responsible for building ventilation, heating, or air-conditioning at any equipment location. Adequate ventilation must be provided for CCE and for any furniture housing position hardware.

2.8.6 Remote Access

Customer will provide a means (per their security protocols) for remotely accessing the System for on-going technical support services. Customer may provide a VPN or other type of high-speed network access if mutually agreed by both parties.

2.8.7 Telephone and Radio Circuit Signal and Line Levels

Customer's radio audio circuits and dedicated telephone circuit (if applicable) must be tested by Customer for meeting or exceeding the demarcation parameters for the I/O specification needs of the System. Customer is responsible for adjusting or correcting line levels that exceed demarcation parameters. Customer must confirm in writing that each of these circuits was tested and is currently ready for the Zetron installation and optimization by providing a signed report listing the results of testing. Zetron will not connect to any circuit deemed not suitable for supporting the signal and level settings, as outlined in the Zetron requirements' specifications. Zetron will not be responsible for correcting these deficiencies.

2.9 Equipment Installation

Customer will be responsible for the following tasks as part of the installation process.

2.9.1 Installation Standards of Work

All equipment provided for each site and the installation techniques used for that equipment shall comply with industry quality standards, NEC, state ordinances and all local codes. These standards, codes, and ordinances are the measure by which Zetron defines a quality installation. The appearance of the overall installation should be neat and orderly, including cable runs, and where applicable, square, level, and plumb equipment is required.

Customer's project manager will be responsible for the compliance of these installation standards. The Zetron Project Manager may request a correction to any work not in accordance with these standards.

2.9.2 Qualified Personnel

Customer must provide trained and qualified installers and technicians subject to Zetron's approval for all aspects of this project. Customer shall ensure that each individual under its supervision who is performing any task associated with this project is educated in, and abides by, all applicable OSHA Rules and Guidelines at all times. Personnel not qualified for performing the services required will be replaced at the sole expense of Customer, and Customer shall immediately provide a qualified replacement. Customer shall be fully responsible for all regrouping costs and any penalty costs as a result of supplying unqualified personnel.

Only personnel that have been trained by Zetron, or that otherwise have been authorized by Zetron, or those directly supervised by such personnel, may perform installation of the System.

2.9.3 On-Site Secondary Project Management / Track Equipment Inventory

As part of the responsibility as on-site project manager, Customer will ensure that all hardware and software are received on time to meet the installation schedule. Customer must inventory the equipment as it arrives, and compare items received with a list supplied by Zetron. Equipment errors or product damage must be reported immediately to Zetron.

Customer shall notify the Zetron Project Manager of any equipment shortages, any anticipated installation slippage, and other concerns, as soon as they are identified.

2.9.4 Install Equipment

Customer will place and ground applicable CCE. Zetron will install console positions in Customer-provided furniture per standard cabling practices utilizing Zetron installation instructions. Zetron will power up and configure CCE. Upon completion of the fixed equipment installation, Zetron will check the System for proper operation.

2.9.5 Cables and Labels

All cables will be cut, terminated, and labeled with to/from information to clarify interconnection. Customer shall prepare as-built documentation clearly depicting the cable runs, punch-down block details, and interconnections. Customer shall provide and install all necessary cabling and connections not supplied by Zetron.

2.9.6 Integration of Systems

Customer will enable Zetron's consoles to interface with Customer's telephone and radio systems, as applicable.

2.9.7 Time Source

The Customer shall provide cabling, switching, or ports necessary to provide connectivity between the Customer's Network Time Protocol (NTP) source and the Zetron ACOM system.

2.9.8 Complete Termination of Sub-Systems

All equipment cables will be terminated as required.

2.9.9 Mounting Supplies

Customer will provide and install supplies as needed, such as mounting hardware, wire connectors, cable ties, and cable looming to implement a full and complete system. Customer will provide and install punch blocks, and custom mounting hardware such as seismic bracing hardware. Miscellaneous cables not typically associated with the System will be the responsibility of Customer.

2.9.10 Repair or Replace Defective Equipment

Customer will coordinate the disposition of defective equipment with Zetron's direction.

2.9.11 System Testing and Acceptance

Refer to Section 3.6.6, System Testing and Acceptance, for Customer's responsibilities.

2.9.12 System Documentation

Customer will be responsible for providing on-site "as built" documents, which will be supplied to the Zetron Project Manager for inclusion in Customer's installation manual.

2.9.13 Site Clean-up and Return of Shipping Containers

Customer is responsible for removal of all packing materials and debris. Should the System be shipped in reusable shipping containers the Customer will coordinate return of these containers with Zetron.

2.10 Facilities and Access

Customer shall provide the console furniture. Keys or on-site access to the equipment rooms and cabling installation areas are to be provided by Customer as required by Zetron. Normal access hours are to be negotiated between Customer and Zetron. If required by Zetron, Customer shall provide a secure room at the installation site with a dial-out phone during

the implementation phase of the project. This room will be used by Zetron onsite personnel for its operations; for temporarily storing System components and securing test equipment and tools; and as an office for the implementation team.

2.11 Interface Requirements

The cost for any unique interface requirement, whether or not identified in the site survey form, shall also be the responsibility of Customer.

2.12 Spares

Customer will maintain any purchased critical spares kit. Customer is responsible for coordinating the utilization of spares required for repair. Spares must be maintained in a controlled environment and protected from electrostatic discharge.

3. Zetron Deliverables

3.1 Project Management

Zetron will provide primary project management according to this SOW. In order to reduce the overall cost to Customer, this project management effort will be performed remotely.

3.2 Project Schedule

After receipt of the signed System Contract, or a purchase order, Zetron will present Customer with a project schedule for mutual discussion and agreement.

3.3 Qualified Personnel

Zetron will provide qualified personnel for installation assistance.

3.4 System Integration

Zetron will build, integrate, and test components at Zetron's facility prior to deployment at Customer's facilities. The System test configuration will be determined during the project-planning task. The System will be tested during the Factory Acceptance Test (FAT). Once the FAT has been successfully completed and approved by Customer, the System will be released for shipment.

3.5 Equipment Delivery

Zetron will arrange for delivery of all equipment to Customer as outlined in the established implementation plan. Warehousing of equipment will be the responsibility of Customer.

3.6 Installation Assist

Installation assistance includes the following tasks that may be performed by Zetron, a qualified subcontractor, or a combination of the two unless otherwise stated.

3.6.1 Equipment

Customer will place and ground applicable CCE. Zetron will install the applicable CCE. Zetron with Customer assistance shall install console positions in Customer-provided furniture per standard cabling practices utilizing Zetron installation instructions. Zetron will power up and configure CCE. Upon completion of the fixed equipment installation, Zetron will check the System for proper operation.

3.6.2 Cables and Labels

All cables will be labeled with a unique identifier. As-built documentation will be supplied with the equipment which allows complete cross reference of cable material, connectors, to/from information, and Zetron part numbers for replacement.

3.6.3 Complete Termination of Sub-System

All equipment cables will be terminated as required.

3.6.4 Load Application Parameters on all Equipment

Where applicable, the application software will be loaded, System parameters set, and features tested. The database will be programmed and the System operating parameters will be adjusted for Customer-specific requirements. Configuration files will be set up and verified as applicable for Customer-specific requirements.

3.6.5 Site Clean-up

All packing materials and debris will be handled as agreed. Decommissioning and removal/disposal of existing old equipment is the responsibility of Customer.

3.6.6 System Testing and Acceptance

Upon completion of the System installation, a visual inspection of the installation and the System Site Acceptance Test ("SAT") will be performed by a Zetron representative. It will be witnessed by Customer's project manager or their representative. Customer's approval of the SAT will serve as confirmation that the installation process was completed, and that Zetron has delivered [illegible]king Sy[illegible]

Each portion of the SAT will [illegible]e marked[illegible]s e[illegible]ner pas[illegible]d or f[illegible]ed. When [illegible]test point has [illegible]ssed, it will not be tested again. Failed test points will be [illegible]orrected[illegible]nd [illegible]hen [illegible]tested[illegible]orrec[illegible]ion/re-testing [illegible]rocess will take place on the repaired/replaced test point[illegible] until a[illegible] point[illegible] have p[illegible]ser[illegible]

For any portion of the test that cannot be completed due to circumstances outside the control of Zetron, Zetron reserves the right to alter that portion of the test, default to "passed", or mutually agree with Customer on an alternative approach.

3.7 Training

3.7.1 Technical Training

Note that technical training can be conducted at Zetron's facility and can be made available prior to System installation immediately following Factory Acceptance Testing. Technical training is most efficient, however, when given on-site using the actual installed equipment because physical location of components and final System configuration are key factors in maintaining the System. On-site technical training will comprise standard technical content, focused where possible to cover the configuration applicable to the audience. Training will cover function, installation (when Customer is providing the installation services), configuration, and maintenance of System equipment and software. Zetron will provide training materials in the form of standard product manuals and other handouts.

3.7.2 Operational Training

Classes are at Customer's location using the installed (but not live) equipment. Operational training covers basic System operation and communication tasks using the operating software. Train-the-trainer adds workshop-style training to ensure trainer-level understanding, including how to explain the System features and functions to trainee operator/dispatchers. Zetron will provide materials in the form of standard product manuals and other handouts in addition to electronic files of material used in class. Zetron only instructs on the operation/explanation of Zetron equipment, not on standard industry teaching practices.

3.7.3 Training Environment

On-site classes are taught at Customer's location(s).
For operational training, Zetron instructors bring a laptop PC and projector. Customer must provide a power source, writing surface (flipchart or whiteboard), and a projector screen or blank light-colored wall. Because operational training requires access to a configured, functional system and accompanying consoles, for an additional charge Zetron may be able to provide equipment for training at Customer's location.

The nature of on-site technical training may require that it be conducted in a blend of classroom and less formal environments, depending on access to Customer's actual installed equipment.

Factory classes are taught at Zetron's facility, in either a dedicated training environment on actual configured systems and consoles, or as part of FAT on Customer's actual equipment in a laboratory environment.

3.7.4 Training Materials

Training is conducted using lecture, live demonstration, and hands-on practice. Each attendee will receive copies of training materials used in class.

3.8 Manuals

3.8.1 Operation Manuals

The operator manuals will contain information, instructions, and procedures, accompanied by diagrams and on-line help files as appropriate, necessary to operate the System as delivered.

3.8.2 Installation and Maintenance Manuals

The installation and maintenance manuals will include the technical information necessary to install and maintain the System.

3.8.3 As-built Documentation

As built documentation will include System drawings and supporting information depicting the System configuration after installation.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

Executed by authorized representatives of the parties.

ZETRON, INC.	**CUSTOMER:**
BY	BY
PRINTED	PRINTED
TITLE	TITLE
DATE	DATE

EXHIBIT A:
PAYMENT SCHEDULE

	Total System Cost	$1,651,280.96	
	Sourcewell Discount	($165,128.10)	
	Total System Price	**$1,486,153**	
	PAYMENT MILESTONES		
1	Contract Execution	15%	$222,922.93
2	Factory Staging * Electronic notification from Zetron to Customer that Factory staging is successfully completed.	30%	$445,845.86
3	Shipment of Equipment to Customer * Electronic confirmation of shipment of equipment by Zetron	40%	$594,461.15
4	Equipment Installation * Electronic confirmation from Customer to Zetron that equipment installation tasks have been completed	10%	$148,615.29
5	System Acceptance * Co[illegible] of start[illegible] Benefic[illegible] Use of th[illegible]ystem by th[illegible] Customer	[illegible]%	[illegible]4,507.64
6	Zetr[illegible]n Gold M[illegible]inte[illegible]ance P[illegible]n Ye[illegible]1	[illegible]cluded in [illegible]se contract [illegible]rice	-
7	Zetron Gold Maintenance Plan Year 2		$97,386
8	Zetron Gold Maintenance Plan Year 3		$97,386
9	Zetron Gold Maintenance Plan Year 4		$97,386
10	Zetron Gold Maintenance Plan Year 5		$97,386
	TOTAL CONTRACT PRICE	**$1,875,697**	

1. Any delay caused by Customer will result in a day for day delay in the due date of all subsequent milestones.
2. The delivery schedule is subject to change by mutual agreement of the parties.
3. All dollars in this table are expressed as U.S. Dollars and are based on a total contract value equal to the Contract Price set forth above.
4. Taxes are not included in the above amounts. Invoice totals shall include any applicable taxes.
5. Payment is due Net 30 days.
6. Failure to make timely payment may cause delay in delivery of any subsequent delivery milestones.
7. If Customer delays 15 consecutive days or more, payment becomes due for the applicable milestone.
8. Extended Warranty & Maintenance services for Years 2-5 includes services as outlined in Exhibit B.

EXHIBIT B:
ZETRON GOLD MAINTENANCE SERVICE PLAN

Gold

Maintenance Service Plan

North America

ZETRON USA
PO Box 97004
Redmond, WA
98073-9704
USA

TEL 425 820 6363
FAX 425 820 7031

zetron@zetron.com
WWW.ZETRON.COM

TABLE OF CONTENTS

1. INTRODUCTION

This maintenance service plan ("MSP" or "Service Plan") describes the Gold-level support services Zetron will provide for hardware and software for the duration of the service period as described in Section 2.1. The support services are for "Zetron Products" and "Zetron Accessories". "Zetron Products" means products manufactured by Zetron. "Zetron Accessories" means personal computers, monitors and computer components, computer and audio peripherals, networking equipment and power supplies, all such items as sold by Zetron to customer and integrated as components of a Zetron communication system, excluding any third party software or firmware.

Existing project documentation and customer as-builts shall contain configuration-specific details of the Zetron system this MSP supports.

This MSP describes the capabilities of Zetron's US office in support of any applicable North American Zetron equipment installation. Zetron may use one or more of Zetron's qualified subcontractors to provide the services under this MSP.

Neither party shall be responsible for events beyond its reasonable control.

2. SCOPE

This MSP describes the support services Zetron provides. Section 3 describes Zetron's standard limited warranty. Section 4 describes the services included in this MSP including 24/7 technical telephone support, hardware maintenance, software maintenance and upgrades, third-party equipment repair facilitation, and factory onsite services. Section 5 describes additional services available on a quote-basis.

This MSP does not encompass change requests/enhancements that affect architecture, functionality, or performance, so hardware or software capabilities subsequently added to the Zetron system are not automatically covered. Such changes must be requested in writing to Zetron's Customer Fulfillment Project Management office. Upon approval by Zetron and implementation, these changes amend the established "as-built" system documentation and then fall under coverage of this MSP, at which point the monthly rate will be adjusted accordingly. Changes made to the Zetron system that are not reflected in Zetron's as-built documentation are not covered by the system warranty or this MSP.

2.1. COVERAGE PERIOD

This MSP is valid for the time period described in the quote sheet. The MSP may be extended by mutual agreement. If the customer wishes to purchase a MSP after a lapse in the services has occurred, the coverage must be paid up retroactively, for a fee equal to the fees that would have been paid had the coverage not lapsed.

2.2. THIRD-PARTY EQUIPMENT OR SOFTWARE

Zetron's standard System Terms and Conditions explain that third party manufacturers' warranties for any items (excluding Zetron Accessories) Zetron purchases and supplies for the customer's convenience shall transfer to the customer, subject to the limitations therein. Zetron's warranty does not apply to third party hardware (excluding Zetron Accessories), or third party software or firmware. However, the Gold MSP provides increased levels of third-party support. Refer to Section 4.5.

3. LIMITED WARRANTY

Zetron's System Limited Warranty is stated in the current version of Zetron's standard System Terms and Conditions, and is included during the term of the MSP. Certain specific services are included for the duration of the warranty period; refer to Section 4. For Zetron Products and Zetron Accessories, Zetron's standard warranty period is one year unless otherwise agreed in writing.

Warranties for Zetron Products under a MSP can be extended for a total warranty period of up to five (5) years, including the initial warranty period, and warranties for Zetron Accessories under a MSP can be extended for a total warranty period of up to three (3) years, including the initial warranty period.

4. SERVICE DESCRIPTIONS

The following sections describe the services included in the Gold MSP unless otherwise noted. The applicable spares package is a requirement for this MSP.

4.1. TECHNICAL TELEPHONE SUPPORT

Zetron telephone technical support exists in the form of factory Technical Support Engineers. This support is intended for technicians and system administrators installing, configuring, and maintaining Zetron equipment and software applications. 24-hour/7 days/week phone support is provided in accordance with the response times established in the following sections.

4.1.1. Calls During Standard Zetron Business Hours

During regular business hours, 6:00am to 5:00pm PT, calls to Zetron at (425) 820-6363 are answered by Zetron personnel who will establish a call ticket number, collect detailed issue information from the caller, and enter the call into the call queue.

Head of the queue and priority call back privileges are given to callers with Gold MSP above those with no agreements, Limited Warranty, and Silver MSPs. If the incoming call cannot be directed immediately to a Technical Support Engineer, 98% of the critical calls will be returned within 30 minutes, and 100% of the calls will be returned within 2 hours.

Zetron will work with the caller to make the determination whether calls involve critical or routine issues based both on system behavior and its affect on system operators.

Critical issues are those that have a major impact on the Zetron system operation as defined by

- loss of use of an redundant function
- loss of 10% of the positions; or
- loss of 10% of non-redundant channels or lines.

Routine issues are non-critical issues that have a minor impact on the Zetron system operation and range from routine maintenance operations to system behavioral inconsistencies to configuration issues.

Zetron observes the following holidays:

If a holiday falls on a Saturday, the holiday is observed on the preceding Friday and if a holiday falls on a Sunday, the holiday is observed on the following Monday.

	North America
January	New Year's
February	President's Day
May	Memorial Day
July	Independence Day
September	Labor Day
November	Thanksgiving and day after
December	Christmas 2-day seasonal holiday

4.1.2. After-Hours Critical Technical Telephone Support

Calls for critical issues to Zetron before 6:00am or after 5:00pm PT on any regular business day, at any time on weekends, or during Zetron-recognized holidays are considered after-hours calls. A Zetron qualified technical person will return calls for critical issues within thirty (30) minutes.

Zetron reserves the right during calls for critical issues after regular business hours to determine after an initial diagnosis whether the issue being reported is critical or routine, and thus whether it is to be handled immediately or deferred to the following business day. Routine issues will be deferred to the next business day. Scheduled system maintenance does not qualify as a critical issue.

4.2. HARDWARE SERVICES

4.2.1. Advance Replacement: First 90 Days

For the first 90 days after initial purchase of original equipment under Zetron's standard System Terms and Conditions, Zetron will provide advance replacement for critical Zetron Products and Zetron Accessories found to be dead-on-arrival or that Technical Support approves for replacement. Zetron bears all shipping costs for advance replacements.

4.2.2. Repair Defects in Materials or Workmanship

For the duration of the warranty period and the service coverage periods, for Zetron Products and Zetron Accessories, Zetron will provide parts and factory labor free of charge to resolve any material defects in material or workmanship as described in Zetron's standard System Terms and Conditions. Upon receipt of the defective unit and in accordance with Zetron's standard System Terms and Conditions while under warranty, Zetron's Repair Department reserves the right to determine whether to replace or repair a defective part, or whether to replace a product or refund its purchase price. If replacing a product, Zetron's Repair Department determines whether to provide refurbished service stock or new equipment based on repair turn-around and equipment availability.

No returns are authorized unless a Returned Materials Authorization (RMA) is issued by Zetron.

4.2.3. Repair Turn-Around

Zetron measures turn-around time from the date of receipt to the date of shipment from Zetron. This time does not include shipping or customs delays.

In the Gold MSP, repair turn-around is 2 business days. Products found to be not defective will be returned at the sender's expense, plus cost of a minimum of 1-hour testing and handling.

4.2.4. Refurbished Equipment

Refurbished equipment, to replace defective hardware, is available to be sold at 25% of product list price (75% discount).

Refurbished equipment will have guaranteed availability for selected, critical products for Gold MSP. The original defective hardware must be sent to Zetron and will not be returned to the customer upon repair.

Refurbished equipment is previously returned equipment that has been repaired and fully tested. It is available only for replacement of failed equipment. Refurbished equipment is based on equipment availability but select critical products have guaranteed availability for Gold MSP holders. Refurbished equipment will be shipped the same day.

4.2.5. Outgoing Shipping

Zetron will match the incoming shipment method when returning products. If the customer wants to expedite the outgoing shipment beyond the Zetron provided match, the customer bears responsibility for full shipment charges.

Shipping is always FOB Origin unless otherwise agreed by Zetron. The customer must pay all shipping and insurance charges when returning equipment to Zetron.

4.3. SOFTWARE SERVICES

4.3.1. Software Maintenance – Service Packs

For the duration of the MSP period, the customer is entitled to receive at no additional charge any patches or bug fixes contained in a service pack for Zetron feature group releases of the application or firmware version(s) sold as part of the original Zetron system. Patches/bug fixes in a service pack are specific corrections to defects found in previously released code (a.k.a. feature group) to ensure the code meets specification. Service packs add one-, two- or three-digit extensions on the previously released code number (for example, 2.11.12 indicates service pack 12 to version 2.11 software). All service packs will be incorporated in the next released software upgrade.

All Zetron software releases are subject to internal software release and design verification processes as well as standard configuration management practices. Service packs released may include patches/bug fixes and/or minor enhancements, but they should not affect system operation or performance.

Software maintenance for applications or code in certain systems will require customization and installation support (refer to Sections 4.4 and 4.6.6).

Note: For certain systems, the Software Installation/Upgrade Support service is required unless a pre-approved agent is available to provide this level of support.

4.3.2. Software Upgrades

For the duration of the MSP period, the customer is entitled to receive any software upgrade for Zetron feature group releases of the application or firmware version(s) sold as part of the original Zetron system. Software upgrades are released minor and/or major revisions to released software or firmware. Upgrades typically include minor enhancements as well as access to certain major new features. Upgrades also incorporate any previously released bug fixes/patches. Minor enhancements are functional performance improvements that do not require additional hardware or firmware to be specifically enabled or disabled. Major new features alter the software's specifications and may significantly affect system operation and performance and/or the look and feel of the user interface. Major features will be individually enabled or disabled as options; some options may require the additional purchase of hardware, firmware, or licensing.

Software upgrades incrementally change the previously released software or firmware version number by either preceding or following the first decimal point depending on the breadth of the changes incorporated. For example, software release 2.11 could upgrade to 2.12 to indicate relatively minor enhancements, or to 3.0 to indicate significant new features. In either case, all patches/bug fixes released in support of 2.11 would be included in the new release.

All Zetron software revisions are subject to internal software release and design verification processes as well as standard configuration management practices.

4.4. SOFTWARE UPGRADE CUSTOMIZATION ASSESSMENT

Due to the customization of certain deployed systems, software upgrade releases for these customized systems should be qualified prior to deployment. A factory-qualified engineer will complete an assessment of feature group upgrade releases against the functionality defined in a deployed system's factory acceptance test to ensure the new release will not adversely affect any deployed customer-specific custom configuration. Based on that assessment, Zetron will provide a quote of outstanding engineering customization; refer to Section 5.2. Assessments are available upon request and will be scheduled based on priority; emergencies will be given the highest priority of available resources.

4.5. THIRD-PARTY EQUIPMENT REPAIR FACILITATION

During the first three (3) years after original purchase of third party hardware (excluding Zetron Accessories) sold as part of the original Zetron system, and included in a specific customer agreement with Zetron, Zetron will facilitate resolution of issues on such equipment. To ensure the repaired unit's

compatibility with its already-deployed Zetron system, as applicable, Zetron will reconfigure repaired units against last-known configuration files on record before returning the unit to the field.

It is anticipated that third-party products have a useful life of up to three years.

4.6. FACTORY ONSITE SERVICES

Zetron will waive hourly or daily rates for up to 3 days per year of factory onsite services and cover 1 trip to customer's facility. These hours may be applied to technical support, training, equipment installation and programming optimization, or hardware preventive maintenance support. The Zetron factory-qualified instructor's or technician's travel time is not included in the up to 3 day amount and will not be charged to the customer. In all cases, travel affected by severe weather or natural disaster will be rescheduled.

Additional days, at then-applicable rates, may be purchased to accommodate additional factory onsite services. Hours may not be accumulated beyond one 12-month period.

4.6.1. Technical Support

A Zetron factory-qualified technician will provide onsite technical support to trouble-shoot and resolve issues Zetron is unable to resolve via telephone support. This service is limited to supporting the Zetron Products and Zetron Accessories that Zetron provides as part of the original Zetron system, and does not extend to other equipment co-existent with the Zetron system. Onsite visits will be scheduled based on priority; emergencies will be given the highest priority of available resources.

4.6.2. Technical Training

Technical classes are available for any of Zetron's system-level product lines. Some classes are conducted regularly at Zetron's factory; refer to the published schedule on Zetron's public-facing web site. Most classes can be made available onsite.

Technical classes include both operation and technical content, but focus on technical function, installation, configuration/programming, and maintenance of Zetron system and console equipment. Technical training is intended for electronic technicians and/or engineers and system administrators. Refer to each class course description for details.

4.6.3. Operation Training

Operation classes are available for any of Zetron's system-level product lines. These classes are not conducted at Zetron's factory independently of technical training, but rather are made available onsite.

Operation classes are geared for operators and dispatchers, the end-users of Zetron's systems. These classes cover basic system operation and communication. Refer to each class course description for details.

4.6.4. Operation Train-the-Trainer

Operation train-the-trainer classes are available for any of Zetron's system-level product lines. These classes are only available onsite.

Operation train-the-trainer classes enable end-users to train their own team members on system operation.

4.6.5. Preventive Hardware Maintenance

A Zetron factory-qualified technician will provide onsite assessment of installed, operational Zetron system equipment and recommend which items, if any, should be replaced. This applies to functioning equipment as well as spares. Components may include Zetron Products and Zetron Accessories. Through this service, recommended Zetron-manufactured replacement parts will be available at 50% of their published list price. This service does not apply to system expansion.

4.6.6. Software Installation/Upgrade Support

A Zetron factory-qualified technician will provide onsite software installation and configuration support for software maintenance or upgrade releases. This service is limited to supporting the applications Zetron provides, and does not extend to other system applications. This service is required for Acom software applications' maintenance and upgrade releases. This service is included in the Gold MSP and will be scheduled based on priority; emergencies will be given the highest priority of available resources.

5. ADDITIONAL SERVICES

The following services are available for an additional fee:

5.1. LOCAL ONSITE RESPONSE

Local onsite services are available on request and for an additional fee.

After diagnosing an issue via telephone support, if necessary, as determined by Zetron, Zetron will dispatch a Zetron qualified technician to repair or replace equipment.

If a Zetron factory technician must be onsite to resolve the issue, Zetron will coordinate the site visit with the appropriate parties. Factory presence may not be immediate; travel arrangements will be made as resources are available.

Onsite support affected by severe weather or natural disaster will be rescheduled. In the event of severe weather or natural disaster that restricts the local support agency and/or a pre-scheduled Zetron factory technician from using a routine vehicle (airline, rental car, etc.) for travel to the site, both agencies will be relieved of any response time requirement. The onsite support will be rescheduled when conditions warrant use of a routine vehicle.

5.2. SOFTWARE UPGRADE CUSTOMIZATION

Based on the assessment described in Section 4.4, Zetron will provide a quote on any outstanding engineering customization necessary to ensure software upgrades will function as expected on deployed custom systems. This service is available upon request and will be scheduled based on priority; emergencies will be given the highest priority of available resources.

6. ASSUMPTIONS AND CONDITIONS

Zetron assumes, and the prices stated in this MSP are based on, the following:

- The customer has trained technicians on staff available for Zetron's Technical Support team to engage as a first resource for onsite support. If the customer does not provide first tier support themselves, Zetron can identify a subcontractor to act as first tier. This subcontractor may be contracted through Zetron or directly with the customer.
- The customer and/or customer's designated service provider, as applicable, will provide a centralized point-of-contact and an escalation path for Zetron's Technical Support team to obtain approval in a timely manner for any additional onsite support required by Zetron employees.

7. PRICING

7.1. PERIOD OF COVERAGE

The pricing listed in this MSP is based on the MSP being in effect before or upon system cutover. Additional fees may apply if this MSP begins after system cutover.

If customer is elevating the level of service from a lower level to a higher one (such as from Silver MSP to Gold MSP), the price difference between the existing service level and the desired service level shall be determined and prorated over the remaining period of coverage. From that point forward, the pricing for the higher level service will be used.

8. SUMMARY OF SERVICES

The following table summarizes the services provided in this Gold MSP. If there is a conflict between this table and the other terms of this Gold MSP, the other terms of this Gold MSP control. These services are subject to change upon service agreement renewal or extension.

	Gold MSP
Phone support, business hours	X
After hours phone support for critical issues	30-min. callback for critical issues
Advanced Replacement, 1st 90 days	X
Repair defects in material & work	X
Repair turnaround time	2 business days
Refurbished equipment for repair	X
Outgoing shipping costs for repair	X
Software maintenance	X
Software upgrades	X
Software customization assessment [1]	X
Software upgrade customization	Quote
3rd party equipment repair mgmt.	X
Onsite factory services	X
Technical support	X
Technical training	X
Operation training	X
Operation train-the-trainer	X
Preventive hardware maintenance	X
Softw[illegible]upgr[illegible]e supp[illegible]t [1]	X
Local or[illegible]te respo[illegible]se	Quote

[1] Required for Acom software maintenance upgrade releases.

ZETRON USA
PO Box 97004
Redmond, WA
98073-9704
USA

TEL 425 820 6363
FAX 425 820 7031

zetron@zetron.com
WWW.ZETRON.COM

EXHIBIT C:
Sonoma County, Zetron System Description

ZETRON

DRAFT

ACOM System Description

Sonoma County Sheriff's Office
ACOM Console System

ZETRON

Table of Contents

Executive Summary

Zetron is pleased to propose our world class integrated radio dispatch solution, the ACOM console system to Sonoma County Sheriff's Office. This latest generation of ACOM builds off the legacy of performance and reliability that countless mission-critical customers have relied upon for many years, while introducing innovative new features and functionality that will support improved operational efficiencies.

The ACOM console system proposed for Sonoma County Sheriff's Office has enjoyed great success and has been embraced by the public safety industry worldwide. The proposed system for Sonoma County Sheriff's Office is based on the same technology that we have provided to agencies such as Los Angeles County Sheriff & Fire, Los Angeles City Fire, City of Roseville, New York State Police, just to name a few. Zetron has also provided large ACOM systems supporting transportation operations and public utilities such as Pacific Gas & Electric. Zetron's commitment and extensive experience in the specific needs of public safety continues to produce product enhancements that will benefit dispatch operations now and into the future.

The ACOM console system is specifically designed to satisfy the demanding day-to-day operational requirements of public safety agencies such as Sonoma County Sheriff's Office.

There are many operational benefits to Sonoma County Sheriff's Office upgrading your legacy console system in place to a new ACOM Command and Control system, including:

- Removal of obsolete and non-supportable existing system components.
- Superior alarms and remote diagnostic capabilities enabling more effective troubleshooting and maintenance.
- ACOM Surveyor which provides customizable usage reports.
- Instant Recall Recorder fully integrated into the ACOM GUI, accessible via the line/channel icon, or the call queue/stack.
- The ACOM Command and Control platform operates on Linux which provides increased system security and additional protection against malicious attacks.
- Software upgrades are easily managed, less time consuming and less costly.
- Architecture utilizes commercial off the shelf equipment provides more affordable and efficient hardware upgrades and is more supportable for the long term.

Hardware Architecture and Interfaces

The proposed system is based on a redundant dual-core architecture configuration that will be located at Sonoma County Dispatch Center and Sonoma County DR site. The dispatch positions, radio interfaces and SIP Logging elements of the system will be deployed at the County dispatch center, DR site and other remote locations. The Zetron proposal includes implementation and installation support, including project management and system configuration to deploy two ACOM Command and Control cores.

Assumptions:

- 28 x Full Feature Console Positions
- 2 x PC only Console Positions
- Two ACOM system cores (One at the County Dispatch Center, one at County's DR site)
- Each ACOM system core configuration will support 30 x consoles in a back-up scenario
- Pricing includes factory base project management and engineering services, along with onsite support during installation optimization & cutover
- Pricing based on a single procurement and deployment mobilization as a single contiguous project rollout

These systems shall support interfaces for:

1. **Backroom equipment at the Sonoma County Dispatch Center**

- 20 x P25 Digital Fixed Station Interface (DFSI) Talkpaths connections with Advanced Encryption Standard (AES)encryption in the ACOM core
- 32 x 4-wire E&M or TRC Analog Radio Interfaces with MDC-1200 signaling via 16 x dual-homed ACOM Radio Gateways (ARG)
- 50 x 4-wire E&M or TRC Analog Radio Interfaces via 25 x dual-homed ACOM Radio Gateways (ARG)
- 60 x SIP logging recorder outputs

2. **Backroom equipment at the Sonoma County DR Site**

- 20 x P25 Digital Fixed Station Interface (DFSI) Talkpaths connections with Advanced Encryption Standard (AES) encryption in the ACOM core

- 32 x 4-wire E&M or TRC Analog Radio Interfaces with MDC-1200 signaling via 16 x dual-homed ACOM Radio Gateways (ARG) – same as ARGs provided for main dispatch center
- 50 x 4-wire E&M or TRC Analog Radio Interfaces via 25 x dual-homed ACOM Radio Gateways (ARG) – same as ARGs provided for main dispatch center

Operator Positions

A total of 28 x full feature and 2 PC only operator positions are provided as part of the proposal. Each of the full feature operator positions consists of:

- 1 x Windows 10 PC workstation with a 23" widescreen monitor
- 1 x Media Dock XS
- 4 x Zetron ACOM speakers with individual volume controls
- 2 x Headset Jackboxes (dual-prong interface for headset/handset control with dual volume controls).
- 1 x Desktop Microphone with PTT
- 1 x PTT Foot switch
- 1 x ACOM Console Software (ACS) application with a Pro Console license

A total of 2 x PC only operator positions are also provided as part of the proposal. Each of the 2 x PC only console positions consists of:

- 1 x Windows 10 PC workstation
- 1 x ACOM Console Software (ACS) application with a Pro Console license

Zetron's quotation includes the following:

- Project management and system engineering services to support deployment of the ACOM Command and Control server-based architecture at the County Dispatch Center and DR site locations, as well as console positions at County facilities. See drawing package for location and resource details.
- Hardware/software for ACOM surveyor reporting for logging and reporting of dispatch events.
- Hardware/software to provide SIP logger outputs to voice logger (ACOM compatible logging recorder will be provided by others).

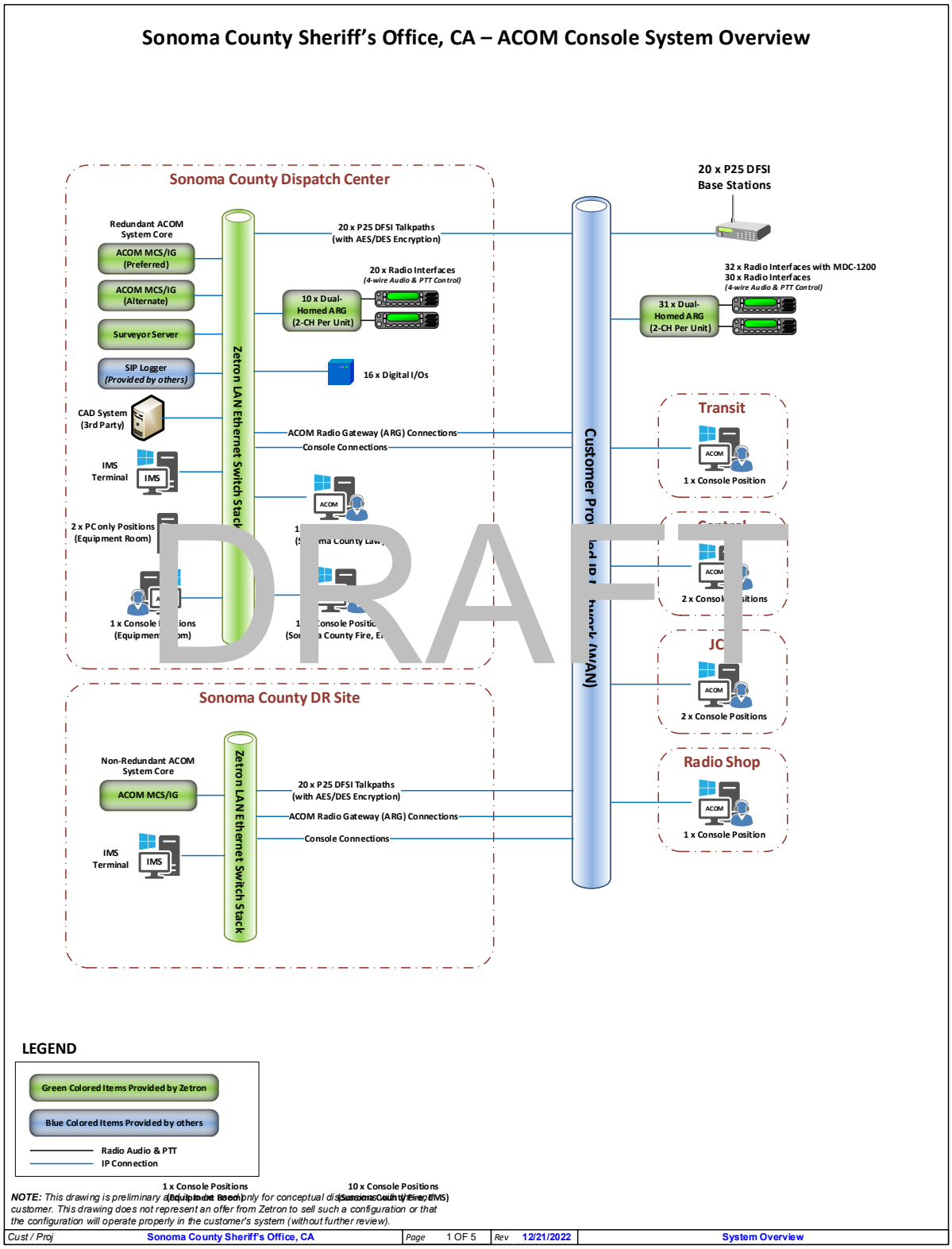
Zetron's proposal does not include the following:

- ACOM Radio Gateway (ARG) 12VDC power
- Headsets with PTT for operators
- Third party hardware or software licensing
- Control station radios, antennas, cabling, installation, configuration, testing, and ongoing maintenance
- All LAN switches for console sites, all LAN cabling/termination/testing, inter-site IP networks, NTP time source

Estimated Schedule

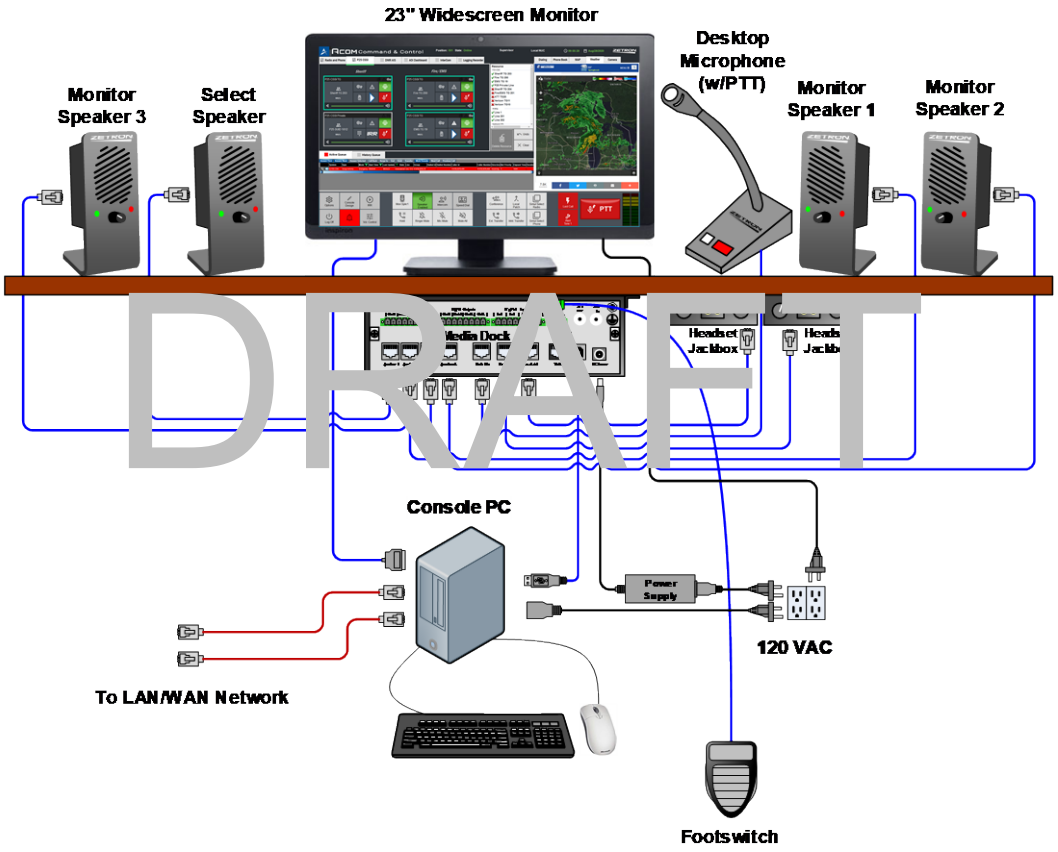
Zetron shall work with Sonoma County on a mutually acceptable deployment schedule to perform the scope of work. There is flexibility regarding performing tasks simultaneously or sequentially. Zetron preliminary estimate of project duration is 6 months from contract execution to project completion.

System Overview



Console Position Layout

Full Feature Console Position Layout

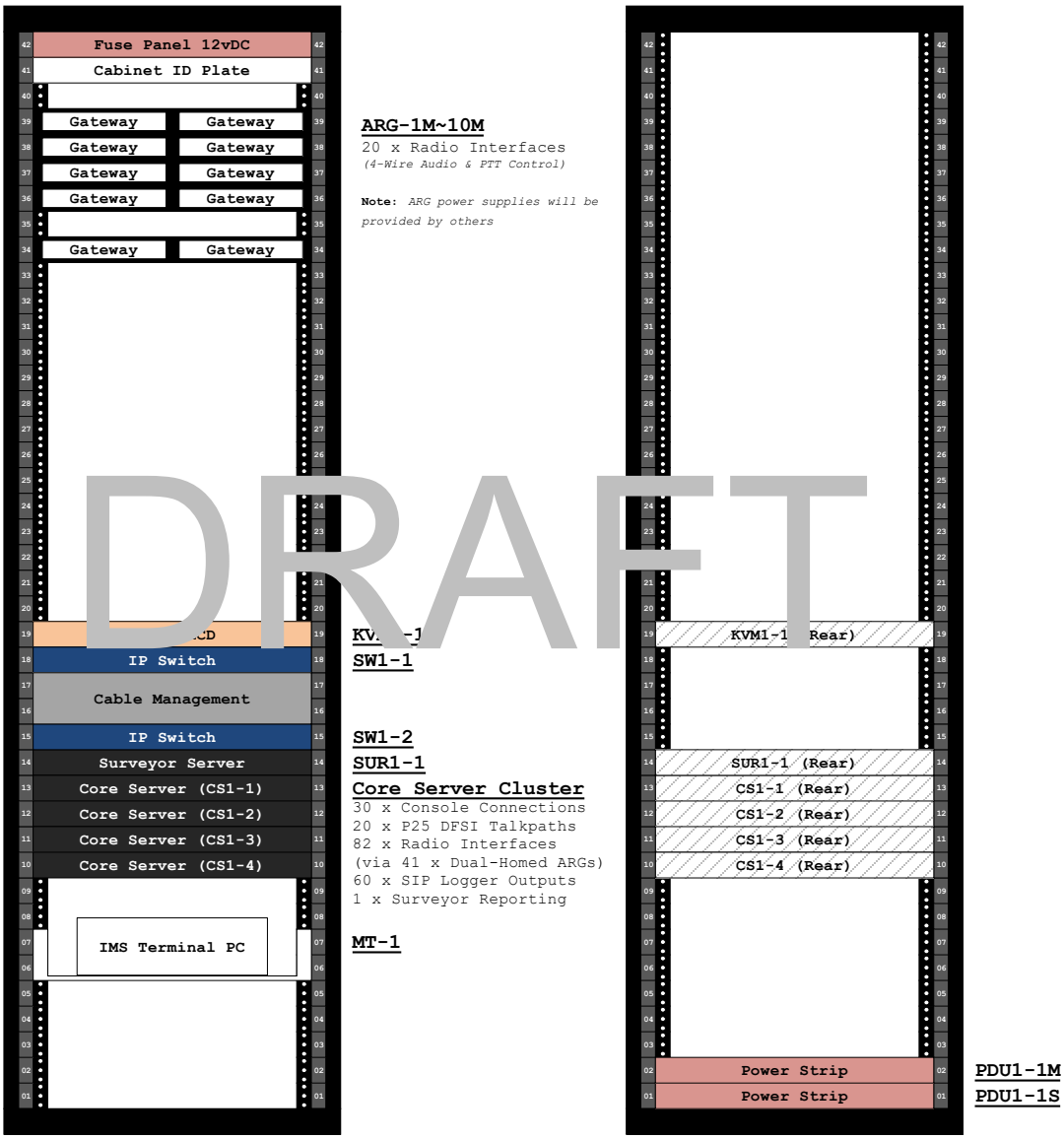


NOTE: This drawing is preliminary and is to be used only for conceptual discussions with the end customer. This drawing does not represent an offer from Zetron to sell such a configuration or that the configuration will operate properly in the customer's system (without further review).

Cust / Proj	Sonoma County Sheriff's Office, CA	Page	2 OF 5	Rev	12/21/2022	Title	Console Position Layout

Backroom Equipment – County Dispatch Center

Cabinet Elevation 1
Backroom



Cabinet 1
(Front)

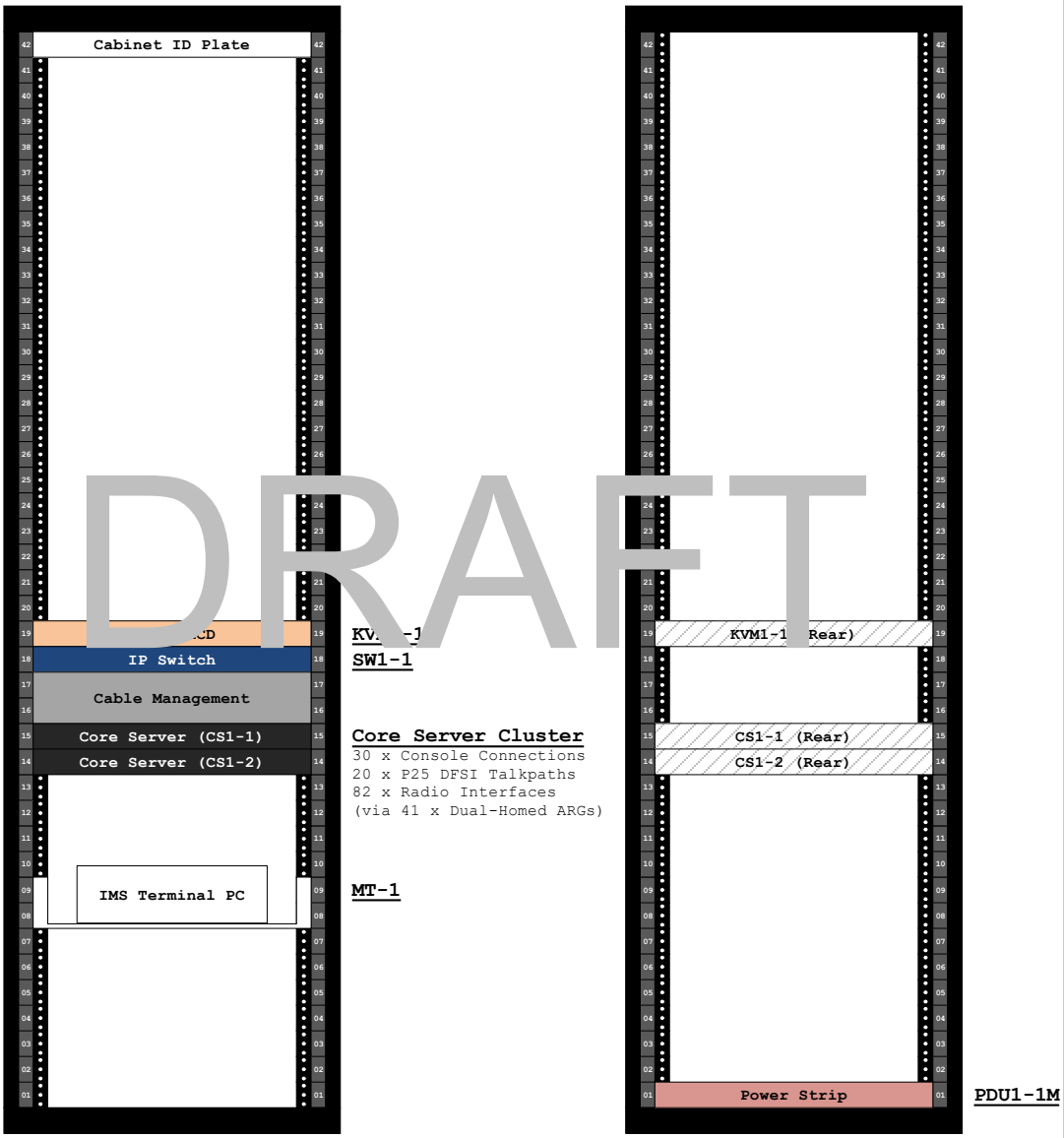
Cabinet 1
(Back)

NOTE: *This drawing is preliminary and is to be used only for conceptual discussions with the end customer. This drawing does not represent an offer from Zetron to sell such a configuration or that the configuration will operate properly in the customer's system (without further review).*

Cust / Proj	Sonoma County Sheriff's Office, CA	Page	3 OF 5	Rev	12/21/2022	Title	Cabinet Elevation 1 – Backroom

Backroom Equipment – County Dispatch DR Site

Cabinet Elevation 1
DR Site Backroom

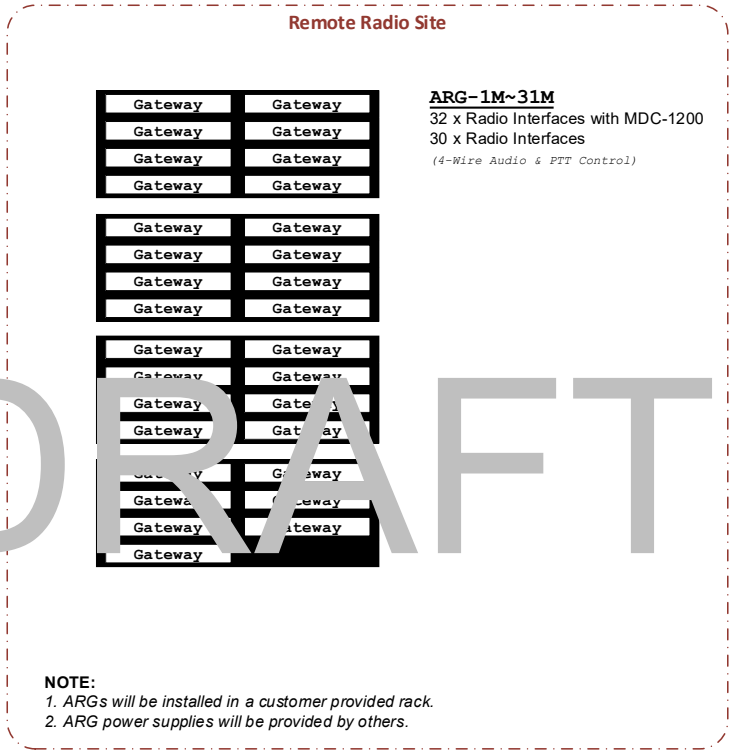


NOTE: *This drawing is preliminary and is to be used only for conceptual discussions with the end customer. This drawing does not represent an offer from Zetron to sell such a configuration or that the configuration will operate properly in the customer's system (without further review).*

Cust / Proj	Sonoma County Sheriff's Office, CA	Page	4 OF 5	Rev	12/21/2022	Title	Cabinet Elevation 1 – DR Site Backroom

Remote Radio Site

Radio Interfaces at Remote Locations



NOTE: *This drawing is preliminary and is to be used only for conceptual discussions with the end customer. This drawing does not represent an offer from Zetron to sell such a configuration or that the configuration will operate properly in the customer's system (without further review).*

Cust / Proj	Sonoma County Sheriff's Office, CA	Page	5 OF 5	Rev	12/21/2022	Title	Remote Radio Interfaces

Pricing Quotation

Please see pricing table included in the proposal statement of work.

ZETRON

ACOM Command & Control

System Description

Introduction to ACOM

The ACOM system is a digital end-to-end IP solution that represents the best value, next generation console dispatch technology for mission-critical applications. ACOM sophisticated digital architecture integrates voice (radio and telephone), I/O and data, to provide unmatched flexibility and ease of use when it comes to resource management, all combined on a scalable server platform core.

Running on top of industry standard IP networks, the ACOM system can provide interfaces and control to both locally connected, as well as geographically remote resources. Using ultra reliable Commercial-Off-The-Shelf (COTS) server technologies running off a Linux operating environment, the ACOM system provides a scalable solution for small to large dispatching needs. In mission-critical settings, ACOM can be configured for local and geographic redundancy, guaranteeing the highest levels of system availabilit[illegible]eliabi[illegible]COM is th[illegible]deal so[illegible]or [illegible]dispatch facilities, consoli[illegible]ating d[illegible]pat[illegible]h facili[illegible]es, cr[illegible]a[illegible]ng bo[illegible]k up or remo[illegible]e dispatch capabilities and [illegible]terfaci[illegible]g t[illegible] and le[illegible]acy [illegible]omm[illegible]nications sy[illegible]tems.

The ACOM cons[illegible]le syst[illegible]m c[illegible]n scal[illegible]eff[illegible]iently f[illegible]m [illegible] single to hu[illegible]dreds of dispatch positions either centrally located or distributed over multiple communication centers. With ACOM, communication centers located in different geographical areas can be networked to provide distributed switching and wide area control for improved efficiency, greater operational effectiveness, and maximum security and reliability.

ACOM Windows-based consoles are highly configurable and offer intuitive, easy-to-use interfaces that can be easily tailored to provide mission-specific functionality.

ACOM guarantees exceptional performance, superior network connectivity, and cost-effective evolution to satisfy the requirements of dispatch communication centers today and into the future. ACOM systems are intended to provide communication capabilities for mission-critical dispatching worldwide, including public safety, aviation, utilities, railway and highway command headquarters, military/defense command centers, and maritime communications centers.

ACOM Technology

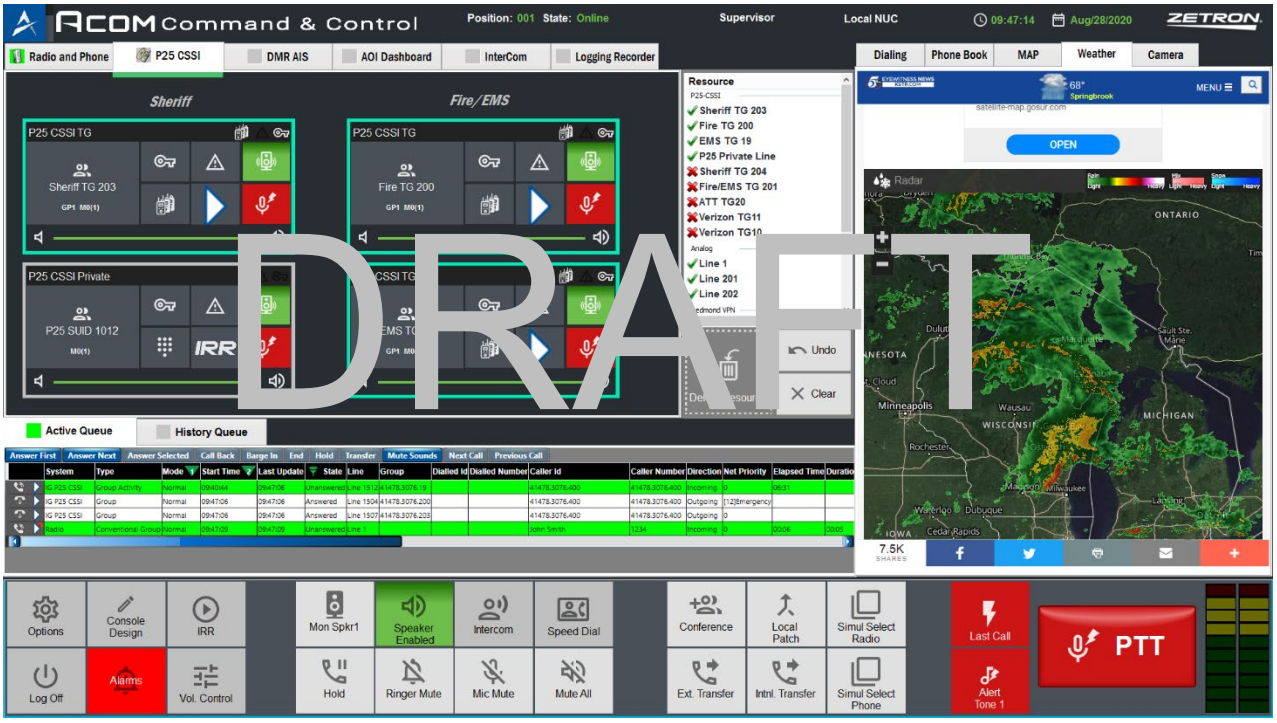
The key elements of the ACOM technology are grouped into four main categories:

Switching Infrastructure

These are the components that manage the transport, routing, and interfacing of all communications resources.

User Interface

Zetron ACOM Dispatch runs on each Windows console PC to provide the command-and-control interface to system resources. A highly flexible design tool is combined with an administrative tool suite to manage the behavior and presentation.



Network Architecture

The ACOM Command and Control system is a completely networked IP solution that provides local and wide area network connectivity that optimizes the method in which network traffic is routed through the network. ACOM is a software centric solution that maximizes the use of commercial-off-the-shelf (COTS) hardware while providing features and functionality through its unique software architecture.

Console media is preconferenced in the system core to reduce the bandwidth requirement to the workstation while providing many channels of independent audio.

System messaging is built on lock-step redundancy between services to ensure the message integrity on a changeover. The standby service has a copy of every message before it is sent out to assume control at any time.

System Architecture

The building blocks that are used to create an ACOM dispatch console system, including the Media Controller Server (MCS), ACOM Console positions, the Zetron Infrastructure Gateway (IG) and any number of other resource interface gateways, operating on a wide range of industry standard interfaces and protocols.

Operator Workload Optimized

With the ACOM technology, the different control functions of a complex, multi-channel communications system are presented in a uniform, convenient, and intuitive manner to ensure maximum operator efficiency and effectiveness. Human interface characteristics are optimized to reduce operator workload and provide functions specific to a user's functional domain.

- PC-based operator positions provide full-color, graphical presentation of commands and controls that are familiar, precise, and easy to use.
- Features and parameters are fully user programmable to allow customization, modifications, and changes by appropriate personnel.
- Functions are controlled by touch screen, keyboard/keypad, standard mouse, or trackball. A full range of peripherals assists the operator in handling multiple sources of inputs and outputs.
- Active conversation lamps indicate console activity and state.
- Interest in system resources can be updated using real-time drag-n-drop or queue subscriptions.

System Architecture

The flexibility, expandability, and scalability of the ACOM system architecture are among its greatest strengths. ACOM systems are created from the core building blocks of its technologies to provide virtually any system capacity, functionality, and configuration required. In addition to the Media Controller core, these building blocks include the ACOM Console Position, Resource Gateways, and the interfaces and protocols that allow ACOM to communicate with a wide range of communications devices and systems.

Media Controller Services

The ACOM system is first and foremost an integrated digital platform that allows operators access to voice and data circuits in the system (subject of course to administrative control).

The Media Controller Server is the building block of the ACOM platform. Its primary function is to manage and control the connections between console positions and resources available to the system in an efficient and information rich manner. The MCS operates on commercially available servers. Depending on operational needs the MCS can provide redundant fault tolerant configurations for mission critical operation. These servers can be sized based on system console loading requirements, such as the number of consoles in the system, and user reliability and availability needs. IP connections are established to consoles and resource gateways. Software applications within the server perform management of connections, building and management of call paths, and management and configuration of the server itself.

Typical Software Applications within a Controller:

Console Communications

The console communication software manages the communication and features of connected ACOM consoles. While operating in fault tolerant redundant configurations, the applications communicate with the primary and secondary Ethernet connections to the console.

Resource Communications

The console resource communication software (Console Portal) manages and controls communication with resources connected to the console. It is responsible for maintaining link synchronization with resource gateways and controlling when a requested resource is routed to a console position.

Media Controller Function

The Media Controllers are also responsible for building and binding communication paths between consoles and resources. This binding may also occur when inter-console communication occurs between dispatchers. The MCS builds links when requested and handles any arbitration that may occur.

System Management

System management handles the configuration and management of the MCS. This is accomplished via an external web browser operating on an external client PC. The MCS contains its own internal web server that facilities this communication. The web

service operates a repository of configuration supplements used by consoles and gateways to make the initial connection.

Infrastructure Gateways (IG)

Infrastructure Gateways manage external resources and allow the protocols and interfaces used by these devices to be converted to the common ACOM communication and control protocol. Depending on the resource type, the gateway may operate on a server platform, or it may utilize more customized hardware designed to connect to a specific resource type. Multiple interface types can be supported on an IG, provided server loading and processing limits are followed.

P25 Digital Fixed Station Interface (DFSI)

Communication with Project 25 (P25) conventional base stations is accomplished through the industry standard P25 DFSI interface. The DFSI gateway operates on the ACOM server hardware. The specification provides for different voice communication call types, the ability for the dispatcher to control radios, and both clear (unencrypted) and secure (encrypted) communication between radio users and the ACOM system.

P25 Console Sub System Interface (CSSI)

Communication with Project 25 (P25) trunked system is accomplished through the industry standard P25 CSSI interface. The CSSI gateway operates on server hardware. The ACOM solution implements the CSSI per applicable P25 standards that allow radio systems from various vendors to interface with the ACOM console system. The specification provides for different voice communication call types, the ability for the dispatcher to control radios, and both clear (unencrypted) and secure (encrypted) communication between radio users and the ACOM system. The P25CSSI interface is also used to communicate with FirstNet and other Broadband PTT services.

DMR Application Interface Specification (AIS) Interface

Interface into a Tier III (trunked) DMR System is supported by the Application Interface Specification (AIS) as a direct IP connection to the ACOM Infrastructure Gateway (IG). Many DMR Radio System vendors support the DMR AIS standard. Zetron regularly tests with several of these vendors to ensure AIS feature support; Zetron DMR test results are available upon request. The current Zetron DMR AIS feature support is included in the attached "ACOM DMR Feature Capabilities" document. Continuous evolution of the DMR AIS feature set is fully supported by Zetron, and Zetron is very active in the various AIS standards committees. The AIS interface is also used to host ESChat interoperability with cellular subscribers (PTToC).

ACOM Radio Gateways (ARG)

The ACOM Radio Gateway (ARG) is used to connect radio resources to the MCS through an IP network. They convert audio and control data into IP packets and vice versa, enabling the data to pass back and forth between the radios and dispatcher positions. Each ACOM Radio Gateway manages up to two channels of local, tone, or direct radio control.

Interfaces and Protocols

Sophisticated resource management software ensures seamless interconnection and communication of radio, telephone, and data channels as well as other specialized services and equipment. A powerful range of interfaces to third party equipment and systems provides the foundation for building a highly integrated and resilient system.

The ACOM system supports a wide array of wireless interfaces, telephony, and data protocols, including:

Data Protocols

- Ethernet
- RS232/4[illegible]/485
- NTP
- SNMP
- MDC

Paging Protocols

- Q[illegible]ck Call II
- D[illegible]l-tone multi-frequency (D[illegible]MF) using (FSK-NRZ)
- K[illegible]xDTMF
- AV[illegible]all2+2

Signaling Protocols

- Tone remote control
- VoIP
- 5/6tone SELCAL
- 2tone Paging
- DTMF *# keying and detection
- VOX detect and AGC
- MDC1200

Radio Interfaces

- Project 25 (CSSI, DFSI)
- Conventional 2w/4w
- DMR AIS
- NEXEDGE type C
- PTTo Cellular
- TaitNet Dispatcher Interface Protocol (DIP) MPT1327
- OpenSky
- TETRA, IP and wireless
- Motorola V.24 Quantar
- Control station wireless access (Motorola, Harris, EFJ, Kenwood)
- Motorola VRC (MotoTRBO)

Telephony Protocols

- SIP
- E1/T1 CAS
- 2-and 4-wire E&M
- E1/T1 ISDN PRI
- FXO POTS
- FXS Ringdown

ACOM Console Position

Console Position Type	Position Capabilities
Feature Mode Console Positions	This is a console position built on a COTS PC platform with Zetron provided interface and audio processing equipment. A feature mode console provides the full range of features and functionality to dispatch operators
Mobility Console Position	A Mobility console position is an ACOM console running on a laptop or tablet computer. It can reside almost anywhere providing an IP network connection can be established between the mobile console and the ACOM core network. A mobile console position does not require the Zetron specific audio and interface hardware. It can be operated with a simple USB Microphone / Headset. Because no external hardware is required the console is limited to only two speakers
Supervisor Position	A supervisor position provides additional capabilities not found in a Feature Mode or Remote console position. These extra features are provided through software programming. Accessing supervisor features is provided to user having proper permission levels at login. Because these capabilities are provided by software any position can be used as a supervisor position based on proper user permission.

Feature Mode Console Positions

ACOM console workstations are used by dispatch operators, call takers, and/or supervisors to provide direct communications, patching, conferencing, signaling (e.g. paging), and messaging to the field resources under their command and control. Each ACOM workstation consists of a PC running Microsoft Windows OS and a flat panel LED or LCD monitor. Monitors may be fitted with capacitive touchscreen technology that ensures problem free operation for the life of the monitor and allows the console to be operated without the need for a pointing device.

The console has two modes of operation to which it can be configured: featured or mobility. In the Feature mode a Zetron Media Dock is connected via a USB interface. The Media Dock provides connectivity for all peripheral devices that allow the dispatch operator to effectively interact with the field resources.

These devices include:

- Footswitch and local I/O that can be used to activate functions on the console or can be used to drive lamp towers at the console desk to indicate the status of the operator/console.
- Keyboard function keys can be used to invoke console functions from a standard or compact keypad.
- TRHI port to connect a NENA telephony to utilize the same headset.
- 600ohm Auxiliary Audio I/O for a local Utility Audio source or to output console select audio.
- Desk Microphone with integrated PTT and aux function

While the Media Dock XS brings the console interfaces into the digital domain, it is the ACOM VoIP Controller service and its script-based audio routing engine that provide audio logic choices without custom development. The system places the audio routing into a scripting engine that allows custom audio-routing profiles to be loaded dynamically into the Media Dock based on the login. As a result, any audio input can be directed to any audio output or have audio levels automatically adjusted based on the operator's console profile. This means each deployment's audio switching requirements can be met through system configuration rather than hard coding.

Mobility Console Positions

By removing the media dock from a position, a console can be operated in a more mobile fashion. This mode allows a console to be operated on either a laptop or Windows tablet. Typical applications of this configuration could be deployment in mobile command or temporary dispatch operations. This configuration only offers a single audio routing option, due to the removal of the media dock. A remote console can be made functional by providing an IP connection and a USB connected headset or using a laptops build-in speakers and microphone. A console operating in this environment will still provide the user with the full console feature set the system has to offer.

Supervisor Console Positions

ACOM provides advanced functionality that can be implemented at any console but is usually reserved for use by shift leads or supervisors. These features include:

- Acknowledging system alarms - clicking an alarm button displays an alarm log window, which shows information about active alarms. If an alarm is active, it can be acknowledged by performing an alarm acknowledgement. This action does not clear the alarm, it merely lets the system know that someone is aware that the alarm is active so it can be processed and resolved.
- Intruding on an operator's call - intruding on a console allows the supervisor to coach the console operator while listening in to their calls. The intruded console and the intruding console can communicate openly, the intruding (supervisor) console can hear all the console operator's calls but cannot be heard by any of them.
- Overriding an operator's PTT - this feature enables a PTT from the supervisor's console to override an operator's PTT. This allows the supervisors to interrupt calls and take control of a channel.
- Radio disable - this feature allows a console operator to stun or revive a mobile radio from a console position.
- Force logoff – supervisors can force another console offline.
- Interest management reports and alarming for console dynamic interest in resources can be managed and acted upon. This ensures coverage when dispatchers are permitted to modify their lines or queues ad-hoc. Minimum selection alarms can sound when lines have no listening consoles.

ACOM Console Positions Configuration Overview

ACOM provides user flexibility in how console positions are used and configured. And provides three different dispatch position configurations intended to address user needs. The configuration provided full feature operation, mobility, and advanced dispatcher capabilities.

Dynamic Resource Management

ACOM gives dispatchers dynamic control over the radio and telephone resources that appear on their screen. Through a simple drag-and-drop procedure or by selecting a button, dispatchers can add or remove telephone and radio resources to or from their screens as the situation demands. As a result, consoles can be modified quickly and easily in response to unexpected incidents, emergencies and dispatchers' changing needs.

ACOM Call Stacks

Call Stacks are interactive lists of calls which are filtered, sorted, and color coded based on specified criteria. They can be created to manage radio, intercom, and phone calls. It is a filtered view of the global call system in the ACOM system that records all phone, radio, and intercom activity. Interacting with a Call Stack can be done with a mouse or dedicated buttons. Call Stacks are updated automatically showing activity and status of assigned calls.

Through Call Stacks you can answer, acknowledge, end, or initiate call back to a radio unit or phone number associated with the call. Data calls can also be documented and acknowledged through the Call Stack. The Call Stack serves as an interactive record of sent and received console calls.

The call stack can be configured to display only information deemed important to users about a call. Information displayed can be labeled according to a user's preference. The presentation of information is based on configurable parameters:

Filter:	used to specify which calls should be displayed in a stack
Sort:	calls can be sorted by information in any Call Stack data column
Color Display:	information can be color coded based on a calls attribute status
Sound:	the sound can be generated once an interval

Areas of Interest

Areas of Interest (AOI) feature enables the operator to dynamically change the phone queues and roles that ring during operation without having to log out and load a different user profile or a different operator position layout. Phone calls are placed into roles/queues based on the called or calling number. With 2500 queues available each phone number could have its own or they can be grouped for simple management.

During design of the user profile these buttons are configured for where they should appear as well as the roles and overflow roles that are joined when they are activated.

Trunked phone calls: operator is presented with a call stack representing its selected Areas of Interest and can choose in which order to answer calls.

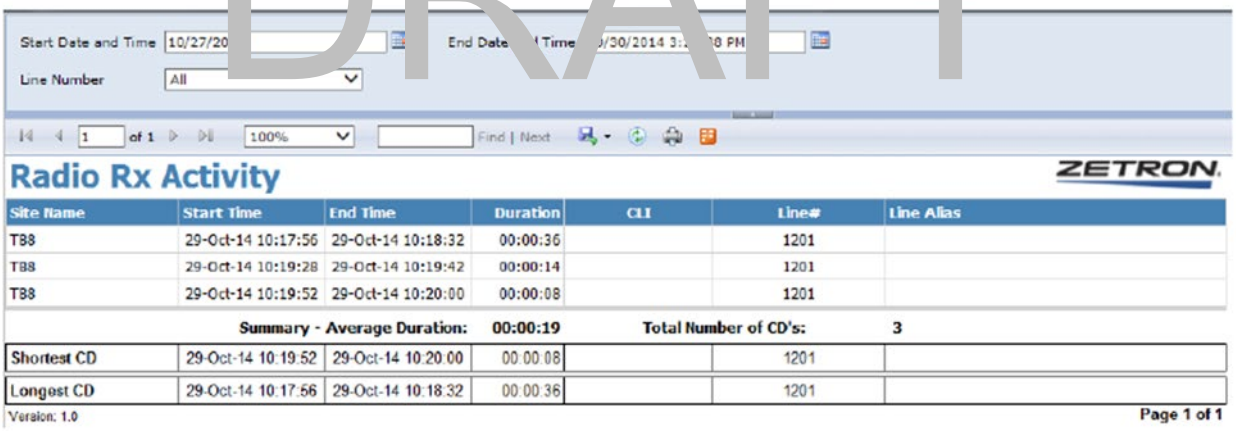
Key attributes of this ACOM Area of Interest feature are:

- Areas of Interest supports change among sets of roles and overflow roles. Calls reach overflow after a timed period or when there are no free dispatchers.
- There is no restriction in the number of Areas of Interest assigned to a single console user.

- There is no restriction on the number of operator positions assigned to a single Area of Interest (unless a minimum number of users is configured).
- An alarm is triggered if a communication resource is not currently in anyone's AOI; for example, this may occur due to user logoff, workstation failure or manual toggling of an AOI button.
- If a call remains unanswered past a configurable time, it diverts it to all other users assigned to the appropriate overflow role and it is identifiable on their screens as an overflow call.
- A walk-away button enables an operator to clear out of all roles (for example to perform other work).
- Console availability is presented in the consoles list view control.

ACOM Information Management System – Surveyor

Surveyor logs alarms, operator events, and call detail records into a database and provides real-time views in addition to an extensible reporting engine to review the data. Surveyor is a Windows service that collects event data from the ACOM system and stores the collected alarm and MIS data into a SQL Server database. Surveyor hosts a web configuration page for managing the connections as well as accessing web reports.


Start Date and Time 10/27/20 End Date Time 10/30/2014 3: PM
Line Number All
1 of 1 100% Find | Next

Radio Rx Activity ZETRON

Site Name	Start Time	End Time	Duration	CLI	Line#	Line Alias
T88	29-Oct-14 10:17:56	29-Oct-14 10:18:32	00:00:36		1201	
T88	29-Oct-14 10:19:28	29-Oct-14 10:19:42	00:00:14		1201	
T88	29-Oct-14 10:19:52	29-Oct-14 10:20:00	00:00:08		1201	
	Summary - Average Duration:		00:00:19	Total Number of CD's:	3	
Shortest CD	29-Oct-14 10:19:52	29-Oct-14 10:20:00	00:00:08		1201	
Longest CD	29-Oct-14 10:17:56	29-Oct-14 10:18:32	00:00:36		1201	

Version: 1.0 Page 1 of 1

Surveyor connects into the ACOM system over the IP network. Through this interface it collects fault data and call detail data as they occur. Multiple collection points can be provided. This provides redundancy to continue collecting data in the case of a system fault.

When redundant collection points are in place, events are collected simultaneously, and duplicates are discarded. Surveyor processes the data and writes records to a SQL Server database. MS SQL Server has a rich feature-set beyond Surveyor that IT groups may appreciate. The database can be queried to generate reports based on user-specified parameters. The database may be on the same machine as Surveyor or another that can be reached via IP. Data base management can be an automated

process to prevent filling the hard drive. Ad-hoc purges may also be performed from the Surveyor web interface.

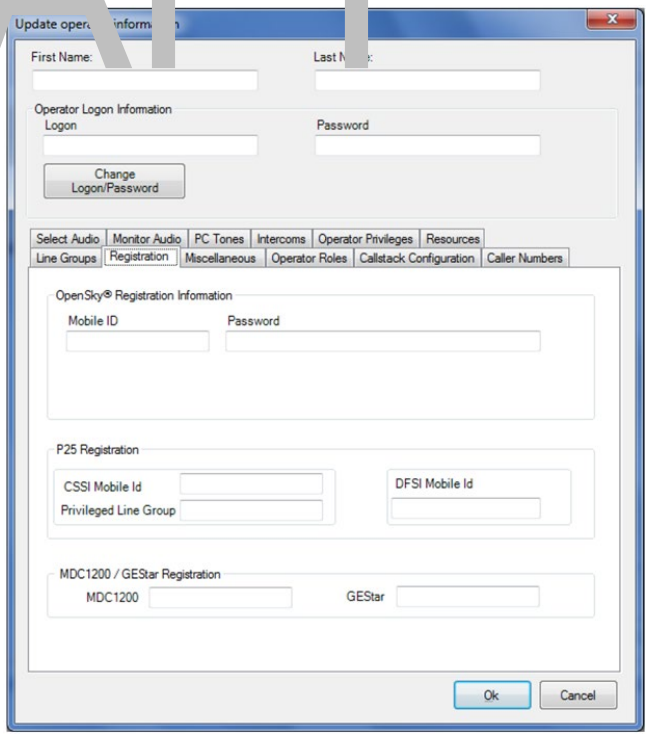
Beyond the real-time alarm and console status, Surveyor provides some reports for querying long term system activity. Reports are written in the Report Definition Language, an open format for defining the presentation of report data. A suite of reports is included in the Surveyor installation, and further user-created reports could be added using the MSRS Business Intelligence tools and MS Reporting Services web tool provided with MS SQL Server.

Surveyor can reach out to other ACOM data sources to collect metadata to be used with the reports. ACOM Profile Manager and ACOM Entity Manager alias data is used, if available, to enhance the reports. With monitoring of these external data sources, new reports will always have the most current aliasing metadata.

User Profile Management

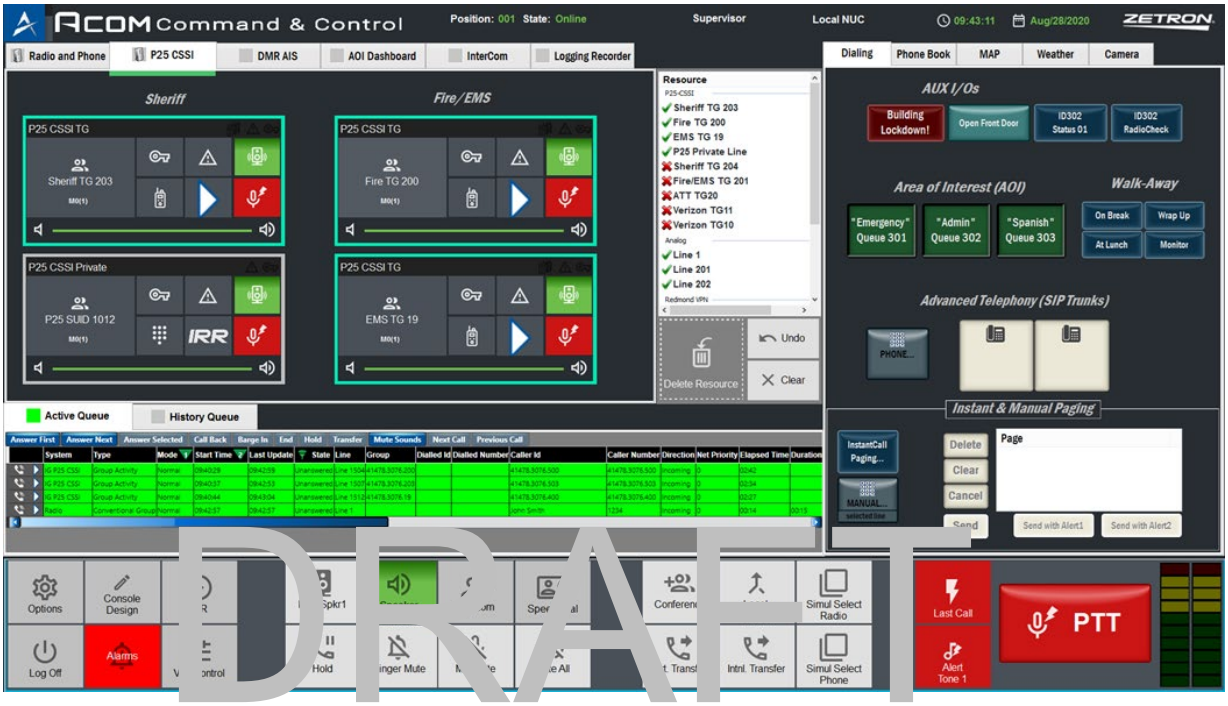
With ACOM profile-based logins, administrators can configure the system to display specific functions, allow access or provide certain screen layouts according to user's profile. Log-in capabilities range from basic-user screen startup to full, authenticated log-in control.

Any number of screen configurations can be created and assigned to any position. For example, configurations can be created based on resource needs: dispatch functions to be performed, duty shifts, shift management, supervisory and maintenance roles, and training exercise simulations. "Location-based resource" configurations can be created using icons overlaying graphical bitmaps to indicate the locations of communications resources such as radios and telephones in the customer's network or console intercom. Configurations can be assigned to an operator automatically depending on his or her log-on profile, they can be modified "on the fly" as circumstances warrant (with appropriate authorization), and they can be created, published, and activated by supervisory personnel using network management resources.



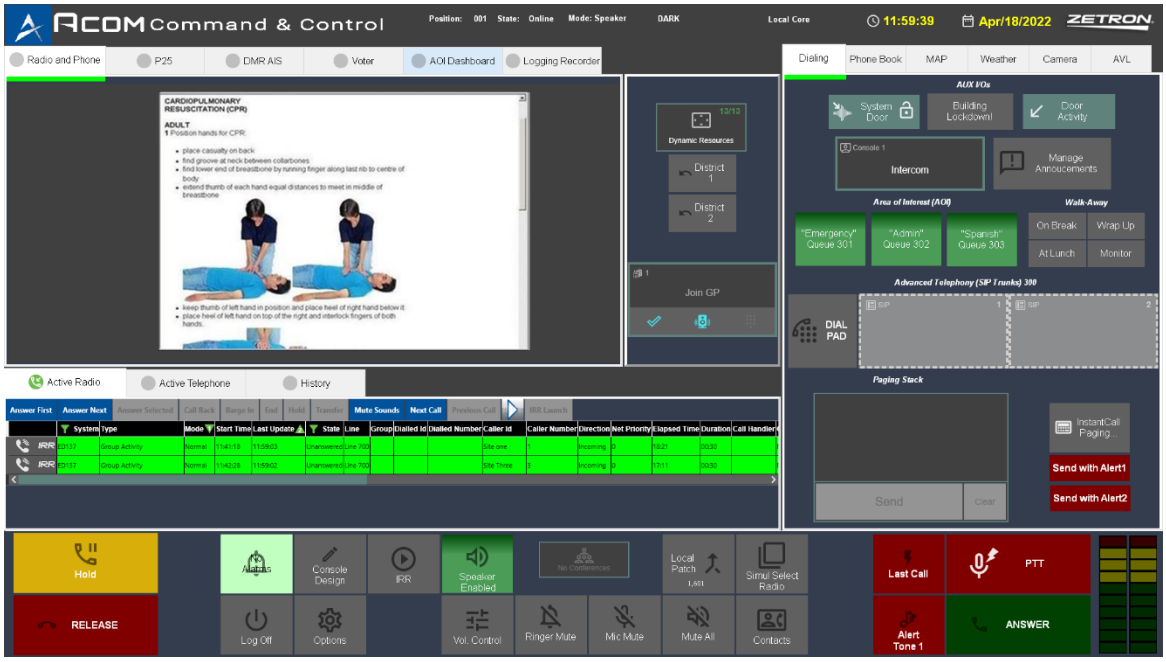
Button Based ACOM Screen

The ACOM Console Software (ACS) application adopts an "any function, any size, any resource, any appearance, any location" paradigm for designing and configuring a console interface screen. Below is an example screen configuration utilizing a traditional "button" based configuration.



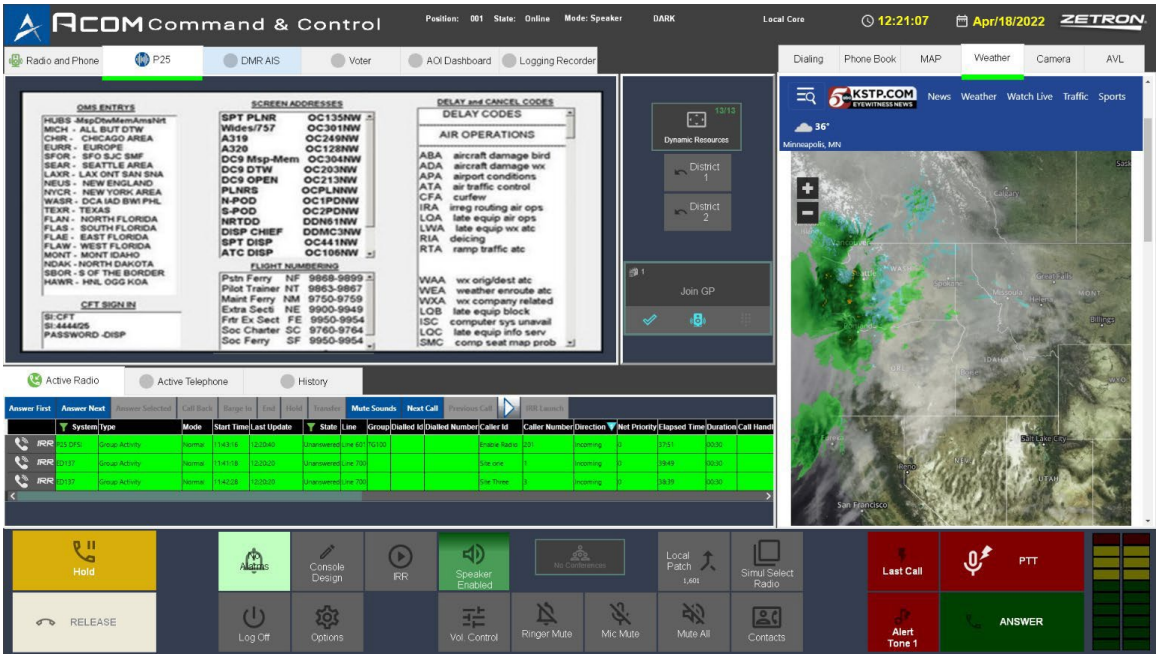
Embedded Browser in ACOM Screen

A browser can be embedded in the dispatch screen which allows an operator to reference HTML or PDF based documentation such as first-aid information, map images, webcams, manuals, maintenance logs or standard operating procedures. The information presented by these HTML or PDF files can be developed by the customer to match existing procedures and documentation. If the files created have hyperlinks, the operator can browse these at the console position while answering calls, transmitting on radio channels, or releasing access doors. The great advantage to having this information available in an online format is that it can be centrally updated to ensure all operators are working from the most current information resources. If the hyperlinks are for a telephone directory and the number is stored, the operator can click the hyperlink and generate an outgoing telephone call using an outbound trunk group. These files can be centrally held on a closed LAN network or stored directly on the console PC.



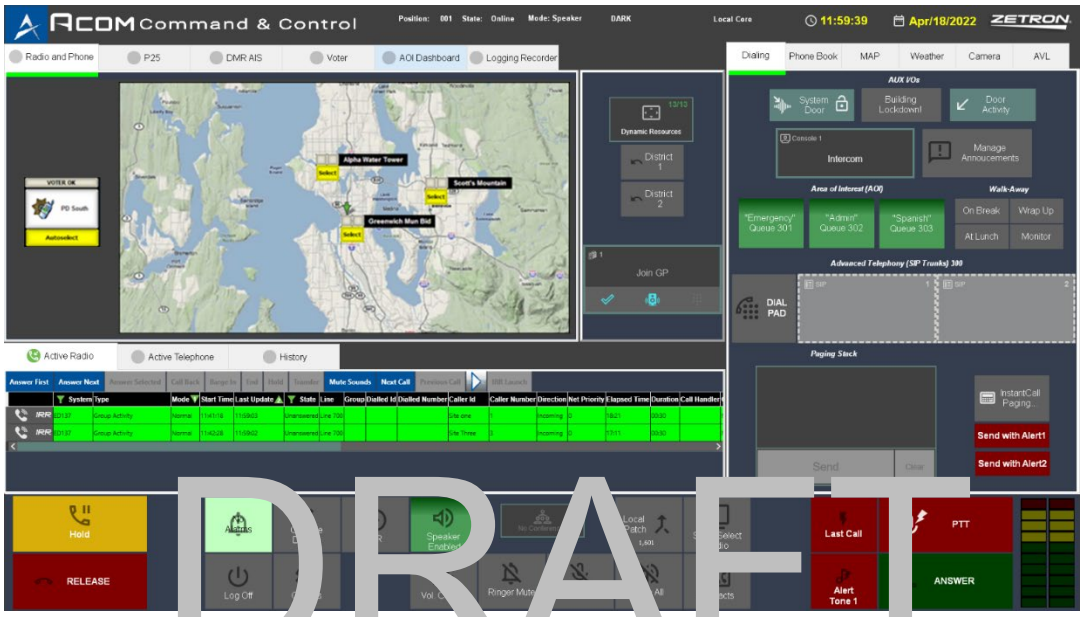
Text Lists or Free Form Text in ACOM Screen

ACOM can show an application using either text lists, or just free form text on a console tab within the ACOM operator screen. This avoids operators using hand-written post-it notes stuck to the console for supplemental information. This information can then be centrally updated so all operators are working from the most current information resources.



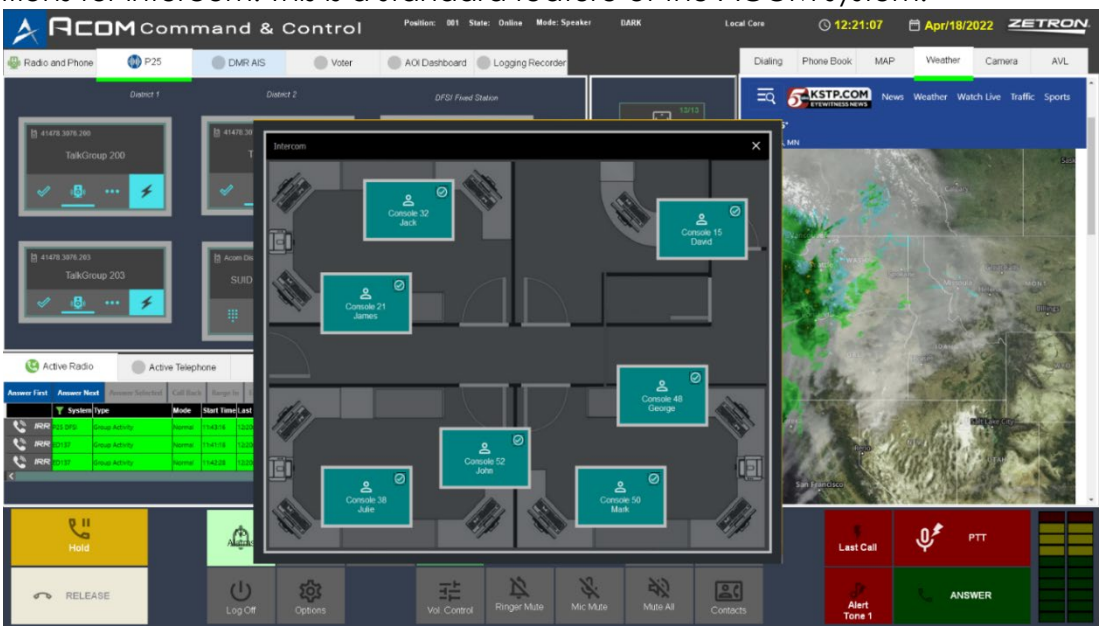
“Location-Based Resource” ACOM Screen

Resources are mapped using a location-based screen configuration that can be created using icons overlaying graphical bitmaps to indicate locations of communication resources such as radios telephones and consoles in the ACOM network. A dispatcher can select the location of a communications resource rather than just a labeled icon. Configurations can be assigned to an operator automatically depending on his or her log-on profile.



Graphic Based COM Screen

Other ACOM console positions can be shown in a “location-based resource” screen configuration that is created using icons overlaying graphical bitmaps to indicate the positions for intercom. This is a standard feature of the ACOM system.



ACOM Console Design Software (CDS)

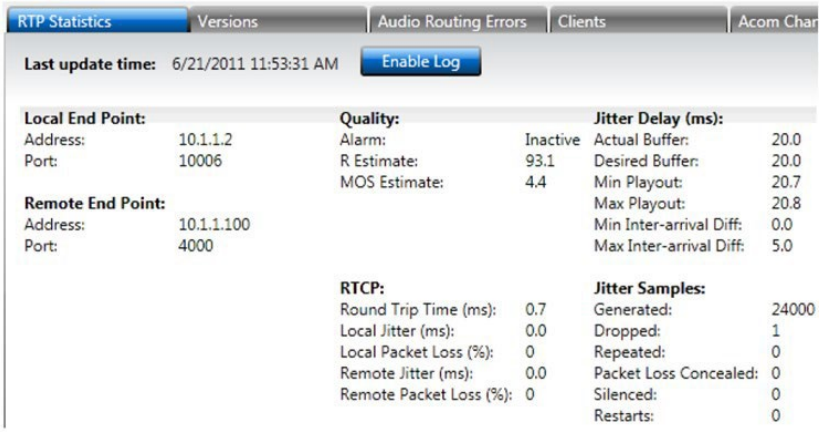
The ACOM Console user interface allows for flexible design and configuration of console interface screens. "Drag and drop" design tools are used to create the console screens and to assign system resources to buttons and other screen elements.

ACOM screen configurations are created using ACOM Console Design Software (CDS), a Windows-based application that provides all the graphical design tools and editing functions needed to fashion user interfaces for the ACOM Console Screen. CDS provides a simple, highly intuitive interface that allows screen configurations to be created and edited quickly. Through CDS, ACOM provides a wide range of functionality and capabilities, with screen layouts that provide icons/keys for accessing all communication resources, function controls, calling queues, information display areas, and user databases (e.g., telephone directories, one-touch dialing and pre-programmed paging lists, alarm logs, etc.). Screens can be configured with a variety of user tools such as list boxes, resource-based graphics, tabbed windows, and browsers.

ACOM Management Tools

The ACOM Console Manager application offers a built in IP diagnostics tool to determine if the connected IP network is running as expected. Integrated alarm and reporting management tools can be configured to either link to external contacts or provide a Simple Network Management Protocol (SNMP) trap. This greatly simplifies system error diagnosis and system maintenance. The ACOM solution also has a comprehensive data storage and reporting package known as Surveyor, that collects call and alarm messages from the system and allows a variety of web-based reports to be generated quickly and easily.

This helps managers monitor the system and dispatcher performance and helps detect and diagnose potential issues. These built-in IP-diagnostic tools and system-management capabilities help keep the ACOM system running optimally for the life of the system.



.